Communications in Africa, 1880–1939

Railways: Proposals

Edited by David Sunderland
Britain and Africa Series

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COMMUNICATIONS IN AFRICA, 1880–1939

General Editor
David Sunderland

Advisory Editor
Godfrey N. Uzoigwe

Volume 1
Railways: Proposals
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THese works, however, could not be built at the start of the colonial period. The cost was generally beyond the capacity of the private sector, there was the fear that private ownership would lead to the development of monopolies, whose high freight rates would act against growth, and the London money market would only invest in such projects if they were assured that their capital would be safe from ‘native’ attack and provide a return sufficient to meet interest/repayment charges. The start of the railway age was thus delayed, except in prosperous South Africa, until the late nineteenth century when it was clear that the productive wealth of the continent was sufficient to support railway and harbour investment, Britain’s control of the continent had been formalized and there existed administrations that could recruit the labourers needed to construct works, manage their operation and militarily protect them. By the
First World War, the majority of the trunk lines had been laid down. Feeder and branch railways and works to eliminate trans-shipments were then built to 1931 when the world slump and the collapse of African commodity prices brought the construction phase to an end.

As regards the other forms of transport/communications that appeared in this period, the popular media (newspapers, movies and radio) was developed by the private sector. Apart from the issue of broadcasting licences and some modest attempts at film censorship, the imperial/colonial governments had little involvement in the area. This was not the case with roads, the telegraph and aviation. Of the three sectors, telegraphy was considered most important. Heavily subsidized by the imperial government, the laying of telegraphic cable allowed information to be transmitted from Africa to Britain in minutes rather than weeks and thus permitted better control and defence of the empire and promoted the expansion of trade. By the First World War, most of Africa was linked to Europe and railway telegraphs and other cabling operations ensured good communications within and between colonies/protectorates. Roads and aviation, by contrast, were given a lower priority. The fragility and small carrying capacity of vehicles and the poor quality of routes made road transportation less economically viable than railways for both the short and long distance carriage of goods. Administrations also regarded roads as unwanted competition to railroads, which would damage government receipts, and lacked the funds necessary for their construction and maintenance. Relatively few thoroughfares were therefore constructed until after the First World War when the arrival of large sturdy American lorries and tarmac made them cost-effective for the transport of goods to and from the railhead. Aviation was similarly neglected. Its high costs and small carrying capacities made it unsuitable for the transport of passengers or cargo, apart from mail, and, by the end of the period, although the continent was connected to the major European cities, the service provided was limited and there were few inter-African air routes.

This General Introduction, the thematic introductions and the collection sources examine the communications revolution experienced by British Africa over the period 1880 to 1939 and the impact it had on economic growth, urban geography and the African way of life. After a brief discussion of two traditional forms of transport, porters and animal drawn wagons (waterborne transport is discussed in the Canoes and Boats thematic introduction of Volume 5), this General Introduction explores the State construction of railways, concentrating on the use by colonial administrations of the department system, contractors and their own Public Works departments and the finance of lines. Private sector construction, the use of consulting engineers and contractors, and the methods by which building materials and rolling stock were purchased are then examined (other aspects of railway construction/operation are discussed in the Proposals,
General Introduction

Construction, Operation of Lines and Economic Impact thematic introductions in the first four volumes of the collection.

The Introduction then explores other forms of infrastructure/communications – the development of harbours, the arrival of the road and motor vehicles, the laying of telegraph cables and the popular media. The shipment of cargo to and from Africa, aviation and the postal services are discussed respectively in the Shipping, Air Transport and Postal Communication thematic introductions, all of which are in the fifth volume of the collection. I conclude with a brief examination of the impact of the communications revolution on African well-being and post-colonial growth.

Traditional Forms of Communication

Traditionally, goods were transported by human carriers, pack animals and by canoe and boat. Porters carried a great variety of goods, usually individually, but in the case of large items as wagon dragging teams, and worked for Arab, Swahili and Indian caravan owners and colonial administrations.\(^2\) The caravans were generally quite large, occasionally stretching several miles, often stopped at towns and villages en-route to buy foodstuffs and to sell their goods, and were accompanied by armed guards to protect the convoys from raids.\(^3\) It used to be thought that most caravan porters were slaves hired from their masters, who received up to 75 per cent of their income. Many, however, now believe that the majority were free labourers. Most stayed in the profession for many years travelling along the coast, and, to a lesser extent, into the interior where they developed their own unique lifestyles.\(^4\) Those employed by colonial administrations, by comparison, tended to be local Africans, though labour shortages caused some governments to obtain workers from further afield. Nyasaland, for example, recruited men, women and children from Mozambique. Often forced into providing their labour, most government porters undertook the work for only a short period of time.\(^5\)

The main drawbacks of human porterage were that it was costly, slow, unreliable and had a negative impact on local economies. Transport costs at around 3s per ton/mile were from three to thirty times that of railways.\(^6\) Facing competition from other economic sectors in need of labour, and, in some cases, restrictions from local governments, caravan owners had to pay high wages, in West Africa from 9d to 1s per day, and suffered high desertion and mortality levels. To reduce their costs, most provided their workers with inadequate food and blankets, forced them to carry excessive loads and to walk long distances without a break, and all carriers were prone to communicable diseases and animal attack.\(^7\) Many thus died en-route or became so sick that they had to be abandoned or sent home. Goods, needless to say, could only be transported as fast as a human
could walk – a great disadvantage if they were perishable – and were often delivered late or not at all, with many deserters absconding with their loads. The system also damaged local economies, contributing to labour shortages and high African wage rates, spreading disease, and, in Nyasaland, where large numbers of migrants were recruited, aggravating food shortages. Nonetheless, the mode of transport proved highly resilient and survived well into the railway age. Before the arrival of roads and motor vehicles, porters were needed to transport goods to and from the nearest railhead and to carry the wood and water required by locomotives. In 1900, there were 78,000 porters in Nyasaland alone, and, in the First World War, East Africa employed over one million.

Animal transport possessed similar drawbacks. In most of Africa, draught animals were rarely used for the movement of goods. The animals were susceptible to draught and disease, the rinderpest epidemic at the turn of the century killing large numbers of oxen, and progress was slow and unreliable. Oxen need to graze for eight hours per day and rest for eight hours, and, in the remaining eight hours, an ox wagon could only travel ten to eighteen miles, depending on the state of the roads and the country traversed. Often journeys took far longer. Axles and wheels broke and could take days to repair, during the rainy season some roads became impassable, and oxen could fall prey to lions and crocodiles and be slowed by swarms of tsetse flies. The exception was South Africa, where ox wagons were the preferred method of carrying supplies. The wagons used could be as long as 18’ by 6’, carried around a ton of goods, and were drawn by as many as fourteen paired oxen, with the strongest at the rear of the team. The drivers, known as ‘transport riders’, controlled the beasts with a whip rather than reins and were landless Boers and Africans who ‘blazed their own trails’, driving their wagons across the open veldt. Even here, however, the wagon was eventually superseded by railways, which set out to destroy their cheaper competitor by placing pressure on governments to introduce restrictive laws, and, in eastern South Africa where they owned the ports, applying surcharges on traffic arriving at or leaving harbours by road. The result was that large numbers of drivers became destitute and moved to the towns, contributing to the urban poverty that blighted the country after the turn of the century, though some continued to eke out a living serving communities located some distance from the railheads.

Railways

Railways were constructed and operated both by colonial administrations and private companies.
1. Construction and Finance of Government Lines

Colonial government lines were built by consulting engineers, in what was known as the department system, by contractors and by local Public Works departments and financed by the British government, loans, short-term advances and private capital.

**Department Construction**

*Nature and adoption.* The department system was adopted in the Crown colonies from the mid-1890s to the early 1900s. Theoretically, infrastructure was built by colonial Public Works departments. In reality, local engineers had little involvement in construction, which was organized by the Crown Agents, a quasi government organization that acted as the Crown colonies’ development agency and by consulting engineers, in the case of Africa by William Shelford and his son Frederic, who became his father’s partner in 1899, and, in 1906, on William’s death, took over the family firm. After the Colonial Office had decided that there was a need for a railway, the consulting engineers completed a reconnaissance survey to determine possible routes. Using the information collected, they then determined the mode of construction and estimated the likely costs and the economic viability of each route. Their report was sent to the Crown Agents, who added their own comments, and then passed to the Colonial Office, which decided whether the scheme would go ahead. If approval was given, from approximately 1905 the consulting engineers undertook a location survey that determined the exact direction of the chosen route and then sent a team led by a senior engineer, known as a resident engineer, to the colony, which set about building the line.

Department construction was adopted in the West African colonies of Southern Nigeria, the Gold Coast and Sierra Leone. In Southern Nigeria, the first line to be built was the Iddo to Ibadan railway, begun in 1895 and completed in March 1901. To connect Iddo with the port of Lagos, a two mile 2’ 6” gauge tramway was then constructed from the Iddo railhead, along the waterfront, to Government House and the European residential area (1902). After which, the main line was extended to Oshogbo (1907), Ilorin (1908), Jebba (1910) and Minna (1912), where it joined up with the Public Works Department-built Northern Nigerian Baro–Kano railroad. In the Gold Coast, a line was laid from the south-west coastal port of Sekondi inland to Tarkwa (1901), from where two extensions were constructed: one travelling to Broomassie (1910) and the other to the mining centre of Obuasi (1902) and then onto the Asante capital, Kumasi (1903). Proposals for a Sierra Leone railway were first made in 1872 and eventually came to fruition in 1896 when tracks were laid from the capital Freetown to Wellington (1897), Waterloo (1898) and Sogotown (1899). This line was then extended to Rotifunk (1900), Bo (1903) and
Baiima (1905), and, in 1903, Freetown was connected to the European residential area of Hill station by 5.5 miles of track, known as the mountain railway.\textsuperscript{19}

The adoption of the department system was promoted by both the Crown Agents and the Colonial Office. As discussed below, the Crown Agents disparaged both construction by contractor and local Public Works Department, though their enthusiasm for the use of consulting engineers was probably at least partly driven by self-interest. The system ensured that all the materials required for construction would be purchased by themselves and that they would thus earn large revenues from the commissions earned; gave them greater control of the building process, reducing the likelihood of poor quality lines and colonial criticism; and permitted the operation of nepotism. Frederick Shelford was the son-in-law of the senior Crown Agent, Sir Montague Ommanney, and Frederic’s uncle, Thomas Shelford, was one of the ‘greatest friends’ of Sir Maurice Cameron, the Agent in charge of engineering. For the Colonial Office, the system avoided the delays in the commencement of works that occurred when contractors were used and which led to complaints from outside interest groups; ensured the purchase of British construction materials; reduced the likelihood of clashes between constructors and local populations; and avoided the legal proceedings that usually followed a contractor’s demands for additional payments and drew attention to over-expenditure and again led to criticism.\textsuperscript{20}

\textit{High costs.} The system was the subject of much colonial, parliamentary and press complaint. Construction costs were relatively high as compared to the consulting engineers’ survey estimates and similar railways (see \textit{Tables 1} to \textit{3}), the lines were poorly built, and, once completed, were often uneconomic, revenues failing to match the engineers’ pre-construction projections. Building costs were high relative to estimates because of the harsh African environment, discussed in the Construction thematic introduction, and because both the Crown Agents and the consulting engineers encouraged Colonial Office authorization of lines by underestimating costs.\textsuperscript{21} The potential difficulties of construction were minimized and estimates often contained inadequate margins for contingencies; used approximated quantities, particularly for bridges and rolling stock; omitted expenses, such as the cost of unloading railway materials at harbour-side; underestimated land prices; and took no account of the rise in labour expenditure that would result from a project’s own demand for workers.\textsuperscript{22}
### Table 1: Departmental Railways.

<table>
<thead>
<tr>
<th>Railway</th>
<th>Length (miles)</th>
<th>Gauge</th>
<th>Gradient/curves/rail weight</th>
<th>Cost per mile (£)</th>
<th>Miles constructed per month</th>
<th>Under/overestimate (%)</th>
<th>Method of construction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Southern Nigeria</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lagos–Ibadan</td>
<td>125</td>
<td>3' 6&quot;</td>
<td>1 in 50; 10 chains; 55 lb per yard</td>
<td>9,967</td>
<td>2.049</td>
<td>+78</td>
<td>Dept.</td>
</tr>
<tr>
<td>Ibadan–Oshogbo</td>
<td>62</td>
<td>3' 6&quot;</td>
<td>1 in 60 and 1 in 80 out</td>
<td>6,905</td>
<td>2.3</td>
<td>+9</td>
<td>Dept.</td>
</tr>
<tr>
<td>Oshogbo–Illorin</td>
<td>61</td>
<td>3' 6&quot;</td>
<td>1 in 80; 15 chains</td>
<td>7,883</td>
<td>3.05</td>
<td>+36</td>
<td>Dept.</td>
</tr>
<tr>
<td>Illorin–Jebba</td>
<td>60</td>
<td>3' 6&quot;</td>
<td>Not known</td>
<td>8,587</td>
<td>3</td>
<td></td>
<td>Dept.</td>
</tr>
<tr>
<td>Jebba–Minna</td>
<td>160</td>
<td>3' 6&quot;</td>
<td>1 in 80 and 1 in 100 out</td>
<td>8,693</td>
<td>6.7</td>
<td>+65</td>
<td>Dept.</td>
</tr>
<tr>
<td><strong>Average cost per mile £8,407</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Sierra Leone</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freetown–Songotown</td>
<td>32</td>
<td>2' 6&quot;</td>
<td>1 in 60; 5 chains; 30 lb per yard</td>
<td>6,061</td>
<td>0.97</td>
<td>+45</td>
<td>Dept.</td>
</tr>
<tr>
<td>Songotown–Rotifunk</td>
<td>23</td>
<td>2' 6&quot;</td>
<td>1 in 50; 30 lb per yard</td>
<td>4,224</td>
<td>2.55</td>
<td>−17</td>
<td>Dept.</td>
</tr>
<tr>
<td>Rotifunk–Bo</td>
<td>80</td>
<td>2' 6&quot;</td>
<td>1 in 50; 30 lb per yard</td>
<td>3,988</td>
<td>3.5</td>
<td>+23</td>
<td>Dept.</td>
</tr>
<tr>
<td>Bo–Baiima</td>
<td>87</td>
<td>2' 6&quot;</td>
<td>1 in 50</td>
<td>3,604</td>
<td>Not known</td>
<td>+0.4</td>
<td>Dept.</td>
</tr>
<tr>
<td>Mountain railway</td>
<td>5.75</td>
<td>2' 6&quot;</td>
<td>1 in 22</td>
<td>5,604</td>
<td>0.38</td>
<td>+4</td>
<td>Dept.</td>
</tr>
<tr>
<td><strong>Average cost per mile £4,696</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gold Coast</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sekondi–Tarkwa</td>
<td>40</td>
<td>3' 6&quot;</td>
<td>1 in 40; 5 chains; 50 lb per yard</td>
<td>9,162</td>
<td>1.2</td>
<td>+53</td>
<td>Dept.</td>
</tr>
<tr>
<td>Tarkwa–Kumasi</td>
<td>130</td>
<td>3' 6&quot;</td>
<td>As above</td>
<td>10,669</td>
<td>4.8</td>
<td>+89</td>
<td>Dept.</td>
</tr>
<tr>
<td>Tarkwa–Broomassie</td>
<td>26.5</td>
<td>3' 6&quot;</td>
<td>Not known</td>
<td>6,101</td>
<td>1.104</td>
<td>+20</td>
<td>Dept.</td>
</tr>
<tr>
<td>Accra–Akwapim</td>
<td>36</td>
<td>3' 6&quot;</td>
<td>1 in 80; 45 lb per yard</td>
<td>9,856</td>
<td>1.08</td>
<td>+47</td>
<td>Contractor</td>
</tr>
<tr>
<td><strong>Average cost per mile £8,947</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Northern Nigeria</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bar–Kano</td>
<td>355</td>
<td>3' 6&quot;</td>
<td>1 in 60</td>
<td>3,915</td>
<td>8.07</td>
<td>+8</td>
<td>PWD</td>
</tr>
<tr>
<td>Bauchi line</td>
<td>90</td>
<td>3' 6&quot;</td>
<td>Not known</td>
<td>2,000</td>
<td>6.43</td>
<td>0</td>
<td>PWD</td>
</tr>
<tr>
<td><strong>Average cost per line £2,957</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nyasaland</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chiromo–Blantyre</td>
<td>–</td>
<td>3' 6&quot;</td>
<td>1 in 44; 5.5 chains; 41 lb per yard</td>
<td>5,854</td>
<td>Not known</td>
<td>Not known</td>
<td>Private</td>
</tr>
</tbody>
</table>
Table 2: Cost of other British-Built Colonial Lines.  

<table>
<thead>
<tr>
<th>Colony</th>
<th>Mileage</th>
<th>Cost per mile (£)</th>
<th>Gauge</th>
<th>Method of construction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Crown colony lines</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyprus</td>
<td>61</td>
<td>2,023</td>
<td>2' 6&quot;</td>
<td>Department</td>
</tr>
<tr>
<td>British Honduras</td>
<td>25</td>
<td>5,291</td>
<td>n/k</td>
<td>Department</td>
</tr>
<tr>
<td>Barbados</td>
<td>28</td>
<td>6,968</td>
<td>2' 6&quot;</td>
<td>Private</td>
</tr>
<tr>
<td>British Guiana</td>
<td>98</td>
<td>7,023</td>
<td>2' 6&quot;</td>
<td>Private</td>
</tr>
<tr>
<td>Natal</td>
<td>399</td>
<td>8,916</td>
<td>3' 6&quot;</td>
<td>Contractor</td>
</tr>
<tr>
<td>Ceylon</td>
<td>577.75</td>
<td>11,038</td>
<td>83% 5' 6&quot;</td>
<td>33% Contractor</td>
</tr>
<tr>
<td>Straits/Federated Malay States</td>
<td>359</td>
<td>11,325</td>
<td>17% 2' 6&quot;</td>
<td>66% Department</td>
</tr>
<tr>
<td>Trinidad</td>
<td>81.5</td>
<td>11,456</td>
<td>4' 8.5&quot;</td>
<td>56% Contractor</td>
</tr>
<tr>
<td>Jamaica</td>
<td>184</td>
<td>13,804</td>
<td>4' 8.5&quot;</td>
<td>44% Department</td>
</tr>
<tr>
<td>Mauritius</td>
<td>120</td>
<td>15,650</td>
<td>4' 8.5&quot;</td>
<td>79% Private</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>21.5</td>
<td>25,581</td>
<td>4' 8.5&quot;</td>
<td>21% Contractor</td>
</tr>
<tr>
<td>(includes tunnelling costs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Non-Crown colony lines</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victoria – 18 lines</td>
<td>610</td>
<td>1,290–2,400</td>
<td>2' 6&quot;, 5' 3&quot;</td>
<td>n/k</td>
</tr>
<tr>
<td>Queensland – 5 lines</td>
<td>227</td>
<td>1,327–2,495</td>
<td>3' 6&quot;</td>
<td>n/k</td>
</tr>
<tr>
<td>South Australia – 7 lines</td>
<td>238</td>
<td>1,544–2,590</td>
<td>3' 6&quot;, 5' 6&quot;</td>
<td>n/k</td>
</tr>
<tr>
<td>Egyptian Delta line</td>
<td>303</td>
<td>1,708</td>
<td>2' 6&quot;</td>
<td>n/k</td>
</tr>
<tr>
<td>Rhodesia</td>
<td>1,937</td>
<td>5,008</td>
<td>3' 6&quot;</td>
<td>Private</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>51% 5' 6&quot;</td>
<td>n/k</td>
</tr>
<tr>
<td>India</td>
<td>34,656</td>
<td>9,524</td>
<td>42% 1 metre</td>
<td>7% 2'/2' 6&quot;</td>
</tr>
</tbody>
</table>

*Note: Including full costs, n/k = not known.*
Table 3: Cost of French and German Lines.25

<table>
<thead>
<tr>
<th>Railway</th>
<th>Mileage (miles)</th>
<th>Gauge</th>
<th>Cost per mile (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>French West Africa</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivory Coast</td>
<td>281</td>
<td>1 metre</td>
<td>6,417</td>
</tr>
<tr>
<td>Lome–Palime</td>
<td>63</td>
<td>1 metre</td>
<td>6,190</td>
</tr>
<tr>
<td>Cotonou–Save</td>
<td>162</td>
<td>1 metre</td>
<td>5,185</td>
</tr>
<tr>
<td>Konakry–Niger</td>
<td>93</td>
<td>1 metre</td>
<td>5,120–5,696</td>
</tr>
<tr>
<td>St Louis–Dakar</td>
<td>164</td>
<td>1 metre</td>
<td>5,120</td>
</tr>
<tr>
<td>Thies–Kayes</td>
<td>423</td>
<td>1 metre</td>
<td>4,624</td>
</tr>
<tr>
<td>Kayes–Niger</td>
<td>350</td>
<td>1 metre</td>
<td>4,224–4,800</td>
</tr>
<tr>
<td>Central Dahomey</td>
<td>204</td>
<td>1 metre</td>
<td>4,117</td>
</tr>
<tr>
<td>Lome–Atakpame</td>
<td>104</td>
<td>1 metre</td>
<td>3,456–5,309</td>
</tr>
<tr>
<td>PortoNovo–Pobe</td>
<td>47</td>
<td>1 metre</td>
<td>3,357</td>
</tr>
<tr>
<td>Lome–Anecho</td>
<td>27</td>
<td>0.75 metre</td>
<td>2,015</td>
</tr>
<tr>
<td><strong>Average cost per mile £4,529–4,803</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>German West Africa</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swakopmund–Windhoek</td>
<td>n/k</td>
<td>1’10.5”</td>
<td>3,114</td>
</tr>
<tr>
<td>Otavi RR</td>
<td>n/k</td>
<td>1’10.5”</td>
<td>2,010</td>
</tr>
<tr>
<td><strong>Average cost per mile £2,562</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The actual cost of lines was raised by the piecemeal nature of construction and the nature of the department system. Owing to a lack of funds and a wish to minimize losses if lines failed to pay, the Colonial Office only permitted short lengths of track to be built at any one time, which reduced potential economies of scale, and, as ultimate destinations were unknown, made it difficult to plan cost-effective alignments. Expenditure was further raised by the departmental system itself. By allowing location surveys to be carried out during construction rather than before building commenced, as occurred when contractors were used, the system led to hurried surveys, particularly if construction was ‘treading on ... (the surveyor’s) ... heels’, and poor and costly alignments and gradients. The voluminous correspondence between Shelford and his resident engineers resulted in high administration expenses and delays, and, as discussed in the Operations thematic introduction, the construction materials purchased by the Crown Agents were overly expensive.26

More importantly, the system led to the building of expensive high standard lines and relatively slow construction, which again raised costs. Unlike railways built under other systems (see Construction thematic introduction), departmental railways were generally constructed to a high standard. Wide gauges were adopted, which increased material and land expenses and required more cuttings and embankments; stone rather than wooden or steel bridges were erected; and most lines had a large number of well-equipped stations. The Agents’ and Shelford’s justification for such quality was that the capital savings of low standard lines were relatively small; as discussed in the Operation of Lines thematic
introduction, any capital savings would be offset by high operating costs. Poor quality lines also had small carrying capacities and would eventually have to be upgraded causing relatively expensive disruption of traffic. The true reason was that they both benefited from high standard works. The lines required large amounts of building materials, which increased the revenue they received from its purchase (see Operations thematic introduction), were unlikely to generate reputation damaging colonial criticism as regards poor line performance, and took longer to build and thus increased Shelford’s remuneration.  

Until 1905, Shelford was paid a salary. This was higher than the remuneration consulting engineers obtained from private clients and that other consulting engineers employed by the Agency received, plus the payment of a salary encouraged Shelford to deliberately slow progress in order to maximize his income (see Table 4). The Crown Agents and Colonial Office were bombarded by minor queries and construction methods were adopted that prevented rapid progress. Little plant was used, as machinery was supposedly expensive compared to the cost of labour and its use impeded by the thickness of the forest and the perceived intellectual deficiencies of African labourers. There were no temporary diversions around heavy earthworks and viaducts to prevent their construction slowing track-laying, and, rather than using the spoil removed from cuttings to build embankments, Shelford simply dumped the material and obtained fresh embankment earth from specially dug ‘borrow’ pits. Under pressure from colonial administrations and the Colonial Office, the Agents gradually reduced Shelford’s salary and, in 1905, this was replaced by a fee and a percentage payment scale based on the estimated cost of works, which eliminated the benefits of slow construction and discouraged underestimation of costs.  

Table 4: Construction Fees Paid to Crown Agent and Foreign Office Railway Consulting Engineers, 1897–1906.  

<table>
<thead>
<tr>
<th>Consulting engineer</th>
<th>Cost of works supervised (£ million)</th>
<th>% of salary to cost</th>
<th>% of expenses to cost</th>
<th>% of total remuneration to cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shelford &amp; Son (CAs, West Africa)</td>
<td>4</td>
<td>0.6</td>
<td>0.9</td>
<td>1.54</td>
</tr>
<tr>
<td>Messrs Gregory Eyles &amp; Waring (CAs, Far Eastern colonies)</td>
<td>5.8</td>
<td>0.2</td>
<td>0.28</td>
<td>0.49</td>
</tr>
<tr>
<td>Messrs Rendal &amp; Robertson (Foreign Office, Uganda railway)</td>
<td>4.9</td>
<td>0.074</td>
<td>0.075</td>
<td>0.149</td>
</tr>
</tbody>
</table>

Shelford, in turn, paid his resident engineers relatively high salaries and generous ‘extras’, and the payment of a salary and the fact that the engineers were employed only for the duration of the construction project, again, led to idling
and the erection of unnecessary works. On the Lagos railway, for example, one bridge that was not required was built and another constructed that was too large. The resident engineers and their teams also had little knowledge of local conditions or labour rates, were more prone to illness than local engineers, and were distrusted by Public Works Department staff, who often withheld help and information – all of which raised costs.\textsuperscript{30}

**Poor construction.** Although the Crown Agents and Shelford aimed to build quality lines, many were shoddily constructed. For example, when handed over to the colony, the Lagos–Ibadan railway was only half ballasted and had an incomplete drainage and telegraph network; while the Sekondi–Tarkwa line had an uneven track. These inadequacies were largely due to Frederic Shelford’s meagre engineering skills and the poor monitoring of the construction process. Owing to William Shelford’s poor health, much of the work before his death was undertaken by Frederic, who was just twenty-eight when he was made a partner and had been an associate member of the Institution of Civil Engineers for only two years. Shelford’s abilities were widely criticized, and, in 1910, at the age of thirty-nine he abandoned the engineering profession to become successively an East African cocoa farmer, barrister and a Nyasaland tea planter. His lack of skills was often matched by those of his resident engineers. The worldwide boom in railway construction had resulted in a shortage of engineers, few of whom wished to endanger their health by working in Africa. Shelford thus had to recruit relatively inexperienced men, many of whom on arrival in Africa were immediately poached by local mining companies.\textsuperscript{31}

Ideally, the work undertaken should have been closely monitored. Theoretically, the Colonial Office and the Crown Agents perused quarterly reports on the progress of works prepared by Shelford, and, in the case of the Agents, the resident engineers’ monthly progress summaries and their correspondence with their employer. Copies of these documents were additionally passed to the governor of the constructing colony, who also saw the works’ accounts and could inspect the construction sites. Shelford, in turn, followed progress via his resident engineers’ reports/correspondence and made site visits, and the resident engineers directly monitored their own construction staff. Finally, before a completed line was handed over to the local colonial administration, it was inspected by an engineer or the manager of the colony’s railway department.\textsuperscript{32}

In reality, these strategies proved ineffective. The Colonial Office and the Crown Agents lacked the technical expertise and time to judge the accuracy of the information provided by Shelford, which was presented in a highly technical and lengthy form; perhaps to deflect criticism.\textsuperscript{33} To minimize costs, Shelford made relatively few trips to Africa and was thus unable to determine the accuracy of the information provided by his engineering teams, and, in any case, was
unlikely to draw attention to any construction staff errors or irregularities that came to light. In the colonies, long leave periods and high turnover and invalidity/mortality levels led to constant changes of resident engineers and made the supervision of construction staff difficult. Governors, who again generally lacked engineering expertise, were at first discouraged by the Crown Agents from intervening in the construction process in order to avoid delays and to ensure that the consulting engineer could be held directly responsible for work. Later, under pressure from the Colonial Office, resident engineers were placed under an obligation to furnish governors with any information required and to follow their wishes in all matters affecting the use of the works when finished provided that they were consistent with sound engineering principles. As for the inspection of completed lines, this was again unlikely to be overly critical. Inspection engineers were recruited by the consulting engineer, and, in the case of the Ibadan–Oshogbo line, Frederic Shelford himself took on the role. Railway department managers, meanwhile, were unlikely to criticize the consulting engineer who had recruited them (see Operation of Lines thematic introduction), advised the colony on their salaries, and on whom they would depend for selection if they wished to move to another colony.34

Unprofitability. In addition to being expensively and poorly built departmental lines were uneconomic, revenues failing to match the consulting engineers’ pre-construction projections (Table 5). Inevitably, the railways were subject to the problems discussed in the Operation of Lines thematic introduction, but a further reason for their unprofitability was that the Crown Agents and Shelford overestimated their returns in order to encourage Colonial Office authorization of construction and to strengthen their case for high standard works. The majority of consulting engineers’ reports predicted that proposed lines would immediately cover both working and debt charges. Where this was not the case, it was usually stated that any loss would be temporary and that the shortfall would be offset by increased customs revenues on the trade fostered by the line. Occasionally, when it appeared that a railway they had disparaged would actually be built, they improved their forecasts of profitability, and, when a completed line failed to pay, they continued to insist that their predictions would be fulfilled or used the failure to encourage further construction, warning that the project would only become remunerative if an extension was built. The Crown Agents, not surprisingly, generally welcomed these optimistic conclusions, raising doubts only when they believed them to be overly pessimistic. The Colonial Office, lacking the expertise to judge the veracity of the economic analysis and believing that all railways promoted growth, generally accepted the advice without comment.35
Table 5: Profit and Loss of West African and other Crown Colony Railways (£).\textsuperscript{36}

<table>
<thead>
<tr>
<th>Colony</th>
<th>Net profit/loss</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1901</td>
</tr>
<tr>
<td><strong>West African Lines</strong></td>
<td></td>
</tr>
<tr>
<td>Gold Coast</td>
<td>−16,179</td>
</tr>
<tr>
<td>Lagos</td>
<td>130,131</td>
</tr>
<tr>
<td>Northern Nigeria</td>
<td>not known</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>−11,753</td>
</tr>
<tr>
<td><strong>Other Crown colony lines</strong></td>
<td></td>
</tr>
<tr>
<td>Ceylon</td>
<td>177,629</td>
</tr>
<tr>
<td>Cyprus</td>
<td>not known</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>not known</td>
</tr>
<tr>
<td>Jamaica</td>
<td>−77,307</td>
</tr>
<tr>
<td>Mauritius</td>
<td>25,688</td>
</tr>
<tr>
<td>Straits</td>
<td>15,503</td>
</tr>
<tr>
<td>Trinidad</td>
<td>4,360</td>
</tr>
</tbody>
</table>

To arrive at their findings, the consulting engineers used construction costs to determine loan interest/sinking fund charges and based expected working expenses on those of similar lines. Revenue calculations took account of import, export, passenger, government and future receipts. Although the methods adopted varied, export estimates were generally calculated according to the export figures of the nearest port, surveyors’ road traffic counts, information gleaned from local chiefs and merchants, or the result of the multiplication of the average per square mile yield of the main crops grown by the number of square miles to be served by the railway from which home consumption (the average population per square mile multiplied by the assumed annual per capita consumption) was subtracted. Total exports were then multiplied by the freight rate that the engineers believed the exports could bear, which was generally below that charged by competing forms of transport. Import estimates were based on import figures or the import traffic of similar railways, which was again multiplied by a given freight rate. Passenger revenues were determined using population figures, road traffic counts and the passenger rates of similar lines. While future receipts were arrived at by multiplying the expected per acre crop of the product that was expected to be grown by the expected acreage and freight rate and adding an estimate of the natural increase in traffic, usually the growth rate of a similar line.\textsuperscript{37}

The eventual forecasts, however, tended to be wide-of-the-mark. Projected debt charges were based on underestimated construction costs and working expense predictions on figures from dissimilar lines, and, in the case of extensions, it was assumed that the new railway in the first instance would be worked at a reduced cost by existing operating staff. All revenue calculations were based on a single assumed freight rate, which took no account of the different goods to
be carried. Traffic counts were limited, taking place over a week at most, took no account of seasonal variations in movement and assumed that all freight would be transferred to the railway and that head load carriers would maintain their existing rates. The information obtained from chiefs and merchants, who also wished construction to go ahead, was often exaggerated and future projections were based on slight evidence and took no account of the possible unwillingness of African farmers to grow the projected crops, the lack of feeder roads, or problems of perishability.38

Contractor Construction

By the early 1900s the Colonial Office, fearing the prospect of unbalanced budgets and perturbed by parliamentary criticism began to seek a replacement for the department system, proposing that lines should be built by contractors or local Public Works departments or that colonial administrations should abandon their transportation role to the private sector. Contractors had been used to build several government railways, including Natal’s main and Northern Coast lines. The Agents, however, strongly opposed this form of construction. Contractors were often permitted to purchase building materials, thus depriving the Agency of purchasing revenue, and it was argued that they bought poor quality materials to reduce costs and built substandard lines. To avoid criticism, the Agents had to choose the lowest and therefore usually the poorest quality tender, and, once a contract had been signed, they could not alter the route or the design for fear of subsequent heavy claims for additional payments, even if new information became available that improved alignment. There was also a danger in the case of lump sum contracts, under which contractors performed the work for one fixed fee, that companies would reduce quality to increase profits, or, if conditions proved worse than expected, minimize losses.39

The poor quality of contractor railways was supposedly matched by their high cost. Tender bids were high as the harsh local environment, the small size of projects and the informal division of regions between companies minimized competition and the bids contained large contingency margins to ensure that a profit would still be made even if conditions were more difficult than expected. Colonies had to pay preliminary expenses, for example for the drawing up of contracts, the tender process and so on, and lost the income earned from opening completed sections of unfinished lines to traffic and the contractor’s profit margin, which could be large if construction was easier than expected and the contingency margin not drawn upon. They also had to employ a consulting engineer and a resident engineer to monitor construction, could face claims by the contractor for additional payments that often had to be settled through time-consuming and costly arbitration, and, if the contractor went bankrupt, would have to complete the line themselves.40
In reality, many of the Agents’ claims were spurious. Contractors’ costs were relatively low and the quality of construction relatively high. Contractors employed highly experienced and efficient engineers, whose performance required little or no monitoring; used specialized plant, which they moved from project-to-project; and purchased construction materials at a lower price than the Agency. Demands for compensation and extras were rare and the problem of high contingency margins could be overcome through the use of schedule contracts, under which the rates for the various classes of work to be completed were set and contractors paid sums calculated at the agreed rates for the work actually performed.  

Despite the Agents’ scare tactics, the Colonial Office was keen to experiment with contractors. A proposal to use them to build the extension of the Lagos line beyond Ibadan was successfully opposed by the Agency. However, in 1906 under pressure from the colonial administration, Colonial Office officials insisted that construction of the Gold Coast Accra–Akwapim railway be undertaken by contract. The Agents’ response was to sabotage the experiment by choosing as contractor a firm operated by a Mr Murphy, who had no experience of overseas construction and whose tender was 19 per cent below Shelford’s cost estimate. Not surprisingly, the line was completed late and poorly built, lacking sufficient bridges, ballast and earthworks, and Murphy requested additional payments and was accused of opening sections of the unfinished line to traffic and ‘pocketing’ the receipts. The experiment was regarded by the Colonial Office as a failure and not repeated.

Public Works Department Construction

The majority of African government lines were built by local Public Works departments, which possessed valuable local knowledge, and, identifying with the colony and likely to maintain the completed works, had greater commitment to low cost and quality construction than consulting engineers and contractors. In the Crown colonies of West Africa, Public Works departments were only used to build lines after the failure of the department system. Needless to say, the Crown Agents strongly opposed local construction, arguing that the completed works would be both expensive and substandard, as government engineers lacked the necessary surveying and building expertise/experience and eminent consulting engineers would be reluctant to provide advice and designs, as they would be unwilling to work with colleagues professionally and socially inferior to themselves. Moreover, it would be difficult to attribute responsibility for unsatisfactory work, particularly given the high turnover of personnel; construction would divert staff from their normal duties; and there was a danger that government engineers would place greater weight on the wrongheaded
views of colonial governments on whom their future livelihoods depended than on those of the Colonial Office and Crown Agents.\textsuperscript{43}

The first locally constructed line was the 1901 Northern Nigerian 22-mile Zungeru railway required to link the new administrative headquarters of the colony to the Kaduna River. The governor, Sir Frederick Lugard, a long-time foe of the Agents, demanded that his own engineers be allowed to construct the line, and, given the urgency of the project, the Colonial Office agreed. The works were completed in six months and cost a mere £1,389 per mile.\textsuperscript{44} Encouraged by this success, Lugard then proposed a further locally built line from Baro on the north bank of the Niger to Kano, an important trading centre. Lack of funds forced the project to be abandoned until 1906 when Winston Churchill, another opponent of the Agents, became colonial parliamentary under secretary of state and green-lighted the scheme, declaring that it should be used to test the viability of local construction. In the event, the line, laid down by the Public Works Department assisted by the Royal Engineers and South African engineers, cost just £3,915 per mile, 40 per cent below Shelford’s estimate, and was completed in a relatively short time and to a high standard. Such was its success that the Colonial Office required all future Crown colony railways to be built locally.\textsuperscript{45}

Subsequent works built by the Nigerian Public Works Department included the Bauchi line (1912); the Zaria–Jos–Bukuru railway (1912–14), extended in 1929 from Zaria to the cotton producing areas of Kaura Namoda; and the line from Port Harcourt to the coalfields of Enugu, which was connected to the western line in 1926.\textsuperscript{46} Elsewhere in West Africa, local construction was used for the Sierra Leone Bauya Junction to Makeni branch line (1914), later extended to Kambai; the Gold Coast Accra–Kumasi line, started in 1914, but only completed in 1923 due to the outbreak of the First World War and a smallpox epidemic; and the Gold Coast Central Province Huni Valley to Kade railway (1923–7), built to open up cocoa and mahogany growing regions and to provide a link to the new harbour at Takoradi.\textsuperscript{47}

In South Africa, Public Works Department construction, occasionally with the help of contractors, began far earlier. The discovery of diamonds in the early 1870s prompted the construction of railways towards Kimberly from the ports of Cape Town, Port Elizabeth and East London.\textsuperscript{48} The extension of these lines into Transvaal and the Orange Free State was opposed by the local governments and a breakthrough only occurred in 1888 when the Cape proposed to extend the Port Elizabeth–Colesberg line into Orange Free State and threatened an extension of the Cape Town–Fourteen Streams railway into the Transvaal or though Bechuanaland if the government refused to grant permission. The rouse was successful and the line reached Bloemfontein, the Orange Free State capital, in 1890 and was then extended into the Transvaal, reaching Johannesberg in 1892, thus opening the three Cape ports to the Rand goldfields.\textsuperscript{49} Subsequent Cape lines included branches to Maclear/Butterworth (1906) and Umtata
(1916) and the Touws River–Ladismith railway (1923). In Natal, the hub of the railway system was Durban. From 1878 to 1880, a railroad was built from the port to Camperdown via Pinetown and Bothas Hill. A line to Elandslaagte was then opened in 1888, connecting Howick, Estcourt and Ladismith, followed by a line to Johannesburg in 1895. Other works included the 1889–91 Wesselsneck–Charlestown railway, which travelled through Biggarsberg (now Glencoe) and Newcastle and branches to Richmond (1897), Greytown (1900), Donnybrook (1906), Riverside (1909), Matatiele (1924) and Kokstad (1924).

Railways in East Africa were dominated by the Uganda line. Construction by British military engineers from India began in 1896 at the port of Mombasa and eventually reached Kisumu on the eastern shore of Lake Victoria in 1901, an extension to Kampala appearing in 1931. Other major lines in Kenya were the Nairobi–Thika tramway and the Kisumu–Mumias, Eldoret and Voi–Taveta railways. The tramway was proposed by the governors Sir F. Tryer and Sir Percy Girouard in 1906 and 1907, respectively. Both proposals were turned down by the Colonial Office, which finally permitted construction in 1911. The tramway was later extended to Muranga, Nyeri and Nanyuki, and additional branches built to Solari (1926), Nyahururu (1929) and Butere (1931). The line to Eldoret was laid in 1924 and later extended to Kitale (1926) and the Voi–Taveta railway was built from 1914–15 for strategic reasons and to provide access to the Taita–Taveta sisal growing region. By the early 1930s, apart from Sotik–Kericho, all European communities were within 40 km of a railhead.

Tanganyika was less well supplied with lines. On taking over the country, the British built extensions to the existing German railways. A branch of the Dar es Salem to Kigoma Central route (1904–14) was constructed from Tabora to Mwanza on the southern shore of Lake Victoria (1928) and the Tanga–Mombo–Moshi line (1899–1911) was connected to the Uganda railway at Voi (1924) and then extended to Arusha (1929). In 1934, a branch line was also laid from Manyoni to Kinyangiri, but this was abandoned in 1947.

Finance of Government Construction

Public sector construction was financed by the British government and by the Crown Agents. Imperial government finance was minor and took the form of a number of one-off loans and two development schemes. The largest ad-hoc loan was the £5.5m provided by the Foreign Office to finance the Uganda railway, which was eventually written off. Other significant contributions included the £60,000 provided for the 1907 Nairobi–Thika tramway, the £3.5m for extensions to the Uganda railway (1924) and the £10m for the development of transport in East Africa and Palestine (1926). The two development schemes were largely ineffective. In the late 1890s, the Treasury agreed to finance Chamberlain's railway construction programme.
through advances from a colonial development fund, which contained excessive Post Office saving account funds that could not be profitably invested in the UK. Unfortunately, the passage of the empowering legislation through Parliament was delayed and the Treasury then began to have doubts about the scheme, fearing that the funded lines would fail to generate sufficient revenue for repayment. The bill was consequently abandoned and replaced by the Colonial Loans Act, which provided advances only for a limited number of projects. Moreover, the Crown Agents were reluctant to employ the legislation. The loans carried a relatively high interest rate, were insufficient for the designated works and included a first charge on the revenues and assets of the borrowing colony i.e. if the local administration defaulted on its debts, any revenue/assets available would be used to pay these loans before any other obligations. The charge, along with the implication that the Treasury had little confidence in colonies’ abilities to repay their debts, would thus reduce private investors’ willingness to buy the securities of administrations that accepted the advances. Not surprisingly, therefore, the Agents made little use of the loans. £0.792m was obtained in 1900 for the Lagos railway and small amounts drawn upon to pay off a number of current and bank advances made in 1898/9 and to finance small projects in regions that were unlikely to require further funds.

The second development scheme appeared in 1929. A further Colonial Development Fund was established to promote the advance of agriculture and industry in the colonies and thereby foster industrial expansion in the UK through the provision of grants, loans or the payment of interest on loans raised elsewhere. For a variety of reasons, described in the General Introduction to the first collection of the Britain and Africa series, Economic Development of Africa, 1880–1939, by 1940 only £8m had been distributed, £4.307m to Africa, and only a small proportion of this amount was used to fund transport developments.

The majority of the funds used to finance construction came via the Crown Agents, which issued loans, provided short-term advances and arranged the provision of private capital. The loans were either publicly issued or sold to private institutions on the London money market (see Table 6). From 1880 to 1939, £128.3m of African government colonial stock was issued or sold on the London market, of which £83.425m was used to finance public works, railways or harbours. Each loan had a lifespan of five to sixty years, after which it had to be repaid, a price per stock, an annual interest charge of between 2.5 and 6 per cent of its value, and, after issue, was quoted on the stock market. Occasionally, if a colony failed to spend all the money raised on the project listed in the loan prospectus, the Agents allowed the unspent balance to be used for other purposes. In the case of the 1929 Nigeria issue, for example, £0.550m obtained to finance the construction of the Lagos sewerage scheme was used to build a railway and a college.
Table 6: African Loans Publicly Issued in London to Primarily/Part Finance Public Works Construction.⁵⁹

<table>
<thead>
<tr>
<th>Year</th>
<th>Colony</th>
<th>Amount (£m)</th>
<th>Interest rate (per cent)</th>
<th>Price (£)</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860</td>
<td>Cape</td>
<td>0.3</td>
<td>6</td>
<td>–</td>
<td>n/k</td>
</tr>
<tr>
<td>1860</td>
<td>Cape</td>
<td>0.2</td>
<td>6</td>
<td>–</td>
<td>H</td>
</tr>
<tr>
<td>1860</td>
<td>Natal</td>
<td>0.05</td>
<td>6</td>
<td>103.45</td>
<td>H</td>
</tr>
<tr>
<td>1861</td>
<td>Cape</td>
<td>0.15</td>
<td>6</td>
<td>105.95</td>
<td>P</td>
</tr>
<tr>
<td>1862</td>
<td>Cape</td>
<td>0.0295</td>
<td>6</td>
<td>–</td>
<td>H</td>
</tr>
<tr>
<td>1862</td>
<td>Natal</td>
<td>0.05</td>
<td>6</td>
<td>105.61</td>
<td>H</td>
</tr>
<tr>
<td>1863</td>
<td>Cape</td>
<td>0.15</td>
<td>6</td>
<td>108.13</td>
<td>P</td>
</tr>
<tr>
<td>1863</td>
<td>Cape</td>
<td>0.024</td>
<td>5.5</td>
<td>108</td>
<td>H</td>
</tr>
<tr>
<td>1864</td>
<td>Cape</td>
<td>0.02</td>
<td>6</td>
<td>100.17</td>
<td>H</td>
</tr>
<tr>
<td>1865</td>
<td>Cape</td>
<td>0.029</td>
<td>6</td>
<td>101.05</td>
<td>H</td>
</tr>
<tr>
<td>1865</td>
<td>Cape</td>
<td>0.01</td>
<td>6</td>
<td>–</td>
<td>H</td>
</tr>
<tr>
<td>1866</td>
<td>Cape</td>
<td>0.02</td>
<td>6</td>
<td>–</td>
<td>H</td>
</tr>
<tr>
<td>1867</td>
<td>Cape</td>
<td>0.2</td>
<td>6</td>
<td>104.64</td>
<td>P, F</td>
</tr>
<tr>
<td>1867</td>
<td>Natal</td>
<td>0.0655</td>
<td>6</td>
<td>103.86</td>
<td>H</td>
</tr>
<tr>
<td>1867</td>
<td>Natal</td>
<td>0.05</td>
<td>6</td>
<td>100.66</td>
<td>I</td>
</tr>
<tr>
<td>1871</td>
<td>Sierra Leone</td>
<td>0.025</td>
<td>6</td>
<td>100</td>
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<td>Colony</td>
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<td>Price (£)</td>
<td>Purpose</td>
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Notes: P = Public works; R = Railways; H = Harbour; I = Immigration; M = Military operations; F = Internal/External Finance; R/C = Redemption/conversion.

Initial purchasers of the loans were stockbrokers, who in the fullness of time sold their allocations to the general public at a profit; financial institutions, which retained their purchases as reserves; and ‘stags’, private investors who bought securities in the hope that the price would rise soon after issue when they would be immediately resold. Generally, stockbrokers had little difficulty offloading the stock purchased. Investors were confident that dividends and capital would be repaid; the imperial government would never allow colonial administrations to default, as non-payment would destroy the Agents’ ability to raise further funds and damage the legitimacy of the empire. They were equally assured that the market price of their securities would be free from fluctuations or shocks. Colonies were secure from internal and external aggression, largely due to the might of the British army and navy, and the high ethical standards of colonial administration made it unlikely that loan proceeds would be subject to fraud. Moreover, most investors were convinced that transport projects would generate large revenues relatively quickly and that their investment would benefit British industry. The completed infrastructure ultimately increased British exports to Africa and reduced the cost of primary imports, and, as described in the Operations thematic introduction, all the construction materials and locomotives etc. were sourced from UK firms.  

The short-term advances used to finance the early stages of a project were obtained from colonial current account surpluses, the Bank of England, the
London and Westminster Bank and the inter-colonial loan scheme, all of which are described in the General Introduction to the first collection of this series.\(^{61}\) The advances ensured that by the time a loan was floated the construction of the works was well underway and an accurate estimate of their final cost could be made. As a result, there was less likelihood that a colony would run out of money and have to return to the market and damage its financial credibility, and the fact that a project was already being built increased public demand for the loan. Also, if an issue was made before work commenced, a large proportion of the proceeds would remain idle, earning interest at a lower rate than that payable, and the colony would have to begin making Sinking Fund contributions at an earlier date.\(^{62}\)

The Agents’ attempts to arrange private finance had mixed results. In the Gold Coast in 1900, the Ashanti Goldfields Corporation agreed to cover half the interest and Sinking Fund charges on loans raised for the Tarkwa–Kumassi line, and, for twenty years, to make up the net earnings of the railway to £30,000 per annum if they fell below this figure. In return, it received an efficient means of transport to/from its mines, a guaranteed freight rate of 1\(\text{s}\) 6\(\text{d}\) per ton for imports and 1\(\text{s}\) per ton for exports, and a fifth of all profits if earnings exceeded 4.5 per cent of capital expenditure. Similar attempts to finance the Tarkwa–Prestea and Princisu lines proved more problematical. In 1903, a number of mining companies agreed to advance £0.15m at 5 per cent for the construction of the Tarkwa–Prestea railway and another mining firm, backed by the Bank of British West Africa, offered to provide £0.07m at 3 per cent interest for a branch to Princisu. Unfortunately, support for both deals collapsed. The organizer of the Tarkwa–Prestea syndicate died and the Bank of British West Africa, on discovering that the Princisu loan would be repaid in Gold Coast stock, pulled out of the project. In the case of the Tarkwa–Prestea railway, however, in 1906 Fanti Consolidated Mines Ltd, supported by the Union of London and Smiths Bank, agreed to provide up to £0.122m at 3 per cent to be repaid in cash or stock towards the construction of the line, and to make good annual receipts if they fell below 3.5 per cent of capital expenditure. On completion of the works, the company further agreed to finance the extension to Broomassie on similar terms.\(^{63}\)

2. Private Construction

Construction by private enterprise was relatively rare.\(^{64}\) Although colonial governments encouraged private sector participation through the provision of capital/interest guarantees, land/mineral concessions and operational subsidies, few companies were willing to commence construction.\(^{65}\) The high cost of the works necessitated the raising of vast amounts of capital and the likely future returns were often low and uncertain. Those entrepreneurs who did want to become involved frequently put forward proposals that were impracticable or served their own interests rather than those of the colony and were
often company promoters, who lost interest in the project after they had raised and sometimes siphoned off into their own coffers the necessary capital. Others lacked construction experience and built poor quality works, and, unable to borrow money as cheaply as colonial governments, even with guarantees, tended to set high traffic rates. There were also strong objections in official circles to the provision of incentives. These could increase the cost of lines and discourage economy in their operation, as had disastrously occurred in India, the concessions offered could prove more lucrative than expected, and land grants could lead to politically embarrassing and expensive African unrest.66

Private sector construction largely occurred in South and East Africa in the early years of colonial rule. In Rhodesia, apart from the 1928 Zambesi Saw Mills logging line, the railways were built by the British South Africa Company.67 The Fontesvilla to Umtali line began in 1892 and was completed in February 1898 and provided the colony with a lifeline to the sea.68 It was followed in 1893 by a railroad from Vryburg in the Cape to Bulawayo, finished in 1898, which was then extended to Salisbury in 1902, construction having been brought to a halt by the Boar War.69 The discovery of coal, chrome and zinc/lead then led to extensions to Wankie (1902), Umvukwes (1928) and Broken Hill, respectively, the latter line on the discovery of copper at Katanga being continued to the Congo border and onto Elizabethville and the mines in 1909.70

The railways were built and operated by a number of companies including the Bechuanaland Railway Co. (1899), renamed Rhodesia Railways Co. in 1899, the Mashonaland Railway Co. (1897), the Rhodesia–Katanga Junction Railway Co. (1908), the Shabani Railway Co. and the Beira Railway Co. (1892), which in 1895 became the Beira Junction Railway Co.71 All obtained the necessary finance for construction through the issue of debenture stock on the London Stock Exchange, and, although theoretically free-standing entities, were closely linked to the British South Africa Co., which owned significant portions of their share capital and sometimes guaranteed the payment of the interest of their debenture loans.72 Amalgamation leading to State ownership began to occur from the turn of the century. In 1900 the Mashonaland Railway took over the Beira Junction company to become the Beira & Mashonaland Railway Co. Ltd, which, in 1903, merged with the Rhodesia Railway Co. and became the Beira & Mashonaland and Rhodesia Railways Co. Ltd. Renamed Rhodesia Railways Co. Ltd in 1927, this firm then acquired the Rhodesia–Katanga Junction Railway Co., and, in 1947 was finally bought by the Rhodesian government for £30m and renamed Rhodesia Railways.73

South African private construction occurred far earlier. In the early 1860s, lines were built from Durban harbour to the centre of the City by the Natal Railway Co. and from Cape Town to Wellington to serve the grape growing districts of the Western Cape by the Cape Town Railway and Dock Co. Cape Town was
then connected to Wynberg in 1864 by the Wynberg Railway Co. Thereafter, little private construction took place in the Cape until 1907 when the South Western Railway Co. laid a 2’ gauge line to transport timber from Deepwells to Knysna for milling into sleepers. In the Transvaal, anti-railway sentiment delayed all construction until the 1890s. The first project green lighted in 1890 was a line between Johannesberg and the Boksburg coal mines, financed by George Pigot Moodie and later extended to Krugersdorp (20 miles) and Springs. A far longer railway from Delagoa Bay to Pretoria was delayed owing to lack of funds. The concession to build the line had been given to the German Nederlandsche Zuid-Afrikaansche Spoorweg Maatschappij (NZASM) in 1887. Unfortunately, by mid-1891, the firm was on the brink of bankruptcy and found it was unable to issue European debentures. Construction was therefore only completed in 1894 after the Cape prime minister Cecil Rhodes agreed to loan the Transvaal administration the necessary finance.74

Gradually, all these lines were taken over by local administrations. In 1874, the Cape government purchased the Town Railway & Dock Co. and the Wynberg Railway Co. and established Cape Government Railways (CGR). A similar organization, Natal Government Railways (NGR) was formed by the Natal administration in 1877, and, in 1900, after victory in the second Anglo-Boer War, the railroads of Orange River Colony and the Transvaal were taken over by the British government and operated as Imperial Military Railways, later renamed Central South African Railways (CSAR). On the creation of the Union of South Africa in 1910, the CGR, NGR and CSAR were incorporated into South African Railways, in 1916 renamed South African Railways and Harbours (SARH), which, in addition to operating the country’s rail infrastructure, undertook a comprehensive programme of port expansion, grain silo and cold storage construction, and acquired a merchant fleet.75

In the Crown colonies and protectorates, private sector involvement was strongly opposed by the Crown Agents, partly because private constructors bought their own railway materials and thus deprived the Agency of purchasing income.76 In 1896, however, the Foreign Office insisted that a railway from Chiromo to Port Herald in Nyasaland be built privately. The Agents, again, attempted to halt the initiative. The Foreign Office was urged to allow the protectorate to build the line itself and the decision to grant the Shire Highlands Co., the firm permitted to construct the works, 3,200 acres of land was strongly opposed. Failing to convince the Foreign Office to abandon the project, the Agents turned their attention to the company itself. Contract negotiations were delayed and the Agents insisted that construction be supervised by consulting engineers and a resident engineer, whose salaries were to be paid by the company, and that an unnecessary high technical standard be adopted. After building had commenced, they and their consulting engineers then sent the Colonial Office
a barrage of complaints that enumerated the firm’s failure to meet the standard laid down, its supposedly poor finances, its operation of the uncompleted line and its alleged dishonesty. When the company made an application to build an extension to Blantyre, the Agents redoubled their efforts to sabotage the project, raising a myriad of objections, the most important of which related to the height of the track. All were rejected and the Agents were sharply criticized by the Colonial Office for their disreputable conduct. When the company made an application to build an extension to Blantyre, the Agents redoubled their efforts to sabotage the project, raising a myriad of objections, the most important of which related to the height of the track. All were rejected and the Agents were sharply criticized by the Colonial Office for their disreputable conduct.77 Bruised, they raised few objections to the 1915 extension from Port Herald to the Zambezi at Chindo nor to the Kenyan Konza–Magadi railway. The latter line was built by the Magadi Soda Co. established in 1911 by private British capital to exploit the soda ash deposits of Lake Magadi. The company agreed to wholly finance the railroad, and, in return, was given the exclusive right to exploit the deposits, land at Kilindini harbour to build a pier, more land at Ngong for the construction of its headquarters and preferential freight rates from the Uganda railway.78

3. Consulting Engineers and Contractors

All African railways, whether publicly or privately built, employed the services of a consulting engineer, who provided valuable engineering advice, helped in the choice and procurement of rolling stock, and, in the case of the department system, constructed the lines. The sector was dominated by a handful of engineers. As discussed, in West Africa William Shelford (1834–1905) was the dominant player. Shelford was briefly in partnership with T. F. Turner, later professor of engineering at Kings College, and later with his son Frederic (1871–1943), who largely ran the business. On William’s death, Frederic entered into a ‘partnership’ with the engineer Sir Benjamin Baker (1840–1907), and, on Baker’s death, Robert Elliott Cooper (1845–1942). These, however, appear to have been marriages of convenience, entered into merely to satisfy the Colonial Office, with neither ‘partner’ having much involvement in construction. Baker was a world expert on bridge design and acted as the Cape’s consulting engineer. Cooper later became chairman of the War Office Committee of Hutted Camps and served on the British Standards Committee.79

In Egypt, the dominant force was John Fowler (1817–98), and, in South Africa and Rhodesia, Douglas Fox & Partners. Founded by Charles Fox (1810–74), the latter firm was inherited by his sons Charles Douglas Fox (1840–1921) and Francis Fox (1844–1927) and was consulting engineer to the Shire Highlands Railway Co., the Rhodesia, Mashonaland and Beira Railway Co., the Benguela Railway Co., and the Trans-Zambesia Railway Co. Its progress was greatly helped by its close relationship with Cecil Rhodes and the British South Africa Co., which largely controlled the various Rhodesian railway operations. The partner Charles Metcalfe (1853–1928) had attended Oxford University with Rhodes and played a part in negotiating the lucrative amalgamation
between the British South Africa Co. and the Exploring Co., which had been
given mineral concessions in Bechuanaland in exchange for the construction of
a line through the protectorate. The firm was later consulting engineer to the
central Argentine, south Indian, southern Sao Paulo and Dorada railways, and,
in 1938 when Sir Ralph Freedom became senior partner, was renamed Freedom
Fox & Partners.

All these engineers shared a number of characteristics. They were at the top
of their professions, had been involved in works of similar size elsewhere in
Africa and the world and were influential figures in the Institution of Civil Engi-
neers. William Shelford and Charles Metcalfe were Council members and John
Fowler, Benjamin Baker, Charles Douglas Fox and Robert Elliot Cooper were
presidents. They thus had the experience and expertise that ensured the con-
struction of quality lines and the poor performance of their duties or financial
malpractice would damage their commercially valuable professional status. It
can be argued, however, that such men were often over-qualified for the projects
for which they were retained, and, as a result, that they sometimes expended
little effort on the work. Most were simultaneously involved in dozens of works
around the globe and could only devote a small amount of their time to each of
them, leaving the bulk of the work to assistants.

Other shared characteristics were the possession of offices in Great George
Street, Westminster, and links of patronage and kin. The Westminster location,
one of the most expensive in real estate terms in London, flagged to potential
suitors the success of their operations, gave them easy access to Parliament,
government departments and the Crown Agents, whose headquarters were in
the vicinity, and reaped agglomeration economies. Closeness to each other and
to networking arenas such as the professional institutions and places of social
gathering facilitated the exchange of formal information about professional and
technical developments, potential markets for their skills, pricing strategies and
so on, and the spread of informal gossip regarding the honesty and abilities of
potential employers, employees and fellow members of the profession.

The engineers had also usually learnt their trade in Africa and were closely
interconnected by patronage and kinship. The empire was regarded as a train-
ing ground for young engineers, where they could build their characters, acquire
leadership abilities, and learn from their mistakes before moving on to more
lucrative work elsewhere. During their early years, Charles Beresford Fox (1875–
1912) worked in Rhodesia, Henry Wedgwood Rendel in Uganda and Frederic
Shelford in the Gold Coast. Patronage and kin connections, meanwhile, gener-
ated trust and ensured that the profession presented a united front to employers
both as regards fees and performance. An apprenticeship with a prominent engi-
neer was a passport to success. Places were difficult to obtain and were costly;
in the 1870s candidates were required to pay a premium of £500 and had to
absorb expenses of another £500 for the duration of their training. It is therefore perhaps not surprising that many of the railway and other engineers started their careers together. Benjamin Baker and William Shelford, for example, were trainees at the office of John Fowler and Charles Metcalfe was an assistant to Douglas Fox. The engineers also had kin links; sons following fathers into the profession, allowing them to free ride on the reputations of their paterfamilias. As already discussed, Frederic Shelford followed his father into the sector, as did the two sons of Douglas Fox and the son of Alexander Rendel.85

The contracting sector was even narrower than that of consulting engineering, largely comprising just one firm, Pauling & Co. founded in 1877 by George Craig Sanders Pauling. After constructing the 65-mile Port Alfred railway, the firm went on to build, among others, the Sterksroom–Aliwal North, Orange River–Kimberley, Springs–Krugersdorp and Johannesburg–Pretoria lines, and, the first stage of the route between Beira to Umtali.86 In all, from 1877 to 1939, it built 5,922 miles of African lines and was helped in its endeavours by its close relationship with the merchant bankers the House of d’Erlanger and the British South Africa Co. D’Erlanger was the most important investor in the British South Africa Co.’s various railroad schemes and was part-owner of Pauling & Co. In order to maximise its returns, it thus put pressure on the British South Africa Co. to use its governmental powers to give Paulings a virtual monopoly of construction.87

4. Purchase of Railway Materials

Purchase Procedure

Materials, including rolling stock, for Crown colony and protectorate railways were purchased by the Crown Agents, and, for lines in self-governing territories, by the local operating departments in conjunction with their consulting engineers. Private railway companies bought their own materials, again with help from their consulting engineers. The Crown colonies had no choice but to purchase all goods not manufactured in their own territories, and, from 1904, in adjacent regions, through the Crown Agents. The colonies produced few materials themselves and it was believed that local purchasing officers would be tempted to accept bribes from suppliers in return for orders, could turn to foreign manufacturers, and would buy expensive and poor quality goods, owing to their lack of procurement expertise and experience. Meanwhile, the main alternate source of supply, colonial merchants, charged high prices for their merchandise, being unable to buy in bulk and having high profit margins, and, again, could not be relied upon to supply good quality British-made produce.88

In reality, not all territories used the Agency (see Table 7). Colonial administrations bought materials secretly or placed orders with local ‘manufacturers’,...
which then subcontracted the work to British companies, and, in the West and South African colonies/protectorates, some local purchase was permitted. As discussed in the Shipping thematic introduction, to avoid the high rates charged by the cartel that controlled the transport of goods from the UK to West Africa, local governments were permitted to buy locally produced coal, cement, and, in the case of Southern Nigeria and Sierra Leone, Kerosene oil. In the Transvaal and Orange River colony, the purchase of public goods by the Agents on the conclusion of the Boer war led to such strong protests from the Johannesburg Chamber of Commerce and the legislative councils that the Colonial Office, fearing ‘serious political consequences’, agreed that tenders could be issued simultaneously within the colonies and in Britain, and that orders would be allocated to the company that a local tender board decided offered the best terms. During the inter-war period, as the colonial manufacturing base expanded and criticism of the Agents increased, a similar compromise was adopted elsewhere in Africa, with the result that by 1936 a good proportion of goods were sourced locally.  

Table 7: African Contraventions of Crown Agent Purchase.  

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<tr>
<td>Central African Railway</td>
<td>In the half year July to December 1903, only 70% of stores were bought through the Agents.</td>
</tr>
<tr>
<td>Gold Coast</td>
<td>In 1900, an Accra clerk was discovered to have ordered large amounts of goods privately.</td>
</tr>
<tr>
<td>Natal</td>
<td>In 1881 the Harbour Board appointed its own purchasing agent.</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>In 1908 admitted that it was ‘a long established practice’ for goods such as timber, cement, bricks, galvanized iron etc. to be purchased from local merchants.</td>
</tr>
<tr>
<td>Southern Nigeria</td>
<td>By 1907 the colony purchased only small quantities and low value goods from the CAs, obtaining ‘the greater part of its supplies from India and Zanzibar’.</td>
</tr>
</tbody>
</table>

Crown Agent purchase was the subject of numerous criticisms – the most significant of which were that goods were delivered late and were overly expensive. Delays in the delivery of orders were a common gripe throughout the period. Explanations include the early decision to send requisitions by mail rather than telegraph to reduce costs; the referral of indents back to colonies because they were incorrectly prepared, requested unavailable or inappropriate articles and so on; the inspection of goods (described below); the sourcing of supplies from manufacturers rather than wholesalers; the poor monitoring of the progress of orders; and the failure of British companies to meet delivery times. The latter could have been rectified had the Agents sanctioned late deliverers, but this failed to occur. There were fears that the enforcement of contract late delivery clauses would lead to lengthy and expensive legal action and damage the Agency’s relations with their suppliers, who would refuse to supply goods or charge a premium.
Prices were excessive largely because of the Agents’ purchasing procedures. Theoretically, stores with a value over £100, and, from 1929, £150, had to be bought through open competition, and, before buying lower value goods, the Agents had to obtain tenders from three or more tradesmen. In reality, few articles under £100/150 were subject to tender, supposedly because large wholesalers were reluctant to bid for small orders. Whilst goods over that value were not tendered if the goods were required urgently; the price had recently been determined by competition; a consulting engineer had advised against the use of tenders; the Agents had a standing order for an article from a particular firm, which in return charged a discounted price; and, in the inter-war period, if the colony named a manufacturer or proprietary brand in its indent. Where tenders were requested, open competition only occurred in the case of materials for the Uganda railway, which the Foreign Office insisted should be obtained through public advertisement. In all other cases, tenders were requested only from companies on the Agents’ supplier lists, which contained relatively few firms. The existence of the lists was not advertised and companies that wished to have their names added had to furnish numerous references, and, from 1911, undergo a works inspection by the Agents’ inspectors.92

Inclusion on a list, however, did not guarantee an order. Only a small number of list companies were asked to bid for contracts, generally those that had been recommended by the consulting engineer that had drawn up the tender specification. Of these, many rarely received an order. The Agents and their consulting engineers only chose the most competitive bid if the tender was judged to fulfil all the colonies’ requirements and the tenderer was believed to possess sufficient experience and to produce high quality goods. Orders, consequently, tended to be awarded to a small coterie of suppliers. These were usually well-established British manufacturers that had long trading relationships with the Agency, often extending over decades. They were also often located in the south of England and occasionally had personal connections with Crown Agents and employed the Agency’s consulting engineers as directors.93

There is evidence that these suppliers set unacceptably high prices. Many manufacturers failed to provide the Agents with full trade and cash discounts and export allowances, and, in the inter-war period, demanded and activated contract price variation clauses, which allowed the final price to be increased if costs were higher than expected. Others belonged to cartels that agreed amongst themselves the prices they would bid. The Steel Sleeper Association and the Switches and Crossings (Export) Association, for example, in the inter-war period used the Agency as a ‘milch cow’, charging them far higher prices than any other customer and using the resultant profits to cross-subsidize more competitive foreign work.94 The Agents fought such cartels, favouring firms that operated outside rings or putting pressure on weak cartel members to break ring
agreements by threatening them with removal from their lists. But, although successful in some sectors, such tactics largely failed to break cartel influence.\textsuperscript{95}

It also seems likely that prices would have been lower had the Agents made greater use of overseas firms or purchased goods in bulk or in advance. Foreign purchase was discouraged by the higher cost of sourcing supplies from abroad and Colonial Office support of British preference, motivated by a fear of the loss of colonial markets. Foreign firms were thus only invited to tender for supplies where the Agents wished to force British firms or cartels to reduce prices, there was a clear price or delivery advantage to overseas purchase or the goods were not manufactured in the UK.\textsuperscript{96} Bulk orders, for which the Agents would have received price discounts, were not possible owing to the tendency of colonial governments to purchase only small amounts of materials at any one time and to demand non-standardized articles, though this changed over time. Advance orders were precluded by colonies’ penchant for requesting goods only when needed and the Agents’ reluctance to buy in advance, which tied up capital for no return, involved high storage and deterioration costs, and, if prices subsequently fell, could lead to criticism.\textsuperscript{97}

The cost of supplies was further raised by the inclusion in the final price of a myriad of additional fees. The Agents themselves charged a purchasing commission of 1 per cent and later 1.33 per cent of the value of all the goods bought. Although far lower than that demanded by colonial merchants, the commission was higher than the fees of private railway companies. The Office’s buying procedures were highly bureaucratic and inefficient and they used part of the commission to subsidise the cost of other services they provided to colonial governments for which they received no remuneration.\textsuperscript{98}

In addition to the Agents’ commission, there were also inspection, shipping, insurance and legal fees. A large majority of goods were inspected during production and prior to despatch to the colonies by freelance inspectors and the Agency’s consulting engineers, and, from 1904, by a salaried full-time inspectorate. The Agents argued that inspection was essential. The goods supplied were used in areas with few tools for repairs and a considerable distance from the nearest repair depot, and, if an article could not be mended, an order for a substitute would have to be made. The replacement of faulty articles therefore could involve the loss of the use of equipment for a considerable period of time. Others claimed such inspection was excessive. The use of leading firms, which possessed their own inspection departments and whose reputation and business would be damaged by the supply of poor quality goods, made the practice unnecessary. Moreover, the fees charged were relatively high and some of the examination ineffective, failing to prevent the supply of defective goods. Over time, therefore more and more governments rejected inspection of their supplies and the Agents themselves decided that the examination of particular goods should cease.\textsuperscript{99}
Shipping charges were raised by the use of a shipping agent and a refusal to charter vessels. The shipping agent, Messrs J. & R. B. Freeland received a commission double that charged by the India Office’s agent and private Indian and Egyptian railway companies. According to the Freeland, this was because Crown colony freights involved a great deal more work than those of the India Office and private firms. The Crown Agents shipped from more ports and to a larger number of destinations and the delicate nature and odd dimensions of the goods transported necessitated lengthy negotiation of rates and the employment of storage inspectors to ensure they were correctly stowed. A more likely reason was that the company was operated by the sons of the Crown Agents Sir William Sargeaunt and Sir Ernest Blake, who had little experience of shipping work, and it was these connections, along with the firm’s inefficiency, that prompted the 1908 parliamentary enquiry into the Agency to demand that the firm’s duties be taken over by the Agency, which occurred in 1911.  

Similar self-interest probably explains the high insurance and legal fees charged. Freights were insured by London Assurance, whose charges were double those paid by colonial merchants and two of whose directors were the Crown Agents Sir Ernest Blake and Sir Montague Ommanney. The drawing up of purchasing contracts, meanwhile, was undertaken by Messrs Sutton, Ommanney & Rendel, who charged high fees, performed their work poorly and were owned by Ommanney’s uncle and brother, and later son and nephew. As with the shipping agency, both relationships came to an end after the enquiry into the Agency, which required the Office to establish its own insurance scheme and employ other solicitors.  

The Freeland and the Agents were additionally strangely reluctant to charter ships through open competition, preferring to use shipping cartels (known as conferences), the activities of which are described in the Shipping thematic introduction. It was argued that the conference lines provided a superior service to tramp steamers – more favourable rates and rebates, and, more importantly, regular sailings. Independently owned ships often failed to sail during periods of poor trade or particular seasons when no return cargo was available, and it was claimed that the tendering process and the need for cargoes to accumulate until the chartering of a steamer became cost-effective would lead to delays in shipment. The company’s and the Agents’ preference for the conferences, however, may also have been related to the fact that the chartering/tendering process would have raised their workload and costs and thus reduced the profits that they made from the organisation of shipments.
Identity of Suppliers

Most African rolling stock was sourced from just six firms. The most important was perhaps the North British Locomotive Co. established in 1903 by the merger of three Glasgow rolling stock firms: Sharp Stewart & Co. (Atlas works), Neilson Reid & Co. (Hyde Park works) and Dubs & Co. (Queens Park works). On formation, this was the largest locomotive building company in Europe and sold locos to South Africa and Sierra Leone.¹⁰³ Both countries also sourced locomotives from Hawthorn Leslie & Co. and Beyer Peacock & Co. Hawthorn, was founded on Tyneside in 1886 and continued to trade in the sector until 1937 when it sold its railway arm to Robert Stephenson & Co. Beyer Peacock, established in 1854 by the German engineer Charles Frederick Beyer (1813–76) and Richard Peacock (1820–89), produced the groundbreaking Garratt articulated locomotive, which also proved popular in Rhodesia.¹⁰⁴ Other companies of note were Nasmyth, Wilson & Co. (1836), a Salford based firm that additionally produced machine tools, and two Leeds firms – the Hunslet Engine Company (1864), suppliers to Nigeria and Sierra Leone, and Kitson & Co., founded in 1835 and disappearing in 1938.¹⁰⁵

Harbour Construction

One of the main purposes of railways, and, to a lesser extent, roads, was to transport raw materials to the ocean for shipment to Europe and to move imports into the interior. Such trade was dependent on the availability of harbours able to handle the vast amounts of merchandise involved and the development of ships and a shipping sector to carry the goods to and from more developed nations. The rise of the two companies that dominated African shipping – Elder Dempster in West Africa and Union-Castle in East and South Africa – and the impact their monopolistic position had on the development of the continent is discussed in the Shipping thematic introduction.

African harbour development can be divided into five stages. At the start of the colonial era, there was a scattering of small ports strung along the coast (Phase 1). These were mostly unconnected, contained a European trading post or fort and were populated by Africans, who traded with Westerners or acted as middlemen for trade with the interior. The ports had relatively small hinterlands and were often at river mouths, facilitating movement inland. The number of coastal centres then began to decline. The expansion of trade led to the construction of railways, which allowed those harbours at termini to expand (Phase 2) and the completion of branch lines and roads to the trunk lines enlarged the hinterlands of some ports at the expense of others (Phase 3). Finally, the surviving ports were linked by rail and road (Phase 4) and the main inland centres were also interconnected (Phase 5).¹⁰⁶
As trade expanded, within ports, docks and deep water harbours were constructed. The number of natural harbours in Africa was limited and many were too small to cope with the increase in the volume of business and contained various natural hazards. Unlike the railroads, the docks/harbours were largely built by local colonial administrations with the help of British consulting engineers, who completed the necessary design work. Harbours were smaller projects than railways and required less labour, construction materials and engineering expertise/experience. Occasionally, however, colonies would employ contractors, and, in the Crown colonies and protectorates until approximately 1906, the department system of construction was adopted. Consulting engineers employed by the Crown Agents designed and then built the works, though in the case of the 1907 Lagos harbour scheme, the consulting engineer subcontracted the more mundane dock design, inspection and construction work to another far less prestigious firm. The result was that many projects were poorly built and costs often exceeded estimates. The final cost of the Old Calabar quay wall (1904) and Accra harbour (1907–9), for example, exceeded the estimates by 19 per cent and 22 per cent, respectively. From 1906, therefore harbours were increasingly constructed by local Public Works departments, with consulting engineers merely designing schemes and providing advice on construction.\(^{107}\)

The consulting engineering firm most commonly appointed both in the Crown colonies and elsewhere, was John Coode & Son, which possessed all the characteristics of the typical consulting engineer described above. The founder of the company, Sir John Coode (1816–92), had served an apprenticeship with a prestigious practitioner (James M. Rendel, the uncle of the harbour engineer J. M. Dobson); established offices in Westminster; became a president of the Institution of Civil Engineers (1889–91); and passed the business onto his son, who, in turn, gave way to his son, Arthur Trevenen Coode. The firm acted as consultants in the Cape, Natal, Sierra Leone, Nigeria, and the Gold Coast as well as in Australia, New Zealand, Ceylon and India.\(^ {108}\)

In the Gold Coast, the dominant harbour was Sekondi–Tarkwa. The construction of the railway from Kumasi to the port led to its rapid expansion and the decline of adjacent centres such as Axim, Dixcove, Adjua, Shama, Komena and Elmina. The completion of the line from Kumasi to Accra then promoted further growth, again at the expense of other coastal towns.\(^ {109}\) The main drawback of the port was that it was not a deep water harbour and cargo had to be trans-shipped to ocean going vessels in surf boats and lighters, increasing costs and resulting in salt water damage.\(^ {110}\) Two great breakwaters were thus built from 1921 to 1928 and later extended at a cost of £3.23m. The completed works covered an area of 220 acres and contained wharves, storage and loading space, but operated at a loss until after the Second World War owing to high debt charges and docking fees.\(^ {111}\)
Like the Gold Coast, Nigeria possessed two main ports. The first to develop was Lagos, which served the Yoruba–Aja hinterland slave trade, and, after the suppression of slavery, became the main outlet of palm oil and timber. Like Sekondi–Tarkwa, the harbour possessed physical drawbacks and the cost of improvements reduced the port's competitiveness. To solve the problem of littoral drift and shifting channels that made entrance to the lagoon difficult, in 1906 the bar began to be dredged and an East Mole was constructed that pushed the harbour entrance seawards. Four further deep water berths of 548.64 metres at Apapa were then built. Unfortunately, the cost of these works forced the harbour authorities to charge high fees and these and the multiplicity of agencies and interdepartmental disputes caused the port to lose out to Port Harcourt. The latter was founded in 1913 to export the coal recently discovered at Enugu. By 1920, it was the second largest seaport in the country, having been used in the First World War as the centre of military operations against German Kamerun, and, in 1927, was further extended with the construction of four 1,920' berths.

In East Africa, the main port was Mombasa, where a deep water harbour at Kilindini was constructed in 1926, and, in South Africa, harbour facilities developed at Port Natal, Cape Town, Port Elizabeth and East London. Although Port Natal (Durban) possessed a lagoon, like Lagos the entrance contained a sand bank that permitted only smaller vessels to enter and exit and forced the trans-shipment of cargo to and from ocean going ships anchored in the outer bay, where they were exposed to strong winds. Numerous consulting engineers were employed to solve this problem. After the failure of a 1840s scheme designed by J. C. Caro, the authorities in the early 1850s employed the renowned engineer John Milne, who proposed the construction of two piers to narrow the harbour entrance and thus quicken and increase the scouring power of the currents. Faced with a shortage of funds, equipment and stone, he constructed only 137 metres of a North pier, which unsurprisingly failed to relieve the situation. The mantle was then taken up by Captain James Vetch, who proposed the enclosure of the outer harbour via two further piers. Regrettably, Vetch refused to visit the site and the information he received regarding the direction of the prevailing wind direction proved inaccurate. The works constructed were thus destroyed by storms, and, when the contractor went bankrupt and the £160,000 loan issued to finance the scheme ran out, the project was abandoned. Vetch was succeeded by Sir John Coode, who proposed a resurrection of the Milne plan, and by Edward Innes, who simply suggested that silt at the entrance be removed. Dredging commenced, and, by 1904, ocean going ships were able to enter the harbour.

Port Natal’s main competitors were Port Elizabeth, East London and Cape Town. Cape Town was slow to develop. Cut off from its immediate hinterland by the Cape flats and Holland mountains, it lacked a major export commodity. It was only with the discovery of gold and diamonds that the port began
to expand, with further growth being generated by the Boar and First World Wars. Port Elizabeth, with its large wool exports, developed far earlier. Its major drawback was the lack of an enclosed harbour and Algoa Bay’s notorious breakers, which were only overcome in 1922. The final port, East London, located around a lagoon at the mouth of the Buffalo river, was founded thirty years after Port Elizabeth and possessed geographic and climatic advantages. Political circumstances, however, slowed its growth until the 1870s, as did the shallow depth of the river Buffalo. Attempts to improve depths by Woodford Pilkington were abandoned because of the high cost, and it was only in the early 1870s when the discovery of diamonds in Griqualand made a further project feasible that Sir John Coode was appointed to design and construct training walls that would guide the river current into deepening the channel. The walls and the commencement of dredging in 1886 enabled ocean going ships to use the harbour, but, by this time, the port had lost momentum to its competitors.

Roads

Until the 1920s, colonial governments gave road construction a low priority. Road transportation was relatively expensive and regarded as unwanted competition to railways, which would damage receipts and make it even more difficult to ensure that these gigantic enterprises broke even. Many administrations also lacked the funds necessary to fund road construction, particularly during the First World War; acquiesced to lobbying from river carriers; and were fearful of the possible social and political consequences of an extended road system. It was a common belief that motor transport by increasing mobility would disrupt fragile social structures and lead to the spread of crime and dissent. Colonial governments thus built few roads and those that were constructed rarely ran parallel to the local railway. The commercial viability of existing thoroughfares, meanwhile, was minimized by taxing and forbidding motor transport on routes already served by rail and by cutting freight rates where road competition emerged.

Two other problems were the poor quality of existing routes and a lack of motor vehicles. African roads possessed sharp contours, were often impassable in the rainy season or blocked by fallen trees and traversed rivers via pole bridges, prone to collapse, and pontoons, unable to bear any great weight. Constructed of earth and sand, cars and lorries had to travel in third gear, causing boilers to boil over, and their weight cut deep ruts into surfaces leading to the formation of ‘razor backs’, mounds of earth that destroyed sumps and had to be constantly lowered. Motor vehicles were conspicuous by their absence. In Rhodesia, the first car only appeared in 1902, and, by 1916, the country possessed just six vehicles. The situation was hardly much better in the Gold Coast and Kenya, which contained twenty-one (1912) and 1,000 (1919) motor vehicles, respectively.
Explanations, apart from the poor roads, include shortages of petrol, spare parts, mechanics and garages; the high price and cost of importing vehicles; and, in Rhodesia, the difficulty of following routes that often became overgrown with weeds and Tambookie grass.\textsuperscript{128} The nature of the early vehicles also contributed. Their poor quality engines were noisy and prone to overheating, often necessitating journeys to take place at night, their non-removable wooden-spoked wheels made long trips uncomfortable, and the rubber covers that surrounded these wheels often perished in the hot sun or were punctured by stones.\textsuperscript{129}

Road transportation only grew in importance during the inter-war period. The war itself played a part in this renaissance. The need to transport large amounts of goods, men and equipment to areas not served by railways led to greater use of road transport, and, in the aftermath, administrations faced a shortage of head carriers, large numbers of whom had died serving the allied cause, and lacked the materials, funds and labour necessary for railway construction.\textsuperscript{130} Other factors were a growing awareness by commercial communities and administrations of the benefits of motor transportation and a rise in vehicle ownership. Over time, both expatriate firms and administrations gradually became aware of the economic advantages of road transportation. British companies experienced the benefits of road construction in other parts of the empire, and, facing greater economic turbulence, wished to avoid the high freight rates charged by monopolistic railway companies. They thus placed increasing pressure on legislative councils to increase spending on roads.\textsuperscript{131} Colonial administrations and governors were similarly more attune to the economic and revenue possibilities of motor transport and its advantages over rail. Roads were cheaper to build than railroads, could easily be abandoned if they failed to prove their commercial worth, removed the need for costly trans-shipment of goods, and, with improvements in construction, were less subject to closure due to natural disasters.\textsuperscript{132}

Roads also possessed other benefits for colonial governors and administrations. For governors, they were easily acquired physical evidence of achievement that could boost their social status and self-confidence and help to advance their careers.\textsuperscript{133} For administrations, in towns they minimized the risk of fire, and, in the countryside, facilitated settlement, the spread of ‘civilizing’ education, and the control and administration of local Africans.\textsuperscript{134} Roads and vehicles were visible symbols of the might of colonial rule and European technological mastery and superiority, and permitted the rapid transportation of troops to quell disturbances. Colonial officers could also more easily tour their districts and thus display their physical presence, an important component of control, and collect official and unofficial information that could be used to avoid or crush dissent. Gifts of cars to chiefs, meanwhile, helped to incorporate them into the colonial project.\textsuperscript{135}

Just as important as these factors was the rapid increase in the ownership of cars, lorries and bicycles, which were cheap and easy to repair and store.\textsuperscript{136}
Kenya in 1923 possessed 2,608 motor vehicles, Rhodesia, in 1928, 10,800 cars, and Uganda, in 1930, 1,500 lorries. The expansion in car/lorry numbers was related to the appearance of American vehicles, such as Fords, Dodges and REOs. These were cheaper than European models and possessed technical advantages. Not only were they more durable, but spare parts were widely available, reducing repair and maintenance costs. More importantly, they had a high road clearance, reducing damage caused by razor backs, were equipped with Firestone pneumatic tyres that ensured a smoother ride, and were lighter and could thus more easily travel on and did not destroy unsurfaced roads, reducing road maintenance costs. The vehicles were popular throughout the continent, but particularly in the Gold Coast, where in 1927 they accounted for 78 per cent of the cars imported.

Roads were mainly constructed by colonial governments, but also by Africans and occasionally by the European private sector. Government roads were built using a variety of labour sources. In East Africa, much road construction and maintenance was undertaken by African convicts and conscripted labourers, who worked under the supervision of European overseers. The conscripted workers, largely men but also occasionally women and children, received no wages, and, in Rhodesia, were expected to supply their own food and equipment. Over time, however, forced labour was gradually replaced by paid workers. Both convict and conscripted road builders performed their roles poorly, the need to provide constant supervision and portable lock-ups increased the cost of convict labour, and conscription increased African discontent and caused some to leave their villages and establish encampments far away from roads and colonial surveillance. Additionally, there were protests against the practice from international humanitarian organizations, such as the Aborigines Protection Society, the Anti-Slavery Society, the International Labour Organisation and the League of Nations. By the 1930s, therefore, most African governments employed paid African labourers. In the early years of the decade, in an attempt to combat high unemployment, Rhodesia also recruited a small number of European and Indian workers.

The roads initially comprised sand and compacted earth. These materials were then superseded by broken stones and cinders, known as road metal or gravel. Heavier and faster moving traffic, which caused corrugations in the gravel, then prompted a number of administrations to adopt concrete strips. These were soon abandoned. The concrete was expensive, the sand and water required were often not available, the laying of the strips required large numbers of semi-skilled workers and highly skilled supervisors, and the resultant roads were constantly cracking, increasing maintenance costs, had relatively short life-spans, and, by giving off intense glare in strong sunlight, caused many traffic accidents. Many governments thus turned to asphalt. This was cheaper and easier to lay than concrete, had a longer lifespan, and, flexible, could adjust to soil
movements without cracking. Asphalt roads began to be built in the Gold Coast in 1919, in Kenya in 1922, and in Rhodesia from 1933.146

African construction largely occurred in Nigeria and the Gold Coast, where cocoa farmers built roads linking the cocoa producing areas to the coast.147 The growth in cocoa exports and high cost of porterage had prompted many farmers and traders to purchase lorries, only to discover that they could not be effectively operated on the existing road system and that the local administration was reluctant to improve routes. The roads were built with local labour, materials and funds, though farmers in the eastern province of the Gold Coast engaged Italian and Greek contractors to undertake the work, and, in Nigeria, were part-financed by government grants.148

The impact of motorized transport on the African economy was immense. Roads opened up areas some distance from railways and markets to commercial farming by permitting the easy transportation of produce to the railhead, and, from there, to the nearest urban conurbation or overseas.149 They also promoted the growth of a range of African handicraft industries, reduced mine labour costs by allowing companies to access workers from a wider area and at less expense, stimulated the rise of the East African Asian trader, and led to the development of brand new sectors such as motor repair, petrol retailing and transport.150 In West Africa, many of these new industries were dominated by African businessmen such as Dr Obasa, Chief Ndoma-Egba and W. A. Dawodu.151 The success of these and other entrepreneurs was related to their willingness and ability to import superior American vehicles and the reluctance of expatriate trading companies to operate public transport services or to establish their own fleets of lorries.152 African road hauliers were also more flexible than their European counterparts, being willing to vary their routes and loads, and had no set delivery timetable and could thus wait until they had a fully loaded vehicle before travelling.153 By contrast, in South and East Africa, the sector was monopolized by Europeans. In Northern Rhodesia, haulage was controlled at various times by J. E. Stevenson, Northern Motors and Messrs Smith Bros. and Kitchin; whilst, in Nyasaland, the African Lakes Corporation in 1924 established Mandala Motors, which eventually had a presence in eleven African countries.154

Economic losers from the road revolution included head porters, animal drawn freight operators, African traders who no longer had a monopoly in the previously difficult-to-access West African hinterlands and were superseded by Western merchants and Levantines, and some railways.155 Many railroads, however, ultimately benefited from motor transport, which by transporting produce to the railhead increased the amount of freight carried. Furthermore, in some regions, railway companies diversified into road haulage. In Rhodesia, for example, the Beira, Mashonaland and Rhodesia Railway formed Road Motor Services (1927), which by 1938 operated forty-four lorries around 1,600 route
miles, and, in South Africa from 1925, the South African Railways managed a road passenger and small freight transport service.\textsuperscript{156}

The influence of road transport on African society was as profound as that on the economy. On the plus side, roads led to the establishment of new towns, generally at major road junctions; facilitated migration to and therefore the growth of cities; permitted improvements in health care, the quality of education and the diffusion of information; and promoted the formation of inter-community networks.\textsuperscript{157} On the distaff side, they contributed to increased consumption of alcohol, with all its damaging consequences, strengthened racial segregation, reduced African living standards and arguably stiffened colonial control.\textsuperscript{158}

By further permitting the separation of place of residence from place of work, motor transport encouraged the establishment of African ghettos on the outskirts of towns and cities; segregation continuing to occur on the transport systems themselves.\textsuperscript{159} The long journeys to and from work on costly and overcrowded public transport also reduced the quality of life and free time of African workers and the proportion of their incomes available for expenditure on household necessities.\textsuperscript{160} Whether motor transport increased colonial control is more debateable. The use of forced labour on the construction of roads helped to discipline the unruly elements of the population, and, as discussed, the car enabled colonial officers to bring the colonial State to the people. Alternatively, visits to communities located away from the road network became increasingly rare and officers’ contact time with Africans lessened, as the car permitted them to return to their stations in the evening rather than stay in villages over night.\textsuperscript{161}

**Telegraphy**

Even today the nineteenth-century creation of the world telegraph network is an impressive achievement, involving the manufacture of hundreds of thousands of miles of cable, a large proportion of which was laid across deep ocean beds. The network was heavily subsidized by the imperial government, which recognized that the ability to transmit information in minutes as opposed to the months it usually took to ship a message to the other side of the world would permit better control and defence of the empire and promote the expansion of trade.\textsuperscript{162} The cabling of Africa was carried out by subsidiaries of the Eastern Telegraph Co. (ETC), founded in 1872 by John Pender through the merger of four existing firms. Links between South Africa and England were established in 1879 when ETC established the Eastern and South African Telegraph Co., which, with the help of the governments of the Cape, Natal and Portugal, laid a cable that connected Delgao on the north-east corner of the Cape with Mozambique, Zanzibar and Aden, where it joined the India–UK link.\textsuperscript{163} The outbreak of the Boer War in 1899, by creating a need for direct communications between the
UK and South Africa, then prompted the ETC, via the Telegraph Construction & Maintenance Co., to lay a line from Cape Town to St Helena, Ascension and St Vincent in the Cape Verde Islands, where it connected to a cable owned by a further ETC offshoot, the Western Telegraph Co., that stretched from St Vincent to Carcavelos, Portugal and thence to London. A further wire was then laid from Durban to Mauritius, where it joined the UK–Australia connection.164

Communications between England and West Africa were established from 1885 when ETC founded the African Direct Telegraph Co. (ADT). A cable was laid by the India Rubber, Gutta Percha & Telegraph Works Co. from Bathurst in the Gambia to St Vincent in the Cape Verde islands, where it connected with the St Vincent–Portugal–London link. This was followed by a second connection laid by the Telegraph Construction & Telegraph Co. from Bathurst to Bonny in Nigeria passing through Lagos, Sierra Leone (Freetown) and the Gold Coast (Accra), and, in 1893, extended from Bonny to Calabar and Duala in the German Cameroons. In 1902 and 1914 respectively, Lagos was then linked to Cotonou/Dahomey and Freetown to Accra.165 A third round of cabling occurred from 1929 when ADT was acquired by Imperial and International Communications Ltd, which formed the West African Telegraph Co. French and Portuguese colonies were connected to the Spanish national network via a cable that began at St Louis, Senegal and passed through Gambia (Bathurst), Boloma in Portuguese Guinea, and Konakry in French Guinea before terminating in Sierra Leone (Freetown). Further French and Portuguese networks were then laid, none of which passed through British territory.166

Within Africa, an 1878 proposal to link Khartoum and Pretoria was abandoned, but the idea was revived in 1892 by Cecil Rhodes who formed the African Transcontinental Telegraph Co. Financed by British investors, the firm laid a line from Salisbury to Bandawe, and later, with the help of the British South Africa Co., from Bandawe to Abercorn (1899), and, through German territory, to Ujiji on Lake Tanganyika (1903). The initiative was not as successful as hoped. Construction was slow and expensive, largely because of the high cost of transporting materials to the line and the outbreak in 1900 of a smallpox epidemic amongst the African workers. Maintenance was similarly costly. The line was carried on 14’ iron poles that were frequently pushed over by elephants and the growth of trees and other vegetation caused constant breakages and loss of current. The expected traffic also failed to emerge. In 1903, the company carried just 32,000 messages, and, in 1911, it was forced into bankruptcy, its operations taken over by the Nyasaland Co. and the Northern Rhodesian government.167 By this time, however, the baton for the cabling of Africa had been passed to the railway companies, which strung lines on posts alongside their tracks. Primarily intended to ensure the smooth operation of services, the wires additionally carried commercial communications.168
Popular Media

Whilst the railway and roads promoted physical communication, intellectual communication was facilitated through the rise of the media – books, newspapers, film and radio.

Books and Newspapers

Book reading was at first confined to Europeans, but, as missionary education increased literacy levels, spread to the African community, which read religious texts and imported and locally produced ‘trash’ fiction, the latter leading to calls for censorship. An educated minority also read British literature, often forming book clubs where they discussed the meaning of what they had read and other matters.169 Newspapers first appeared in South Africa, which developed thriving European and African presses. The first European paper was the Cape Town Gazette and African Advertiser, published in 1800 by the local administration. Its success attracted private investors to the sector, and, in 1824, the South African Commercial Advertiser appeared, followed by the first Dutch language publication, De Zuid Afrikaan in 1830. The dominant player in the market, the Argus Printing & Publishing Co., was founded in 1889 on its purchase of the Cape Argus, a liberal newspaper established in 1857 by the Cape politician Saul Solomon (1817–92). Over the next forty years, the company dominated the South African industry and acquired every English language newspaper in Southern Rhodesia and Nyasaland, and, in 1903, bought a substantial share holding in the Central News Agency, which eventually controlled newspaper distribution.170

Although the first African language publication, Umshumayeli Wendaba, appeared in 1837, the Black press only took off in 1861 with the establishment of Lovedale, which published a number of Mission newspapers aimed at black audiences, and, in 1876, allowed its Xosa language paper, Isigidimi Sama Xosa, to be edited by an African, John Tengo Jabavu (1859–1921). Jabavu, a political activist, then created his own newspaper, the English and Xhosa Inmvo Zabantsundu in 1884, the success of which led to the appearance by 1912 of seven other African controlled weeklies.171 The rise of a black-owned press, however, proved to be short lived. In the inter-war years, an upturn in African literacy levels caused European investors to move into the sector. The most successful was probably B. G. Paver, an ex-farmer who in 1921 founded the multilingual Bantu World, modelled on British tabloids. By 1934, this newspaper had a circulation of 6,000 and was itself taken over by the Argus Group. Other African papers were similarly bought out, and, by the start of the Second World War, though the country had eight Black newspapers, only three had African proprietors, two of which were published by the multiracial Communist Party of South Africa.172
The stranglehold of the Argus Group on the English language sector in South and Central Africa was matched in East Africa, by the Standard Group, founded in 1905 by the English–Austrian company Anderson Mayer to purchase the Mombasa *African Standard*, first published in 1902 by the Parsee A. M. Jeevanjee. In 1910, Standard moved this newspaper, renamed the *East African Standard*, to Nairobi and launched the *Mombasa Times*, and, in 1930, introduced the *Tanganyika Standard* – these three publications dominating the European sector to the end of the period. The first African edited and controlled newspapers were the *Sekanyolya*, founded by Sefanio Sentongo and written in Luganda, Harry Thuku’s *Tangazo*, and *Kwetu*, established by Erica Fiah, a Tanganyikan entrepreneur. There were also a number of publications aimed at the Indian community, and, in Tanganyika, at the German population.

West African newspapers had a far longer history, dating back to the 1801 *Royal Gazette and Sierra Leone Advertiser*, and were launched and subsequently failed with monotonous regularity; from 1880 to 1937 over fifty different newspapers were printed in Nigeria alone. Owing to the relatively small European population, the majority were directed at an African readership and published in Lagos, Freetown and Accra, which had relatively high literacy rates. Most were written in English, and, from the turn of the century, indigenous languages, and, until the 1920s, were weeklies. Notable examples were the *Accra Herald*, later renamed the *West African Standard*, published in 1857 by Charles Bannerman, and the Nigerian Missionary paper *Iwe Irohin* (1859). The first daily papers appeared in Lagos in 1923, Accra in 1927 and Freetown in 1933. In Nigeria, after a period of intense competition, the *Nigerian Daily Times*, established in 1926 by three Europeans and an African, emerged triumphant and remained the dominant newspaper until 1937 when its circulation was exceeded by the *West African Pilot*. Founded by Nnamdi Azikiwe (1904–96), who later became the first president of the country, the paper mixed the promotion of Nigerian nationalism with a populist style borrowed from the British press. Azikiwe’s company, the Zik Group, then launched a number of local city newspapers, and, in 1934, the *West African Standard*, which was aimed at a Gold Coast readership. Containing a mixture of nationalist politics and popular features, the newspaper rapidly made in-roads into the circulation of the market leader, the *Gold Coast Independent*, a more conservative product founded in 1918 by Dr Frederick Nanka-Bruce, who again later entered politics.

The impact of black newspapers on local populations was great. Virtual communities of educated Africans were created, which through newspaper advertisements and descriptions of social events often became actual communities; many readers forming societies or friendship networks with fellow subscribers. The papers gave such people an identity and a status, a way of distinguishing themselves, and made them aware of regional and international affairs and their
place in the world. More significantly, they became a mouthpiece through which the educated African could criticize government policies that adversely affected themselves and their peers and demand reform and greater involvement in the administrations of their countries. The very existence of the newspapers also clearly demonstrated to European communities that some of their pre-conceived notions of the intellectual abilities of the African were mistaken. For the less educated, who often attended public readings, they provided a guide to the vagaries of urban life and much-needed entertainment and gave them greater political insight and a reason to become literate themselves.

**Film**

Movies had a similar impact on the black population, providing escapism from the harsh realities of life, promoting social interaction, generating an identification with and empathy for Europeans, and permitting the expression of status; better-off Africans attended genteel cinemas or sat in relatively highly priced balcony seats. They also had more negative consequences. Europeans blamed them for the spread of immorality and crime and American and British culture soon began to suppress African customs and mores. On the Northern Rhodesian copper belt, for example, young men began to adopt the dress and slang expressions of Wild West cowboys.

Films were shown by cinema societies in hired recreation halls, and, increasingly, in cinemas owned by local, and, in East Africa, often Indian businessmen. At first, the movie houses were located in the cities and later in provincial towns in existing and then purpose-built buildings. Areas too small to support a permanent theatre were periodically visited by mobile cinemas, which exhibited films in large tents. To attract audiences, the auditoriums also housed variety shows and were meeting places for community groups and many owners advertised the arrival of a new movie through the use of street entertainers and parades.

The majority of the films screened were British or American, though in East Africa, where there was a large Asian population, Indian movies were popular. Most were distributed by local companies; in South and East Africa by African Films Ltd. A South African company, this acquired European movies that had been shown in South Africa and distributed them first to Nairobi, then to cinemas across Kenya, Uganda and northern Tanganyika, and, finally, to Dar es Salaam and Zanzibar. The only African film producer, apart from local colonial administrations, was the Bantu Educational Kinema Experiment (BEKE). Established by the International Missionary Society to operate a chain of cinemas showing educational films, BEKE then changed direction and began to produce its own movies. From 1935 to 1937, thirty-five films were made, none of which proved popular with African audiences.
Inevitably, there was much official concern about the possible impact of Western films on the unsophisticated and supposedly impressionable African mind. In 1929, the Colonial Office established a colonial films committee to investigate the matter, which proposed the establishment of a central film censorship body and set out censorship criteria that should be adopted throughout the empire. Its recommendations, however, were rejected by the Colonial Office and the censorship issue was thus passed to local administrations. The extent to which these tackled the problem varied between regions. Censorship was most strict in South Africa and Tanganyika, where films were graded as suitable for ‘Europeans’ or for ‘natives’ or were banned outright. Elsewhere, local censors cut scenes from films that depicted crime, interracial violence or general immorality.

Radio

The wireless probably had less of an impact on African audiences than either newspapers or films. Initially, most regions listened to programmes produced by the BBC Empire Service, renamed the Overseas Service in 1939 and beamed to Africa from a permanent short wave transmitter erected at Daventry in 1928. The broadcasts were targeted at European audiences and comprised repeats from the domestic service and specially created features. Their aim was to allow expatriates to maintain contact with events at home, to remind them of the purposes and ideals of the empire, and to prevent the development of regional loyalties.

Local broadcasting only emerged in East Africa and South Africa. In Kenya, the British East African Broadcasting Corporation began operations in 1929, and, three years later the government gave a twenty-five-year licence to the Imperial and International Communication Ltd. In South Africa, the first broadcasting licences were issued in 1923 to the Cape Peninsular Publicity Association, the Durban Corporation and the Johannesburg Association of Scientific and Technical Societies, which received most of their funding from the proceeds of the sale of radio receiving licences. All began broadcasting and rapidly found themselves in financial difficulties, as few listeners bothered to buy receiving licences, aware that the system was un-enforced. The Johannesburg service halted broadcasts in 1927 and was replaced by the American financed African Broadcasting Corporation (ABC), which took over the Cape Town and Durban services on the expiration of their licences. The government, however, became increasingly concerned at ABC’s output, and, after commissioning a highly critical report from Sir John Reith, the head of the BBC, in 1936 took over the Corporation creating its own South African Broadcasting Corporation (SABC). SABC’s English and Afrikaans programmes strongly supported government policies and were aimed at a white audience, though attempts were made to engage African listeners. In 1939, the musical Chief Above and Chief Below, adapted from an
African folk tale was transmitted, and, later, programmes in Zulu, Xhosa, Sesotho and Tswana were broadcast.\footnote{188}

**Conclusion**

Although Britain’s development of a transport infrastructure during the colonial period benefited the imperial economy, it had little impact on African well-being. The high cost of railroads precluded construction by the private sector and most were built by local administrations, whose poverty forced them to obtain the necessary finance from the City of London. They were thus saddled with large high interest sterling debts, which were met through the taxation of local populations and the increased production of cash crops, arguably at the expense of economic activities that would have proved more useful to economic development. Of the money raised, little found its way to Africa. The skilled staff and the materials required for the construction and operation of lines all came from the UK. There were therefore few backward linkages for local economies and the only involvement of Africans was usually as poorly paid and sometimes badly treated labourers.\footnote{189}

The communications ‘revolution’, similarly, failed to lay the foundations for sustainable post-colonial growth. On independence, many ex-colonies inherited relatively small railway networks; apart from South Africa, few possessed more than 500–600 miles of track. In South and East Africa, to reduce costs and speed construction, colonial engineers had avoided building tunnels, embankments, bridges and so on. Many lines thus had sharp curves, steep inclines and roundabout routes, which, along with the cheap lightweight rails used, limited train speeds and carrying capacities and increased maintenance costs.\footnote{190} West Africa, by contrast, thanks to the department system, was left with a number of overly expensive high quality railroads that had little chance of recouping their capital costs. Moreover, constructed to permit the export of raw materials, most lines headed to the coast and regions with little agricultural potential possessed few railheads. Little or no attempt had been made to link countries, especially where they were governed by different colonial powers, and each administration/power had adopted a different gauge(s).\footnote{191} A unified railway system, inter-African trade and the development of well-rounded economies based on the production of a range of goods were thus impossibilities.

Other forms of transport were equally inadequate. Because the colonial authorities believed rail possessed a comparative advantage, road systems were cheaply and poorly constructed and relatively modest, often comprising a few routes absolutely necessary for colonial governance, again making the development of local industries difficult.\footnote{192} Likewise, British Africa had few seaports, each export region requiring just one port to funnel goods overseas, hardly any
domestic air routes, international air connections to only a few European cities and a shipping sector controlled by monopolistic cartels. To misquote the title of the song by the 1980s group Talking Heads, Britain’s colonial transport policy put Africa on ‘the road to nowhere’.

Notes
3. T. Zeleza, A Modern Economic History of Africa. Volume One. The Nineteenth Century (Dakar: Codesria, 1993), p. 287. However, Asante caravans were relatively small and Maraka caravans carried their own food (ibid., p. 287).
8. In West Africa, a porter carrying the average load of 60 pounds was estimated to walk 15 miles per day (Chaves et al., ‘Reinventing the Wheel’). Some dispute that deserters stole their loads, arguing that porters were self-regulating groups and that deserters were expected not to steal their loads and to leave behind any wages received in advance (Rockel, Carriers of Culture).


General Introduction

24. Source: Ibid., p. 307
25. Source: Ibid., p. 306
27. Ibid., pp. 107–10.
31. Ibid., pp. 124, 110–11.
32. Ibid., pp. 125–8.
35. Ibid., pp. 120–2; Pflaumer, 'The Politics of Transport'.
36. Source: Sunderland, Managing the British Empire, p. 100.
37. Ibid., p. 123.
39. Ibid., p. 137.
40. Ibid., pp. 137–8.
41. Ibid., pp. 138–9.
43. Sunderland, Managing the British Empire, p. 143.
48. The three railways were known respectively as the Cape Western, Cape Midland and Cape Eastern lines.
50. Pirie, 'Railways and Labour Migration'.
51. Ibid.; Meredith, Diamonds.


61. The Gold Coast Sekondi–Tarkwa line was almost wholly financed by current account advances (Dumett, ‘British Imperial Transport Management’). Prior to the inter-colonial loans scheme, the Sekondi–Kumassi line was partly funded by the creation of £0.063m of 3 per cent Gold Coast stock, bought by various colonial Investment Funds, and the Northern Nigerian Baro–Kano line by Southern Nigerian advances borrowed at 3.75 per cent (Sunderland, Managing the British Empire, p. 215).

62. Sunderland, Managing British Colonial and Post-Colonial Development, p. 50. Each year, a borrowing colony placed a certain amount into a Sinking Fund, and, at the end of the loan’s life, the contents of the Fund were used to repay the capital.

63. Sunderland, Managing the British Empire, p. 216.

64. This was not the case in French West Africa, where many lines were constructed privately. The Dahomey and Togo railways were built and run by private firms, assisted by government loans (C. Newbury, The Western Slave Coast and its Rulers (Oxford: Clarendon Press, 1961), p. 143). In the case of the Dahomey line, the road bed was laid by the government and the permanent way by the Dahomey Railway Co. The Konakry–Niger railway was initially constructed by contractors, and, after the cancellation of their contract, by military engineers (Sunderland, Managing the British Empire, p. 101, footnote 15). Indian railways were also built by private companies until 1869, when the government took over construction. From the mid-1880s, the private sector was again used, though state construction continued (J. Kerr, Building the Railways of the Raj, 1850–1900 (Oxford: Oxford University Press, 1995)).

65. Sunderland, Managing the British Empire, p. 140. Similar incentives were offered in India, Russia and Latin America (P. Luntinen, Railway on the Gold Coast. A Meeting of Two Cultures (Helsinki: Suomalainen Tiedeakatemia, 1996), p. 21).


84. Anderson, *British Engineers and Africa*.
85. Ibid.
93. Sunderland, *Managing the British Empire*, pp. 55–6, 60–1, 64. 31 per cent of the large orders listed in the 1937 *Ministry of Labour Gazette* went to just 5.5 per cent (twenty-nine companies) of all the businesses used, and 43 per cent of the firms that won orders were based in the south-east (Sunderland, *Managing British Colonial and Post-Colonial Development*, pp. 127–8).
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109. Taaffe et al., 'Transport'.


119. Wrangham, 'An African Road Revolution'. In 1923, Gold Coast road freight rates were 1s 9d per ton mile for long distances, as compared to railway rates of seven pence and a halfpenny per ton mile for the first 50 miles and 2d per ton mile after 150 miles (ibid.).


121. Green-Simms, 'Postcolonial Automobile', p. 25. These fears were also shared by African Chiefs (ibid.).

122. Pedersen, 'Development of Freight Transport'.


126. Alois, 'From Dirt Tracks'.


128. Bennett, An Informal History; Green-Simms, 'Postcolonial Automobile', p. 25; Alois, 'From Dirt Tracks'.

129. Makgala, 'Limitations'; Bennett, An Informal History; Wrangham, 'An African Road Revolution'.

130. Wrangham, 'An African Road Revolution'; Alois, 'From Dirt Tracks'.

131. Ibid.


137. Bennett, An Informal History; Alois, 'From Dirt Tracks'.

138. Green-Simms, 'Postcolonial Automobile', p. 27.
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142. Alois, ‘From Dirt Tracks’. In 1934, the Roads Department employed thirty-four European and thirty-five Indian labourers (ibid.).

143. Bigon, ‘Sanitation’.


146. Alois, ‘From Dirt Tracks’; Bennett, An Informal History; Pedersen, ‘Development of Freight Transport’; Bourret, Ghana, p. 30. In Rhodesia, by 1938 1,182 miles of asphalt road had been constructed (Alois, ‘From Dirt Tracks’).


152. Green-Simms, ‘Postcolonial Automobility’, p. 30. Expatriate companies and governments bought European models for patriotic reason and because they had signed long-term purchasing contracts (ibid.).


157. Gewald, *The Impact of Motor Vehicles*, pp. 8, 9; Erim and Ajor, ‘The Indigenous Factor’; African health was further improved by the greater supply of agricultural produce (Olubomehin, ‘Road Transportation’).


168. Ogonda, ‘Transport’, p. 136; Falola and Heaton, *A History*, p. 120.


175. In Tanganyika, Indian papers included the Tanganyika Opinion (1923), written in English and Gujarati, the African Comrade (1926), and the Tanganyika Herald (1929). German language papers included the Tanganyika Zeitung (1928), the Das Hochland (1930), and the Die Ostafrikaner (1938) (M. Sturmer, The Media History of Tanzania (Salzburg: Ndanda Mission Press, 1998), pp. 50, 52–3).


184. Ibid.

185. Ibid.


191. A. Okoth, *A History of Africa, 1855–1914* (Nairobi: Bookwise Ltd, 1979), p. 332; Headrick, *The Tools*; Hilling, *Railways*. Only two lines appear to have crossed national frontiers – the German Tanga line in 1916 was linked to the British Mombasa railway, and, earlier, the Cape line was extended into German south-west Africa (Njoh, ‘Implications of Africa’s Transportation Systems’).
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African railways were constructed for economic, administrative and political reasons. Economically, they permitted the exploitation of mineral resources and agricultural produce. In West Africa, they were built to allow the development of the Sierra Leone Tarkwa and Obuasi gold mines, and, in Nigeria, the tin found on the Jos Plateau and the Udi coalfields. Gold and coal were also the reason for Rhodesia’s Bulawayo–Salisbury and Bulawayo–Wankie lines, respectively; whilst lead/zinc, copper, chrome and soda ash provided the impetus for the Broken Hill section, the extension to the Congo border, the Umvukwes branch and the Kenyan Konza–Magadi line, respectively. Gold and coal, along with diamonds, were similarly the spur for much of the South African network. As for agricultural produce, in West Africa the cultivation of palm fruit was an impetus behind the Sierra Leone railway, cocoa the Gold Coast Accra–Kumasi and central Province lines and cotton the Nigerian Lagos–Kano extension. To the south and east, railways were largely built to encourage European mixed farming, though cotton was again an important motivator for the Uganda Busogara railway, sisal for the Kenyan Voi–Taveta link with Tanganyika and the Nairobi–Thika tramway, grapes the Cape Town to Wellington line, and timber the Cape Knysna–Deepwalls and Rhodesian Zambesi Saw Mills railroads.

A number of actors promoted construction. Various groups such as the British Cotton Growers’ Association and commercial firms aggressively lobbied the imperial government for the laying of lines. As discussed in the General Introduction above, they were supported in the Crown colonies by the Crown Agents and their consulting engineers, both of whom gained materially from construction and used the economic failure of lines as reasons for building extensions. In Nigeria, for example, Frederic Shelford claimed that the Lagos–Otta line, which was not expected to cover debt charges, would be successful if an extension was built to Ibadan. On the completion of the extension, which covered neither its own nor the original section’s costs, he advised that the two lines would be remunerative only if a further extension was built. Likewise, in Sierra Leone, he warned the Colonial Office that, unless the Freetown–Songotown line was extended, ‘the money spent will be more or less thrown away’, causing a Colonial Office offi-
cial to conclude that ‘we have gone so far that we cannot stop’. A similar state of mind ruled in Rhodesia, where the British Africa Co. extended the railway to the Congo border in the hope that the resultant development of the Katanga copper fields would generate sufficient traffic to allow them to meet the cost of financing the Beira railway and overcome the losses of the Broken Hill line.

Generally, the Crown Agents and consulting engineers were supported by colonial governors, who were well aware that the resultant expansion of trade and their operation of the railway would increase customs, tax, freight rate and land grant royalty revenues, and permit them to further stimulate development through the introduction of agricultural schemes and the construction of ports and harbours and to improve the lives of both European and African residents through the provision of medical and educational facilities, water and sewage works and so on. Such initiatives justified their existence and would improve their social standing, both in the colony and when they returned home, and, more importantly, would increase their chances of gaining a posting to a more important colony/protectorate. They were also aware that railways would allow them to govern effectively and efficiently, enabling administrators to travel into the interior, and, by permitting the rapid movement of troops, would help to maintain the political stability that was required by Europeans investing in the continent. Colonial administrations, in turn, were supported by their legislative councils, which largely composed of merchants, similarly had self-interested motives for the laying of lines.

Apart from economics, the British government and local colonial administrations had other reasons for constructing railways. The imperial government wished to demonstrate the might of the empire to Africans resistant to British control and to protect its interests on the continent from other European powers. The impetus behind the Uganda Railway, for example, was to secure the Nile against the Germans, who controlled neighbouring Tanganyika, and, to a lesser extent, the French and the Belgians, and the Nyasaland Port Herald to Blantyre line was constructed to counter Portuguese and American commercial threats. HMG also saw railways as a way of integrating their often disparate possessions on the continent and of providing a humanitarian cloak behind which their baser economic/political motives could be hidden. A supposed reason for the construction of the Uganda railroad, for instance, was the suppression of slavery via the removal of human porterage, and it was widely held that infrastructure would bring ‘civilization’ to the ‘heathen’ by permitting the spread of Christianity and Western education.

Notes


PART II. – GOLD COAST.

MESSRS. FITZ-GERALD and MERCER to COLONIAL OFFICE

10,083. No. 1.
22, Buckingham Street, W.C.,
June 23, 1879.

Sir,

Connected for many years past with British West Africa, and having closely watched the progress of the several territories, the impediments that restrain, and the aids that would impel it to results beneficial at the same time to the merchant and trader, the population at large, and the public revenue, we have the honour to bring the subject of railways in the Gold Coast Colony under your special notice, with the view of obtaining from Her Majesty’s Government the necessary concession for constructing these railways, in addition to such material and moral aid and assistance as the Government of the Colony could bestow without prejudice to any existing interest, and with reasonable certainty of a large increase in the public revenue.

2. A dissertation on the advantages to be derived by railway communication and transport would be impertinently superfluous at this advanced period of the nineteenth century. A comparison of the present condition of Great Britain, of Europe generally, of the United States of America, and other countries now and fifty years ago, exhibits these advantages in so powerful a light that no word of comment can be needed. But, considering the question with reference to the introduction of railways into the West African territories, it must be borne in mind that Great Britain and the other countries above alluded to were already possessed, before the introduction of railways, of elaborate and more or less perfect systems of
transport for people and goods by a network of good common roads, canals, and navigable rivers; while the Gold Coast territories of which we are now particularly treating are totally devoid of all common roads, almost equally so of river navigation, entirely so of canals, and without any mechanical facilities for the conveyance of produce exported and goods imported from and into the interior, all the traffic being on foot, and the produce and goods borne exclusively on human heads to and from the coast, in loads of 40 and 50, up to 70 lbs. each.

3. That such countries have progressed at all with such a total absence of facilities for the transport of goods and produce denotes the ardent desire of the people to acquire imported manufactures and other foreign goods, and points incontrovertibly to an enormous increase of production, and, consequently, of commerce and public revenue, when railways shall transport the produce and goods, and also passengers, and the tens of thousands of human carriers shall be continuously engaged in production instead of in transport.

4. Owing to peculiarities of the Gold Coast climate beasts of burden cannot be employed, so that any system of common roads would confer but little benefit, and be comparatively inoperative; which is fully borne out by the experience acquired by the Ashantee expedition under Sir Garnet Wolseley in 1873–74.

5. As produce for the most part can only be brought to the coast for shipment within a very limited distance, because of the difficulties and cost of transport on human heads, with the constant liability to loss by the breakage of the oil pots, and other accidents in the bush, the result of the railways we propose to make, by extending so as perhaps to double the area of profitable production, may be regarded as certain to double the exports, imports, and public revenue of the Colony.

6. In consequence of the difficulties of intercommunication, the dispersed population (remnants of once powerful tribes), who were in almost constant hostility under the provocative temptations of the now happily abolished foreign slave trade, remain in their isolated villages, comparatively ignorant of each other, and hostile to each other, each the prey of the abominable local as well as general superstitions, and of the infamous cheats exercising supposed powers of medicine and over witchcraft.

7. It ought to be, and we are certain must be, deemed equally desirable in the mind of enlightened statesmen, as it is in that of secular and Christian philanthropists, that these scattered populations, separated by some repellent influences, should be brought into easy and constant communication, and gradually, as would result from such intercommunication, be welded together, and elevated to the status and condition of a people, a condition in which individuals act and re-act upon individuals, to the destruction of ignorant and barbarous superstitions, the increase of intelligence, and the advancement of industry, civilization, and Christianity.
8. Confident that we shall have the enlightened sympathy and obtain the countenance and support of Her Majesty’s Government, which cannot fail to desire the rapid progress of material and moral development in a Crown Colony, we have for some months past resolutely devoted ourselves to the work of endowing the Gold Coast Colony with those lines of railway which appear to us to be most remunerative, as shown by the Circular herewith attached.

9. Ardent as our desire is to introduce these absolutely indispensable aids to material development and progress, to the growth of civilization, and the spread of an ennobling Christianity, we should not have entered upon this work of their construction had we not convinced ourselves that, built on the most approved modern principles for economical light railways, these projected lines will prove remunerating to the capital employed as well as beneficial to the people, as well as materially increase the trade, commerce, and revenue of the Colony. But important above all at the present time is the fact that these lines will open and afford easy access for passengers, tools, machinery, provisions, and general stores, to the rich gold districts. Only those who have acquired a knowledge of what the undeveloped gold resources of this Colony, in which scientific mining is only now commencing, really are, can properly estimate the success that these lines will attain. There can be no doubt that, aided by the facility of transport, the production of gold in this Colony will amount to many millions of pounds sterling per annum, which will help to remedy the evils that Her Majesty’s Principal Secretary of State lately described as being caused by the diminished yield of the gold-fields of Australia and California.

9a. In conclusion, we have now the honour to submit herewith, for your favourable consideration, the terms of concession which appear to us to be indispensable for the necessary introduction of the capital required for the construction of the proposed light railways.

We have, &c.,

(Signed) F. FITZ-GERALD.

The Right Hon. Her Majesty’s

Principal Secretary of State for the Colonies,

&c., &c., &c.
Enclosure 1 in No. 1.

CIRCULAR.

22, Buckingham Street, Strand, W.C.,


Light Railways – West Africa.

HAVING been connected with the Public Works Department of the Crown Colony of the Gold Coast, extending from 5° W. to 2° E. longitude, and averaging inland about 60 miles, with a population of 400,000, entirely under the jurisdiction of the Crown, I have had ample opportunities of observing what class of public works are most needed in this new Colony, which was constituted in 1874, for the development of its commerce, agricultural and mineral products, and for the employment of the large population that was only freed from the bonds of slavery five years since.

2. Since my retirement from the Public Service, I have been engaged, in conjunction with Mr. Fitz-Gerald (Editor of the ‘African Times’), in preparing a scheme for the introduction of light railways in the Settlements on the West Coast of Africa; and being fully Convinced that Her Majesty’s Government would recognise any project for developing the resources of the country, if strong representations are made by gentlemen of position and experience, I respectfully solicit your valuable support and co-operation in obtaining the sanction of the Secretary of State for the Colonies for the power of constructing these most useful and necessary public works. /

3. The financial and commercial prospects of the proposed undertaking are most encouraging, as the extracts from official papers fully bear out, viz.:–

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The above figures are for the Gold Coast alone, and in the year when trade had only commenced to revive after the Ashantee Expedition of 1873–74.

The imports consist of cotton goods, spirits, tobacco, hardware, haberdashery, silk goods, and spice; and the imports of gold dust (bullion), ground nuts, gumer grain, gum copal, ivory, palm oil, palm kernels, monkey skins, &c. In tonnage and value the Lagos trade may be taken at double the above figures for the same year.

The revenue of the Gold Coast in 1869 was 24, 127l., and expenditure 18,836l. In 1877 the revenue was 92,347l. and expenditure 82,741l. – surplus
9,806l. sterling, showing a clear increase of nearly 25 per cent, per annum for eight years; and I learn on good authority that this prosperity has continued during the past year, 1878, the Gold Coast having realised nearly 100,000l. and Lagos nearly 60,000l.

Taking into consideration these official statements, there is every reason to hope that, by the introduction of better means of transport, instead of carrying every ounce weight of exports and imports on the heads of women, men, and even young children, a proportionate increase of production and consumption may reasonably be expected.

4. With a view of meeting the immediate requirements of the Colony, we propose to lay down four single lines of light railway:–

(1) From Chamah to the gold mines in Wassaw, where two concessions are in full work on English capital. This length is about 50 miles, and passes through the auriferous and oil districts of Secoudee, Dixcove, and Ahanta.

(2) A short line of 20 miles, from Salt Pond to Mankessim, through the centre of an oil district. This will eventually terminate at Elmina.

(3) A line of 40 miles from Acera, running through the most healthy districts of the Gold Coast and the largest palm plantations to Kpong on the Volta; with ultimate extension to Salaga, the centre where caravans meet from the Niger Towns, Timbuctoo, &c.

(4) A line from Garru on the Oguno at Lagos to Abeokuta in the interior, about 40 miles.

The total length of these lines is about 150 miles, with landing-places, warehouses, and hulks at the seaports, Chamah, Salt Pond, and Accra.

5. From personal experience of the country, I am satisfied that a narrow gauge line of 36-1b. rails will suffice for all the traffic for some years to come and the country, though hilly, is principally covered with low hills of short ranges, so that a railway line could always be selected with low and short embankments; and, there being no rivers of any size to cross, the lines could be completed for 2,500l. per mile. When the concession is secured, the shares taken, and surveys and plans approved, I am disposed to think that the prosperous state of the Colonies would induce the Government to guarantee a fair percentage on the cost of the works, which I estimate at 500,000l.; a 4 per cent. guarantee on which is equal to 20,000l., and this amount nearly represents the surplus revenue over expenditure for the past two years.

6. To assure the promoters of the success of this undertaking, it is only necessary to point out the recuperative powers of the lines in goods traffic alone; and for this purpose I select the shortest line as a test, Salt Pond, with a trade of 20,000 tons per annum, exports and imports inclusive; the transport, 20 miles
at 6d. a ton, equals 10,000l., to which, adding 2s. per ton storage in warehouses and hulks, gives 2,000l., or total receipts of 12,000l. Taking the construction and maintenance of this line, warehouses and hulks, at 70,000l., and deducting working expenses, 50 per cent, on 12,000l. (the gross earnings), leaves a balance of 6,000l., or about 8 1/2 per cent. on the outlay of 70,000l. exclusive of passenger traffic. Now, if I analyse these charges, I find there is a large margin for higher rates than 6d. per ton and 2s. per ton for storage. Thus, the weight of palm oil is about 7 1/2 lbs. per gallon of 300 per ton, and the average weight carried by an adult is 60 lbs. It therefore takes 37 adults to bring a ton of produce to the coast. The hire of these men, if only paid 3d. per day for their subsistence for two days to and fro, amounts to 18s. 6d., exclusive of any wages; and the charge of 2s. per ton for warehouse and hulk storing will compare favourably with the rate charged by Government for bonding in Government stores.

7. As the ultimate success of this undertaking depends upon what support we can obtain from the Government, I shall be glad to learn if you will allow me to add your name to the list of supporters who are willing to co-operate or recommend the project now brought to your notice.

I have, &c.,

(Signed) Wm. Mercer, Asste. Mem. Inst. C.E.,
West African Merchants.
late Colonial Surveyor, Gold Coast.

Enclosure 2 in No. 1.

Draft Memorandum of Terms and Conditions of Concession for Light Railways, Gold Coast, West Coast of Africa.

1. The concession to be in force for 21 years from date of grant.
2. Terms:–
   (1) The grant of all lands and waterways 500 yards on each side of the central line of the single line of railway.
   (2) The sole and absolute right of the Company to work any quarries, waterways, mines, forests and lands within the above lines of limitation.
   (3) Power to lease, allot, and sell any land that has been cleared, cultivated, planted or worked by the Company.
   (4) Power to build warehouses and landing-places on the sea coast, and to keep hulks at anchor in roadsteads free of harbour dues, rates, and taxes.
   (5) To land, free of duty, all materials and appliances for the construction and maintenance of the railways, stations, hulks, &c.
(6) Full power to levy rates, tolls, rent, &c., on all traffic carried by or along the lines, or deposited in the stations, &c., or taken on board the hulks, and to appropriate the same free of duty or tax.

Conditions:–

(1) That the survey plans, &c., approved by two Civil Engineers of note, shall be deposited with the Crown Agents within two years after the concession has been granted.

(2) That the several lines shall be completed within five years after the approval of the said plans by Her Majesty’s Secretary of State for the Colonies.

(3) That the Company shall deposit 4 per cent. of their capital as caution money when the Government of the Colony grants an annual subsidy from the local revenue, for the true and faithful execution of the works as shown by the plans.

(4) The local government shall have full right to purchase the lines and rolling stock, &c., at the expiration of the concession; and that, in consideration of the subsidy, the Government shall be entitled to one-half of the surplus nett revenue of the Company, after paying 6 per cent. on the capital (inclusive of the subsidy).

(5) That the Company shall pay a royalty of 1s. per ton of 20 cwt. on all minerals worked or exported; and a nominal rent on all lands cultivated within the prescribed limits.

(6) That the Government shall have power to examine the accounts of the Company after each half-yearly report has been issued.

(7) That the concession be granted jointly to William James Mercer, Civil Engineer, and Ferdinand Fitz-Gerald, Esq., and that the provisions, guarantees, &c., entirely lapse at the end of two years, provided they fail to comply with Clauses 1 and 2 of No. 3 of the Concession or Agreement.
No. 2

COLONIAL OFFICE to Messrs. FITZ-GERALD and MERCER.

Gentlemen,

Downing Street, July 11, 1879.

I am directed by the Secretary of State for the Colonies to acknowledge the receipt of your letter of 23rd June,* asking for a concession of privileges, &c., for the construction of railways on the Gold Coast.

Sir M. Hicks Beach\(^2\) desires me in reply to state that, although he would desire to see the development of the Gold Coast Colony advanced by the establishment of such improved means of communication with the interior as a railway would afford, the scheme placed before him in your letter is of too general a character to be entertained by Her Majesty Government, even if they were in a position to make the proposed concessions.

Except in the immediate neighbourhood of forts and towns the country of the Gold Coast belongs not to the Crown but to independent kings and tribes; and Her Majesty’s Government could not undertake either to make grants of land or to secure persons constructing a railway from interference and danger. Sir M. Hicks Beach does not perceive how this preliminary objection to your proposal could be overcome; but, in any case before a proposal for railway construction could be considered, it would be necessary to show that responsible persons were prepared to provide the requisite capital, and to submit the details of the particular works contemplated.

I am, &c.,

F. Fitz-Gerald, Esq. (Signed) ROBERT G. W. HERBERT.

W. Mercer, Esq.

* No. 1.
Reports on Inspections Made to Ascertaín the Best Lines of Possible Railway Extension in the Colony. No. 1, Possible Extensions of the Western and Midland Systems (Cape Town: Department of Crown Lands and Public Works, 1879).

CAPE OF GOOD HOPE.
Department of Crown Lands and Public Works.

REPORTS ON INSPECTIONS
MADE
TO ASCERTAIN THE BEST LINES
OF POSSIBLE
RAILWAY EXTENSION
IN
THE COLONY.
No. 1. – POSSIBLE EXTENSIONS OF THE WESTERN AND MIDLAND SYSTEMS.

Presented to both Houses of Parliament by command of His Excellency the Governor. JUNE, 1879.

[...]

Cape Town, 30th April, 1879.
W. G. Brounger, Esq., Railway Engineer.

Sir,—In compliance with the instructions contained in your letter No. 409 C of the 23rd October, 1878, I have examined the country with the view to possible railway extension between the Midland and Western Systems of Railways, and the Orange River, and I have now the honor to submit to you the following report of my inspection, and approximate estimates of the cost of the work:— /

[...]

Generally speaking the heights have been taken by Aneroid,¹ and the distances by Trochometer,² or by pacing, and the results are of course only approximate.³

In cases, however, where there appears to be any doubt as to the practicability of the country for a railway within the prescribed limits of gradients and curves, trial chain surveys have been made, and the levels taken.

The prices of labour and of transport, on which the estimates are based, are about the average of those prevailing on the Beaufort West Extension Railway in course of construction.

The prices of permanent-way material are those at present quoted in England, and are exceptionally low, and unless the work is proceeded with at once, there must be some addition allowed to this item.

Throughout the whole of the country which I have inspected, there is a great scarcity of a permanent supply of water, and I have allowed an extra of £100 per mile, in the estimate, on this account.

The estimates are calculated to cover work and material of every description required to complete and equip the railway, including the first cost of rolling-stock. The cost of land and fencing is not included.

I now proceed to describe generally the work on the different lines.
Route No. 1. – Beaufort West to Hope Town Direct.

Estimated distance, 224 miles; sidings, 11 miles; total, 235 miles.

The line will leave the Beaufort West Extension Railway, at a point about 228 ¼ miles from Worcester, that is, about ¼ mile from the proposed station at Beaufort, and will cross the Gamka River about 100 yards above the road drift, at the southern entrance to the town, by a bridge of 150 feet waterway, and it will then cross the main street by a level crossing, and the stream from the reservoir by a bridge of 50-feet span.

The line will then pass over perfectly easy country, with light work, and no gradient steeper than 1 in 70, and only a short length of that, to Rhenoster Kop Farm.

From here to the foot of Reim Hoogte, the work is still light, but a mile of heavy work will be required to reach the point on the summit of Reim Hoogte, about 25 ½ miles from Beaufort West, where the lines to Hope Town and Richmond diverge.

Thence the Hope Town line can be taken through Courlands Kloof, with less than 9 miles of moderately heavy earthwork. It will be necessary to cross the stream in the kloof, at least three times, but the bridges required will not be of an expensive character.

After leaving the kloof the work for 5 miles is light, and with easy gradients, and the line then crosses the Salt River, by a bridge with 150 feet waterway, near Kalk Val, about 39 miles from Beaufort West.

From Kalk Val the line follows the general direction of the road to Victoria West, as far as the ‘Old Stable,’ about 45 ½ miles from Beaufort West, and then diverges to the east, and runs up the valley to Noblesfontein.

To 55 ½ miles the work is still light, but near the homestead at Noblesfontein, there will be a mile of heavy work, chiefly in rock, with steep gradients.

After passing this point, the line reaches a summit 62 miles from Beaufort West, dividing the drainage areas of the Salt River and Ongers River, near Matjesfontein Farm, and leaving Eendvogelfontein about a mile to the left, at 64 ½ miles, then passes Beisjesfontein Farm at 76 miles from Beaufort West. From Noblesfontein to this point, the work and gradients are moderate.

If this route be adopted, a Station for Victoria West will have to be placed here; the distance from the town will be a little more than 6 miles, and over a good road.

From Biesjesfontein the line passes near Klein Bosmans Poort, and Slaghtbergs Farm, and the Ongers River is reached at 105 miles from Beaufort West, where a bridge of 160 feet waterway is required. The work to this point is of the lightest description, and with easy gradients.
At 113 miles the line passes near Lieuwkuil Farm, where a 30-feet bridge is required, and the work continues moderately light, till a rocky neck is reached at 119 ½ miles, where about a mile of heavy work will be necessary.

From Nieuw Jaars Fontein (126 miles) the work is moderate in quantity, but partly in rock.

Thence to 183 ½ miles the work is little more than forming, and nearly all in soft ground, and over a level country.

The line passes near the under-mentioned Farms: Reit Poort, 128 miles; Dreunfontein or Kalkenberg, 135 miles; Brakfontein, 147 miles.

This point (Brakfontein) is only about 4 miles to the east of Brits Town, and a station might be placed to advantage in this neighbourhood.

At 160 miles the Brak River will have to be crossed, and a bridge of 150 feet waterway will be required.

At 164 miles near Matjesfontein a bridge of 120 feet will be required over a branch of the Brak River.

At 172 miles the line passes within a short distance of Rhenosterfontein Farm, where there is a spring, which yields an abundant and constant supply of good water. Lime of good quality is also to be had in abundance.

A bridge of 120 feet waterway will be required over the Rhenoster River.

Rietfontein Farm is reached at 179 miles, and Whirlwind Poort at 183 ½ miles from Beaufort West.

Here, Whirlwind Poort 1 ½ miles of somewhat heavier work, partly rock, will be required, but after that the work as far as Hope Town is little more than forming.

The line passes Quaggas Pan at 189 miles, Biesespet Farm at 194 ½ miles. Paardepet at 200 miles, and Kaffirs Dam at 203 miles from Beaufort West.

At 221 miles I propose to place the station for Hope Town about 1/2 mile to the west of the church, where the ground is in every way suitable.

The total length of the line to the Orange River is 224 miles.

There is an excellent site for the bridge about 1 mile below the pont, and 1 ¼ miles above the road bridge at present in course of construction. The line could be brought here without heavy work, and the bed of the river is of rock, and most favourable for foundations of abutments and piers.

The approach to the bridge, on the farther side of the river, could also be formed without heavy earthwork. It would be possible to take the line to the bridge now in course of construction, but this would entail some extra distance, and a considerable increase in the earthwork. A rock-cutting 30 feet in depth would be required to get a gradient of 1 in 40 on this side of the river, and the work on the farther side would also be heavy.

Speaking generally of this route, the country is in nearly all respects most suitable for making a railway at a cheap rate. The earthworks are unusually light,
the masonry in bridges and culverts not above the average, and building material
and ballast generally accessible. The great difficulty is, as I have stated previously,
the scarcity of water.

From the approximate list of gradients which follows, it will be seen that the
traffic can be worked at a low rate:

**List of Gradients.**

<table>
<thead>
<tr>
<th>Miles</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 40</td>
<td>1 ¼</td>
</tr>
<tr>
<td>1 &quot; 41 to 1 in 50</td>
<td>3 ½</td>
</tr>
<tr>
<td>1 &quot; 51 &quot; 1 &quot; 60</td>
<td>3</td>
</tr>
<tr>
<td>1 &quot; 61 &quot; 1 &quot; 70</td>
<td>3 ¾</td>
</tr>
<tr>
<td>1 &quot; 71 &quot; 1 &quot; 80</td>
<td>1</td>
</tr>
<tr>
<td>1 &quot; 81 &quot; 1 &quot; 90</td>
<td>7 ½</td>
</tr>
<tr>
<td>1 &quot; 91 &quot; 1 &quot; 100</td>
<td>3 ½</td>
</tr>
<tr>
<td>Above 1 in 100 and level</td>
<td>200 ½</td>
</tr>
</tbody>
</table>

The **Bridges** that will be required are:

<table>
<thead>
<tr>
<th>Feat.</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>50</td>
<td>4</td>
</tr>
<tr>
<td>120</td>
<td>2</td>
</tr>
<tr>
<td>150.</td>
<td>3</td>
</tr>
<tr>
<td>160.</td>
<td>1</td>
</tr>
</tbody>
</table>

I estimate the cost of this line as follows:

<table>
<thead>
<tr>
<th>Route</th>
<th>Miles</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaufort West to Junction at Reim Hoogte,</td>
<td>25 ½</td>
<td></td>
<td></td>
<td>149,553 0 0</td>
</tr>
<tr>
<td>including sidings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reim Hoogte (25 ½ miles) to 219 miles</td>
<td>193 ½</td>
<td></td>
<td></td>
<td>1,107,962 10 0</td>
</tr>
<tr>
<td>Junction of line from Richmond</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From 219 miles to 224 miles, including</td>
<td>5</td>
<td></td>
<td></td>
<td>34,800 0 0</td>
</tr>
<tr>
<td>Station at Hope Town</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1,292,315 10 0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The details of the Estimate are annexed.

**Route No. 2. – Beaufort West to Richmond.**

From 25 ½ miles from Beaufort West, where this line leaves the direct line to
Hope Town, to 26 ½ miles, the work is moderately heavy, and a / gradient of
about 1 in 50 will be required, and an 80-feet bridge will be necessary.
At 32 miles the line passes near the accommodation house at Salt River Drift, and at 33 ¼ miles, Mr. Devenish’s Farm, Klip Kraal.

At 35 ¼ miles the Salt River has to be crossed by a bridge of 150 feet water-way. From here to 45 ¾ miles the work is light, and in soft ground, and the gradients easy.

From 45 ¾ miles to 48 ½ miles, Waaifontein, the work is rather of a heavy description in rock and shale, except the last ½ mile which is heavy work, in rock, with a gradient of about 1 in 50.

At 49 ½ miles a 40-feet bridge will be required.

To 54 ¾ miles the work is moderate, chiefly in shale; but from this point to 57 ½ miles, the work is somewhat heavy, and there is much rock.

From here to 63 ¾ miles the ground is soft and the work moderate.

Tigerfontein Farm is passed about 59 ½ miles.

From 63 ¾ to 65 ¼ miles the work is heavy, chiefly in rock.

At 66 ½ miles, the line passes to the east of Mynhaard Klassens Fontein, and at 74 ½ miles reaches Scietkuil, which is one of the points I propose as suitable as a junction with the Midland System. There is a fair supply of water here, and the farm is on the main road from Victoria West to Murraysburg, and about 30 miles from the former place.

One 60-feet and two 30-feet bridges will be required between Mynhaard Klassens Kraal and Scietkuil, but the work is moderate and the ground chiefly soft.

From Scietkuil, the line crosses an extensive plain, to Bultfontein at 87 miles, and Rondafelsfontein at 92 miles.

With the exception of ¼ mile of tolerably heavy work in shale, this length requires little more than forming. Three 30-feet bridges are however necessary.

At 96 ½ miles the line passes near Mr. Botha’s Farm, Vogelstruisfontein, at 99 ½ miles Gegundenfontein, and at 103 miles Rooi Vald Farm, where a 70-feet bridge is required.

At 105 miles a bridge with 100 feet waterway will be necessary, and at 105 ¾ miles a 30-feet bridge. The work to this point is of the lightest description.

From here to Richmond at 109 ½ miles, the work is heavier, and some rock is met with.

One 30-feet bridge will be required at the entrance to the town.

The site of the station at Richmond cannot be fixed until the question of extension northwards is decided, and a detailed survey made. I am of opinion that if the line is extended from here in the direction of Hanover, the station should be placed to the north-east of the village. Although this will entail a considerable amount of rock-cutting, two bridges over the Ongers River will be saved.
The earthwork on this line is somewhat heavier than on the route to Hope Town, but ballast, stone, and lime, are plentiful, and there is a better supply of water than on route No. 1.

This estimate provides for stations at Salt River, 32 miles, Scietkuils, 74 ½ miles, and at Richmond, besides an allowance of £2,500 for the junction at Beaufort West.

**Approximate List of Gradients.**

<table>
<thead>
<tr>
<th>Miles</th>
<th>1 in 40</th>
<th>1 in 41 to 1 in 50</th>
<th>1 in 51 to 1 in 60</th>
<th>1 in 61 to 1 in 70</th>
<th>1 in 71 to 1 in 80</th>
<th>1 in 81 to 1 in 90</th>
<th>Above 1 in 100 and level</th>
</tr>
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<td>1 ¼</td>
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<td>2</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 ½</td>
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<tr>
<td>4</td>
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<td></td>
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<td>3</td>
<td></td>
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<tr>
<td>2</td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
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<td></td>
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<tr>
<td>87</td>
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<td></td>
</tr>
</tbody>
</table>

I estimate the cost at £686,892. /

**Route No. 3. – Graaff-Reinet to Richmond.**

This is the only route which presents any engineering difficulties, and on this account, and because I understood that the inhabitants of Graaff-Reinet attached great importance to having the line extended through the town, I made a most thorough examination of the country, and after I had selected the line which on the whole I considered best, Messrs. Shaw and Sykes were employed for some weeks in making a trial survey of the more difficult parts of the country; but I am sorry to state that the result of the survey was to prove that the difficulties were greater than I had anticipated.

[...] I inspected three routes northwards from Graaff-Reinet.

First, – the one recommended by Mr. Bain, via Pienaars River Valley, Osfontein Nek, Scorpions Kral, and Hartebeeste Nek.

For about 20 miles, this route is identical with the one via Zuurpoort, which I have adopted, and although of somewhat greater length than the Zuurpoort route, should be surveyed in detail, before either route is decided upon.

To the best of my judgment, however, the line via Zuurpoort can be made for a smaller sum than the other, and this route has the advantage of providing a Station within a convenient distance of Murraysburg.

The third route which I examined, is towards Herbets Nek, a gap in the mountains, some distance beyond Mr. Rubidge’s Farm, Wellwood.
The country rises in a series of terraces from the valley of the Sundays River, and is rough and broken in the extreme.

I consider this route utterly unsuitable for a line of railway.

Route via Zuurpoort.

After leaving the present Terminus of the Midland Railway, the line will cross the Sundays River, near the end of Bourke-street, and will follow the general direction of this street through the Town. The ground is favourable, and very little house-property will be interfered with.

About 1¼ miles from the Junction, the Sundays River has again to be crossed. A bridge of 150 feet waterway will be required in each case.

After crossing the river, the line will be taken through Rynevelds Pass, where two sharp curves will be required, and there will be about ¼ mile of heavy scarping in rock.

After this, the work is moderate to 8¼ miles, where the farm Lower Buffels Hoek is reached.

A 30-feet bridge will be required for the crossing of the Pienaars River.

From 8¼ miles to 13¼ miles the line follows the slope of the hills on the east side of the valley, and reaches a neck, opposite Riet Vley Farm, with a continuous gradient for the 5 miles, of about 1 in 50. The work will be moderately heavy, scarping partly in rock, and three 20 feet bridges are required on the length.

From here to 18¾ miles, the line still follows the slope of the hills on the east side of the Pienaars River valley, but the work on a great part of this length will be of the heaviest description, on account of the numerous cross kloofs which have to be passed, and at least three heavy viaducts will be required, and several 5-chain curves will be necessary.

The gradient to this point is about 1 in 66.

At 18¾ miles the line emerges from the valley at the head of Wolve Kloof, and from here to Sneuwerberg Nek, at 31 miles, thence to Zuurplaats Dam (36¾ miles), the work is only moderately heavy.

From this point, the steep ascent (of two miles by road) to Zuurpoort Hoogte begins, and the line has to be lengthened two miles, by contouring the hillsides to the left of the road, in order to get a gradient of 1 in 40. Both earthwork and masonry on this length will be extremely heavy, and several curves of small radius cannot be avoided.

Zuurpoort Hoogte 40¾ miles, is the first summit of the Sneuwerberg mountains which the line crosses, and is about 2,500 feet above the town of Graaff-Reinet.

A point is passed at 70 miles on this route, which is about 400 feet higher than Zuurpoot, yet the great difficulty of the work is over at the last-mentioned
place, and the rest of the line to Richmond, although above the average, is not unusually heavy.

For the next 4 miles, the ground is good and the work light.

From 44 ¾ to 45 ¼ miles there is some scarping, partly in rock, on the east side of Poortjie Kloof.

The roads to Murraysburg and Richmond separate here, and this would I think, be the best site for a station.

The distance to Murraysburg is under 20 miles.

At 53 miles, the line will pass at the back of Witte Klip Farm, and the work to this point will be moderately heavy.

To 63 miles, the work is little more than forming in soft ground, and thence to Rhenosterfontein Farm at 65 miles, only a little heavier. A 40 feet bridge will be required here.

For 3 ½ miles from Rhenosterfontein, only forming is required, but from 68 ½ miles to 72 miles, the work is mostly heavy, and partly in rock.

Burghers Kraal is passed at 74 miles, and Scietkuil Kraal at 76 miles.

The whole of the work from 72 miles to Richmond (89 miles), is as light as possible, and with the exception of one mile (79 to 80) the gradients are easy.

A bridge of 120 feet waterway will be required for the Ongers River at Richmond.

With reference to the cost of this line, as it is impossible to estimate with certainty, for heavy work of this description, without detailed surveys, which I was not authorised to make, I can only say that to the best of my judgment, the line can be made for the sum named in the approximate estimate appended to the report, viz., £927,531.

The estimate provides a sum of £2,000 for extra works at the Junction Station at Graaff-Reinet, and £5,520 for the Station at Murraysburg. The station at Richmond is provided for in the estimate of No. 2 Route.

The Bridges required are as follows:

<table>
<thead>
<tr>
<th>Feet</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 (Viaducts)</td>
<td>7</td>
</tr>
<tr>
<td>150 (Bridges)</td>
<td>2</td>
</tr>
<tr>
<td>120</td>
<td>1</td>
</tr>
<tr>
<td>40</td>
<td>1</td>
</tr>
<tr>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
</tr>
</tbody>
</table>
Approximate Gradients.

<table>
<thead>
<tr>
<th>Gradients</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 40</td>
<td>10½</td>
</tr>
<tr>
<td>1 &quot; 41 to 1 in 50</td>
<td>2</td>
</tr>
<tr>
<td>1 &quot; 51 &quot; 1 &quot; 60</td>
<td>6</td>
</tr>
<tr>
<td>1 &quot; 61 &quot; 1 &quot; 70</td>
<td>10¾</td>
</tr>
<tr>
<td>1 &quot; 71 &quot; 1 &quot; 80</td>
<td>3½</td>
</tr>
<tr>
<td>1 &quot; 81 &quot; 1 &quot; 90</td>
<td>15½</td>
</tr>
<tr>
<td>1 &quot; 91 &quot; 1 &quot; 100</td>
<td>2</td>
</tr>
<tr>
<td>Above 1 in 100 and Level</td>
<td>38¾</td>
</tr>
<tr>
<td></td>
<td>89</td>
</tr>
</tbody>
</table>

Route No. 4. — Hanover to Phillips Town.

With the exception of about 3 miles near Phillips Town, the earthworks of this line are exceptionally light, and on account of the line following generally the direction of the watershed between the Ongers and Zeekoe Rivers, only 5 bridges, 1 of 50 feet, and 4 of 30 feet span are required.

Building stone is not so plentiful as on the other routes, and I have increased item for culverts on this account.

After leaving the station at Richmond, the line runs for 11 miles over slightly undulating ground, with good gradients and light work.

At 12½ miles the line passes near Kaifontein Farm, the last 1½ miles being somewhat heavier work, and about ½ mile of steep gradient being necessary.

At 114 miles, Skuirfontein, there is a short length of moderately heavy work in rock, but from here to Bontebok Nek, at 25 miles, the work is little more than forming. A ¼ mile of rough work in rock, but only moderately heavy, is required here.

At 33½ miles the line passes near Uilefontein Farm, and reaches Hanover, 38 miles, with the very lightest work except that some extra provision for drainage is required here and there.

I propose to place the station for Hanover at the south-east of the village, near the Cemetery, where there is a most suitable site in all respects. The water-supply is ample, and of good quality.

With the exception of a short length of work in rock, about 44 miles from Richmond, the country beyond Hanover is perfectly flat, and the work is of the lightest description, to the Waterfall Farm, at 76 miles.

Two farms called Stirkfontein are passed at 54½ and 59½ miles respectively.

Beyond the Waterfall Farm, one mile of rough ground is encountered, where the work will be moderately heavy, and the ground falls rapidly to the valley of the Hondeblas River, where Phillips Town stands.

I estimate the distance from Richmond to Phillips Town at 80½ miles.
The line will pass to the west of the village, and I propose to place a station here, about ½ mile distant from the Market Square. The water-supply is not good, but can probably be improved by sinking.

At 89½ miles the line passes to the left of the hill, where the homestead of Tigerfontein stands, and then follows the valley of the valley of the stream for some miles.

From Tigerfontein stands, and then follows the valley of the stream for some miles.

From Tigerfontein to the junction with route No. 1, at 146 miles, the work is as light as possible, and in soft ground.

The following Farms are passed: Bok Kraal, 94 ½ miles; Boschberg, 102½ miles; Grass Pan, 106 ½ miles; Plessis Dam, 111 miles; Dornkuil or Aasvogel Kop, 119 miles; Biesilaagte, 138 ½ miles.

I estimate the cost at £870,401.

[...] The gradients from Richmond to junction with route No. 1, are approximately as follows:

<table>
<thead>
<tr>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 40 . . . . . . . .</td>
</tr>
<tr>
<td>1 &quot; 41 to 1 in 50 . . . . . . . . . . . . . .</td>
</tr>
<tr>
<td>1 &quot; 51 &quot; 1 &quot; 60 . . . . . . . . . . . . . .</td>
</tr>
<tr>
<td>1 &quot; 61 &quot; 1 &quot; 70 . . . . . . . . . . . . . .</td>
</tr>
<tr>
<td>1 &quot; 71 &quot; 1 &quot; 80 . . . . . . . . . . . . . .</td>
</tr>
<tr>
<td>1 &quot; 81 &quot; 1 &quot; 90 . . . . . . . . . . . . . .</td>
</tr>
<tr>
<td>1 &quot; 91 &quot; 1 &quot; 100 . . . . . . . . . . . . . .</td>
</tr>
<tr>
<td>Above 1 in 100 and level . . . . . . . . . . . . . .</td>
</tr>
</tbody>
</table>

The detailed estimate is annexed.

**Route No. 5. – Hanover to Colesberg and Orange River.**

From the proposed station at Hanover to the Zeekoe River, 8 miles, the earthwork is light, but some extra work is light, but some extra provision for drainage is required.

A 40-feet bridge must be provided about 5¾ miles, and one with 150 feet waterway will be necessary to cross the Zeekoe River.

All 11 miles the line passes Andriesfontein, where there is a good spring.

The work to this point is moderate, but after passing the farm, there is a ¼ mile of pretty heavy work in rock.

As far as Beestekraal Sluit, near Mr. Bartlett’s Farm, at 19½ miles, the work is still medium, and chiefly in shale.

A 40-feet bridge is required for the Sluit, and a 30-feet bridge at 21½ miles.
The line must pass some distance to the north of Mooi Fontein, about 26 miles, and the work is not heavy until near Elandsfontein, where about 1 mile of moderately heavy work cannot be avoided.

From here, to Kuilsfontein, at 35½ miles, and to the site which I propose for the station, to the north-west of Colesberg, 46 miles, the country is easy, and the work is light.

The line will pass to the north of the Town, and, for the first 3 miles, the work is somewhat rough, and the gradients broken, but after this to about 51 miles, where the line enters Rietfontein Poort, the work is light.

There is about 1 mile of medium work, and some pitching to the slopes of the bank will be required. In the poort through which the road and river runs, a skew bridge with 70 feet waterway is necessary for crossing the river.

From Rietfontein to the Orange River, at the site of the road bridge in course of construction (63 miles), the work is not heavy, though somewhat above the average.

If the road bridge is not available for the Railway, an equally good crossing exists about ½ mile down stream, immediately above the Pont, and the quantity of the earthwork would not be increased.

Speaking generally of this route from Richmond, the earthworks are somewhat above the average, but building materials and ballast are plentiful.

The annexed estimate provides for a station at Colesberg, and 1 at the Orange River.

The Bridges required are as follows:

<table>
<thead>
<tr>
<th>Span in Feet</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>1</td>
</tr>
<tr>
<td>70 (Skew)</td>
<td>1</td>
</tr>
<tr>
<td>50</td>
<td>1</td>
</tr>
<tr>
<td>40</td>
<td>2</td>
</tr>
<tr>
<td>30</td>
<td>3/2</td>
</tr>
</tbody>
</table>

The list of approximate gradients is as follow:

<table>
<thead>
<tr>
<th>Miles</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 40</td>
<td></td>
</tr>
<tr>
<td>1 &quot; 41 to 1 in 50</td>
<td>1 ⅓</td>
</tr>
<tr>
<td>1 &quot; 42 &quot; 1 &quot; 60</td>
<td>4 ⅛</td>
</tr>
<tr>
<td>1 &quot; 61 &quot; 1 &quot; 70</td>
<td>6 ½</td>
</tr>
<tr>
<td>1 &quot; 71 &quot; 1 &quot; 80</td>
<td>3</td>
</tr>
<tr>
<td>1 &quot; 81 &quot; 1 &quot; 90</td>
<td>4</td>
</tr>
<tr>
<td>1 &quot; 91 &quot; 1 &quot; 100</td>
<td>1</td>
</tr>
<tr>
<td>Above 1 in 100 and level</td>
<td>42</td>
</tr>
</tbody>
</table>

I estimate the cost of the line at £400,067.
Route No. 6. – From a point on No. 2 near Nels Poort, to Aberdeen Road Station on the Midland Line.

The Line leaves Route No. 2, about 32 miles from Beaufort, near the accommodation house at Salt River Drift, and crosses the river by a bridge of 150 feet waterway.

After following the slopes of the hills which extend from here to Stellenbosch Valley to a Nek about 4 ½ miles from the Junction, the line takes the general direction of the Murraysbug Road, to a point 2 miles to the west of Kruidfontein, where route No. 8 diverges to Secretaarskraal. With the exception of 1 mile of rough ground at the Nek above-mentioned, the earthwork on this length will be light.

At about 19 ½ miles the Buffalo River is crossed, near Rosebaaken Farm, by a bridge of 200 feet waterway, and thence the line passes over the extensive plains to the north of Stellenbosch Valley towards Aberdeen at 70 miles. The work is nothing more than forming, with some extra provision for drainage.

The following Bridges are, however, required:–

1 80-feet at Oudeplaats River.
1 50-feet " Zarels River.
1 70-feet " Kewna River.
1 50-feet " Branch of Camdeboo River.

In the neighbourhood of Aberdeen, the work is somewhat heavier for about 2 miles.

The site of the station will be near the crossing of the stream to the south of the village, where there is a fair supply of water.

From Aberdeen to the junction with the Midland Railway at Aberdeen Road Station, the line will follow the general direction of the new road in course of construction, and the work continues light the whole of the way.

With the exception of ½ mile of about 1 in 60, there need be no gradient steeper than 1 in 100 on this line, and the traffic can be worked most economically.

The cost of construction will also be below the average, not only on account of the lightness of the earthworks, but also from the advantage of railway communication with both ends of the work.

Ballast, however, is not so plentiful as no the other routes, and I have increased the price for that item.

I have provided in the estimate for a station at Salt River and Aberdeen, and for an intermediate one.

I estimate the cost at £522,947.
Route No. 7. – From a point near Stellenbosch Vallei on No. 6 to Scietkuil on No. 2.

This line leaves route No. 6 about 28 miles, and for the first 6 miles to Doofontein the work is light forming only.

From here to the crossing of the Murraysburg road at 13 miles, the country rises in a series of plateaus, with short steep ascents between them, and the work is consequently somewhat heavier, and partly in rock.

After crossing the road the line has to follow the base of the hills to the left, which die out opposite Toverfontein. This causes a considerable divergence from the direct route, but the work is not heavy, and the ground is chiefly soft.

At 19 miles the Buffalo River is crossed at Secretaars Kraal, by a bridge of 180 feet waterway; the section of the river bed at this point is most favourable for crossing, and the foundations for the bridge are good.

From here to Scietkuil, 38 miles, the line passes over much the same ground as that described in route No. 2, with moderate work in soft material.

I have provided in the estimate for a station at Secretaars Kraal, one at Scietkuil is provided for in the estimate for No. 2 route.

The only bridges required are one of 180 feet, and two of 30 feet, but the number of culverts is above the average.

The gradients are approximately as follows:

<table>
<thead>
<tr>
<th>Miles</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 40</td>
<td>¼</td>
</tr>
<tr>
<td>1 &quot; 41 to 1 in 50</td>
<td>¾</td>
</tr>
<tr>
<td>1 &quot; 51 &quot; 1 &quot;</td>
<td>60 1</td>
</tr>
<tr>
<td>1 &quot; 61 &quot; 1 &quot;</td>
<td>70 1</td>
</tr>
<tr>
<td>1 &quot; 71 &quot; 1 &quot;</td>
<td>80 0</td>
</tr>
<tr>
<td>1 &quot; 81 &quot; 1 &quot;</td>
<td>90 2 ½</td>
</tr>
<tr>
<td>1 &quot; 91 &quot; 1 &quot;</td>
<td>100 4</td>
</tr>
<tr>
<td>Above 1 in 100 and level</td>
<td>28</td>
</tr>
</tbody>
</table>

I estimate the cost of this line at £229,347.

Route No. 8 – From a point near Kruidfontein on No. 6 to Secjetaars Kraal on No. 7.

This is an alternative line for forming a junction between the two systems at Secretaars Kraal instead of at Nels Poort or Scietkuil. It leaves route No. 6 at 15 miles from Nels Poort, and after 2 miles of light work over the flat, crosses the stream below Kruidfontein Farm by a 50-feet bridge.

The line then turns to the left, to avoid a range of hills, and to 6 ¾ miles where a 20-feet bridge is required, the work is moderate.
From here to the Buffalo River, which is crossed at 7 ¾ miles, the work is heavier, and a gradient of 1 in 66 is required for a part of the distance.

A bridge of 200 feet waterway is required for the river.

At 13 ¼ miles the line passes between the homestead and the dam at Kraaifontein, and crosses the Murraysburg Road.

The work is not heavy, but two short lengths of 1 in 40 gradients are necessary.

From here to Secretaars Kraal, 19 miles, the line follows a valley to the north of the road, and the work is light and the gradients easy.

The bridge and station at Secretaars Kraal are provided for in the estimate for route No. 7. /

The Bridges required on this route are as follows:–

<table>
<thead>
<tr>
<th>No</th>
<th>Span in Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>200</td>
</tr>
<tr>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
</tr>
</tbody>
</table>

Approximate Gradients.

<table>
<thead>
<tr>
<th>1 in 40</th>
<th>1 in 41 to 1 in 70</th>
<th>1 in 71 to 1 in 90</th>
<th>1 in 91 to 1 in 100</th>
<th>Above 1 in 100 and level</th>
</tr>
</thead>
<tbody>
<tr>
<td>¾</td>
<td>¾</td>
<td>1½</td>
<td>2</td>
<td>14</td>
</tr>
</tbody>
</table>

I estimate the cost of this line £ 133,600.

With regard to the estimates appended to the Report, I should state that the total estimated length, including sidings, is taken in all cases. This will give an average increase of 5 per cent. in the prices, if the net distance only is taken.

I consider the prices ample to carry on the work under present circumstances, when a large quantity of plant and skilled labour of various kinds would be available from the railways now nearly completed.

But if there be a long delay in starting the Extension Works, and a new staff has to be organized, a considerable addition will have to be made.

[...]  
J.F. STATTER. /
ENVELOPE TO MR. STATTER’S LETTER, DATED 17TH MAY, 1879.

DETAILS OF ESTIMATES.

Route No. 1. – Beaufort West to Hope Town Direct.

<table>
<thead>
<tr>
<th>Estimated distance</th>
<th>224</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sidings</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>235</td>
</tr>
</tbody>
</table>

**Bridges:**

<table>
<thead>
<tr>
<th>Span in Feet</th>
<th>No.</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>£</td>
</tr>
<tr>
<td></td>
<td></td>
<td>£ s. d.</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>500</td>
</tr>
<tr>
<td>30</td>
<td>10</td>
<td>750</td>
</tr>
<tr>
<td>50</td>
<td>4</td>
<td>1,500</td>
</tr>
<tr>
<td>120</td>
<td>2</td>
<td>3,600</td>
</tr>
<tr>
<td>150</td>
<td>3</td>
<td>4,500</td>
</tr>
<tr>
<td>160</td>
<td>1</td>
<td>4,800</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Span in Feet</th>
<th>No.</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>£</td>
</tr>
<tr>
<td></td>
<td></td>
<td>£ s. d.</td>
</tr>
<tr>
<td>40,000</td>
<td></td>
<td>0 0</td>
</tr>
</tbody>
</table>

**Rate per mile.**

<table>
<thead>
<tr>
<th>Cost Description</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£</td>
</tr>
<tr>
<td></td>
<td>£ s. d.</td>
</tr>
<tr>
<td>Ballasting, including Maintenance during Construction</td>
<td>500</td>
</tr>
<tr>
<td>Cottages (Platelayers)</td>
<td>100</td>
</tr>
<tr>
<td>Culverts</td>
<td>300</td>
</tr>
</tbody>
</table>

**Earthwork:**

<table>
<thead>
<tr>
<th>No. of Miles</th>
<th>Rate per Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£</td>
</tr>
<tr>
<td></td>
<td>£ s. d.</td>
</tr>
<tr>
<td>110</td>
<td>300</td>
</tr>
<tr>
<td>65</td>
<td>450</td>
</tr>
<tr>
<td>32</td>
<td>600</td>
</tr>
<tr>
<td>11</td>
<td>900</td>
</tr>
<tr>
<td>2¼</td>
<td>1,350</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. of Miles</th>
<th>Rate per Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£</td>
</tr>
<tr>
<td></td>
<td>£ s. d.</td>
</tr>
<tr>
<td>40,000</td>
<td>0 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rate per mile.</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£ s. d.</td>
</tr>
<tr>
<td>Ballasting, including Maintenance during Construction</td>
<td>500</td>
</tr>
<tr>
<td>Cottages (Platelayers)</td>
<td>100</td>
</tr>
<tr>
<td>Culverts</td>
<td>300</td>
</tr>
</tbody>
</table>
### Reports on Inspections

<table>
<thead>
<tr>
<th>No. of Miles</th>
<th>Rate per Mile</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8¾</td>
<td>2,000</td>
<td>17,500</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>6,750</td>
<td>40,500</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rate per Mile</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>152,387</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Engineering, Surveying And Office Expenses**

- £ 350 82,250 0 0

**Housing Workmen**

- £ 100 23,500 0 0

**Level Crossings, Gradient and Mile Posts, Signals, &c**

- £ 50 11,750 0 0

**Loss on Live-stock and Plant**

- £ 100 23,500 0 0

**Permanent Way**

- £ 1,325 311,375 0 0

**Carried forward**

- £ 856,262 10 0

<table>
<thead>
<tr>
<th>Rate per Mile</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brought forward</td>
<td>£ 856,262</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Road Laying</td>
<td>£ 100</td>
<td>23,500</td>
<td>0</td>
</tr>
<tr>
<td>Rolling-stock</td>
<td>£ 500</td>
<td>117,500</td>
<td>0</td>
</tr>
<tr>
<td>Stations</td>
<td>£ 125</td>
<td>29,375</td>
<td>0</td>
</tr>
<tr>
<td>Stores (distribution of)</td>
<td>£ 75</td>
<td>17,625</td>
<td>0</td>
</tr>
<tr>
<td>Telegraph</td>
<td>£ 100</td>
<td>23,500</td>
<td>0</td>
</tr>
<tr>
<td>Temporary Works</td>
<td>£ 100</td>
<td>23,500</td>
<td>0</td>
</tr>
<tr>
<td>Transport of Materials</td>
<td>£ 250</td>
<td>58,750</td>
<td>0</td>
</tr>
<tr>
<td>Water Supply</td>
<td>£ 100</td>
<td>23,500</td>
<td>0</td>
</tr>
<tr>
<td>Add for Steel Rails (12 miles)</td>
<td>£ 110</td>
<td>1,320</td>
<td>0</td>
</tr>
</tbody>
</table>

- £ 1,174,832 | 10 | 0 |

**10 per cent. for Contingencies**

- £ 117,483 | 0 | 0 |

**Total**

- £ 1,292,315 | 10 | 0 |

---

**Route No. 2. – Beaufort West to Richmond.**

<table>
<thead>
<tr>
<th>Miles.</th>
</tr>
</thead>
<tbody>
<tr>
<td>25½</td>
</tr>
<tr>
<td>84</td>
</tr>
<tr>
<td>7½</td>
</tr>
<tr>
<td>117</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>149,553</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Bridges:**

<table>
<thead>
<tr>
<th>Span in feet</th>
<th>No.</th>
<th>Rate.</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>7</td>
<td>750</td>
<td>5,250</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>40</td>
<td>1</td>
<td>1,100</td>
<td>1,100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>60</td>
<td>1</td>
<td>2,000</td>
<td>2,000</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
70 1 2,200 2,200 0 0
80 1 2,500 2,500 0 0
100 1 3,000 3,000 0 0
150 1 4,500 4,500 0 0 20,550 0 0

**Earthwork:**

<table>
<thead>
<tr>
<th>No. of Miles</th>
<th>Rate per Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£</td>
</tr>
<tr>
<td>52</td>
<td>400</td>
</tr>
<tr>
<td>22</td>
<td>600</td>
</tr>
<tr>
<td>3</td>
<td>900</td>
</tr>
<tr>
<td>2</td>
<td>1,500</td>
</tr>
<tr>
<td>6½</td>
<td>2,700</td>
</tr>
<tr>
<td>1½</td>
<td>3,750</td>
</tr>
<tr>
<td>3</td>
<td>6,750</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Carried forward</td>
<td></td>
</tr>
</tbody>
</table>

/ Rate per Mile

<table>
<thead>
<tr>
<th>Brought forward</th>
</tr>
</thead>
<tbody>
<tr>
<td>£</td>
</tr>
<tr>
<td>Ballasting, including Maintenance during Construction</td>
</tr>
<tr>
<td>Cottages (Platelayers')</td>
</tr>
<tr>
<td>Culverts</td>
</tr>
<tr>
<td>Engineering, Surveying and Office Expenses</td>
</tr>
<tr>
<td>Level Crossings, Gradient and Mile Posts, Signals, &amp;c.</td>
</tr>
<tr>
<td>Housing Workmen</td>
</tr>
<tr>
<td>Loss on Live-stock and Plant</td>
</tr>
<tr>
<td>Permanent Way</td>
</tr>
<tr>
<td>Road Laying</td>
</tr>
<tr>
<td>Rolling-stock</td>
</tr>
<tr>
<td>Stations</td>
</tr>
<tr>
<td>Stores (distribution of)</td>
</tr>
<tr>
<td>Telegraph</td>
</tr>
<tr>
<td>Temporary Works</td>
</tr>
<tr>
<td>Transport of Materials</td>
</tr>
<tr>
<td>Water Supply</td>
</tr>
<tr>
<td>Add for Steel Rails</td>
</tr>
</tbody>
</table>

10 per cent. for Contingencies | 62,444 0 0 |

Total | 686,892 0 0 |
**Route No 3. – Graaff-Reinet to Richmond.**

<table>
<thead>
<tr>
<th>Miles.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated distance</td>
</tr>
<tr>
<td>Sidings</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

**Bridges:**

<table>
<thead>
<tr>
<th>Span in Feet</th>
<th>No.</th>
<th>Rate.</th>
<th>£</th>
<th>£ s. d.</th>
<th>£ s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 (viaduct)</td>
<td>7</td>
<td>10,000</td>
<td></td>
<td>70,000</td>
<td>0 0</td>
</tr>
<tr>
<td>150</td>
<td>2</td>
<td>7,000</td>
<td></td>
<td>14,000</td>
<td>0 0</td>
</tr>
<tr>
<td>120</td>
<td>1</td>
<td>3,600</td>
<td></td>
<td>3,600</td>
<td>0 0</td>
</tr>
<tr>
<td>40</td>
<td>1</td>
<td>1,100</td>
<td></td>
<td>1,100</td>
<td>0 0</td>
</tr>
<tr>
<td>30</td>
<td>3</td>
<td>750</td>
<td></td>
<td>2,250</td>
<td>0 0</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
<td>600</td>
<td></td>
<td>1,800</td>
<td>0 0</td>
</tr>
</tbody>
</table>

| Total | 92,750  | 0 0 |

**Earthwork:**

<table>
<thead>
<tr>
<th>No. of Miles</th>
<th>Rate per Mile.</th>
<th>£</th>
<th>£ s. d.</th>
<th>£ s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>300</td>
<td>1,500</td>
<td>0 0</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>400</td>
<td>10,000</td>
<td>0 0</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>600</td>
<td>10,200</td>
<td>0 0</td>
<td></td>
</tr>
<tr>
<td>1½</td>
<td>900</td>
<td>1,350</td>
<td>0 0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1,350</td>
<td>1,350</td>
<td>0 0</td>
<td></td>
</tr>
</tbody>
</table>

| Carried forward | 24,400 | 0 0 | 92,750 | 0 0 |

| Brought forward | 24,400 | 0 0 | 92,750 | 0 0 |

**Rate per Mile.**

| Ballasting, including Maintenance during Construction | 600 | 56,400 | 0 0 |
| Cottages (Platelayers) | 100 | 9,400  | 0 0 |
| Culverts | 400 | 37,600 | 0 0 |
| Engineering, Surveying and Office Expenses | 450 | 42,300 | 0 0 |
| Housing Workmen | 100 | 9,400  | 0 0 |
Level Crossings, Gradients and Mile Posts, Signals &c. 50 4,700 0 0
Loss on Live-stock and Plant 130 12,220 0 0
Permanent Way 1,260 118,440 0 0
Road Laying 100 9,400 0 0
Rolling-stock 500 47,000 0 0
Stations 80 7,520 0 0
Stores (distribution of) 75 7,050 0 0
Telegraph 100 9,400 0 0
Temporary Works, including Roads 120 11,280 0 0
Transport of Material 300 28,200 0 0
Water Supply 100 9,400 0 0
Add for Steel Rails (35 miles) 110 3,850 0 0
10 per cent. for Contingencies . 84,321 0 0
Total 927,531 0 0

Route No. 4. – Richmond to Hope Town.

Mile.
Estimated distance to junction 146
Sidings 8
Junction to River, as before 5
Total 159

Bridges:

<table>
<thead>
<tr>
<th>Span in Feet</th>
<th>No.</th>
<th>Rate.</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>1</td>
<td>2,000</td>
<td>2,000 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>4</td>
<td>750</td>
<td>3,000 0 0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5,000 0 0
Carried forward 5,000 0 0
Brought forward 5,000 0 0

Earthwork:

<table>
<thead>
<tr>
<th>No. of Miles</th>
<th>Rate per Mile.</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>300</td>
<td>2,400 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>350</td>
<td>24,150 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>500</td>
<td>19,500 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>600</td>
<td>2,400 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>800</td>
<td>16,000 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>900</td>
<td>6,300 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1¼</td>
<td>1,500</td>
<td>2,625 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3½</td>
<td>2,700</td>
<td>9,450 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1¼</td>
<td>6,750</td>
<td>11,812 10 0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

94,637 10 0
Reports on Inspections

Rate per Mile.

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
<th>£s. d.</th>
<th>£</th>
<th>£s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ballasting, including Maintenance during construction</td>
<td>500</td>
<td>77,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cottages (Platelayers')</td>
<td>100</td>
<td>15,400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Culverts</td>
<td>500</td>
<td>77,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Engineering, Surveying and Office Expenses</td>
<td>300</td>
<td>46,200</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Housing Workmen</td>
<td>50</td>
<td>7,700</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Level Crossings, Gradient and Mile Posts, Signals, &amp;c.</td>
<td>50</td>
<td>7,700</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Loss on Live-stock and Plant</td>
<td>100</td>
<td>15,400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Permanent Way</td>
<td>1,400</td>
<td>215,600</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Road Laying</td>
<td>100</td>
<td>15,400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Rolling-stock</td>
<td>500</td>
<td>77,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Stations</td>
<td>100</td>
<td>15,400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Stores (distribution of)</td>
<td>75</td>
<td>11,550</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Telegraph</td>
<td>100</td>
<td>15,400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Temporary Works</td>
<td>100</td>
<td>15,400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Transport of Materials</td>
<td>200</td>
<td>30,800</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Water Supply</td>
<td>100</td>
<td>15,400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Add for Steel Rails (15 miles)</td>
<td>110</td>
<td>1,650</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>759,637</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>10 per cent. for Contingencies</td>
<td></td>
<td>75,963</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>835,601</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>From junction to orange River, including Hope Town Station, as before</td>
<td></td>
<td>34,800</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>870,401</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

Route No. 5. – Hanover to Colesberg and Orange River.

Miles.

Estimated distance                                                               | 63 |
Sidings                                                                        | 3  |
Total                                                                          | 66 / |

Bridges:

<table>
<thead>
<tr>
<th>Span in Feet</th>
<th>No.</th>
<th>Rate</th>
<th>£</th>
<th>£s. d.</th>
<th>£</th>
<th>£s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>1</td>
<td>6,000</td>
<td></td>
<td></td>
<td>6,000</td>
<td>0 0</td>
</tr>
<tr>
<td>70 (skew)</td>
<td>1</td>
<td>3,000</td>
<td></td>
<td></td>
<td>3,000</td>
<td>0 0</td>
</tr>
<tr>
<td>50</td>
<td>1</td>
<td>1,500</td>
<td></td>
<td></td>
<td>1,500</td>
<td>0 0</td>
</tr>
<tr>
<td>40</td>
<td>2</td>
<td>2,400</td>
<td></td>
<td></td>
<td>2,400</td>
<td>0 0</td>
</tr>
<tr>
<td>30</td>
<td>3</td>
<td>800</td>
<td></td>
<td></td>
<td>2,400</td>
<td>0 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15,300</td>
<td>0 0</td>
</tr>
</tbody>
</table>
### Earthwork:

<table>
<thead>
<tr>
<th>No. of Miles</th>
<th>Rate per Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>£</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>300</td>
</tr>
<tr>
<td>10</td>
<td>400</td>
</tr>
<tr>
<td>24</td>
<td>500</td>
</tr>
<tr>
<td>2 ¾</td>
<td>600</td>
</tr>
<tr>
<td>1 ½</td>
<td>750</td>
</tr>
<tr>
<td>7 ¼</td>
<td>900</td>
</tr>
<tr>
<td>10 ½</td>
<td>1,500</td>
</tr>
<tr>
<td>2 ¾</td>
<td>2,700</td>
</tr>
<tr>
<td>3</td>
<td>3,750</td>
</tr>
<tr>
<td>¼</td>
<td>6,750</td>
</tr>
</tbody>
</table>

Total: 66,137 10 0

<table>
<thead>
<tr>
<th>Rate per Mile</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ballasting, including Maintenance during Construction</td>
<td>500   33,000 0 0</td>
</tr>
<tr>
<td>Cottages (Platelayers')</td>
<td>100 6,600 0 0</td>
</tr>
<tr>
<td>Culverts</td>
<td>400 26,400 0 0</td>
</tr>
<tr>
<td>Engineering, Surveying and Office Expenses</td>
<td>350 23,100 0 0</td>
</tr>
<tr>
<td>Housing Workmen</td>
<td>75 4,950 0 0</td>
</tr>
<tr>
<td>Level Crossings, Gradient and Mile Posts, Signals &amp;c.,</td>
<td>50 3,300 0 0</td>
</tr>
<tr>
<td>Losses on Live-stock and Plant</td>
<td>100 6,600 0 0</td>
</tr>
<tr>
<td>Permanent Way</td>
<td>1,350 89,100 0 0</td>
</tr>
<tr>
<td>Road Laying</td>
<td>100 6,600 0 0</td>
</tr>
<tr>
<td>Rolling-stock</td>
<td>500 33,000 0 0</td>
</tr>
<tr>
<td>Stations</td>
<td>100 6,600 0 0</td>
</tr>
<tr>
<td>Stores (distribution of)</td>
<td>75 4,950 0 0</td>
</tr>
<tr>
<td>Telegraph</td>
<td>100 6,600 0 0</td>
</tr>
<tr>
<td>Temporary Works</td>
<td>100 6,600 0 0</td>
</tr>
<tr>
<td>Transport of Materials</td>
<td>250 16,500 0 0</td>
</tr>
<tr>
<td>Water Supply</td>
<td>100 6,600 0 0</td>
</tr>
<tr>
<td>Add for Steel Rails (16 miles)</td>
<td>110 1,760 0 0</td>
</tr>
</tbody>
</table>

363,697 10 0

10 per cent. for Contingencies | 36,369 15 0 |

Total | 400,007 5 0 /

### Route No. 6. — From a point on No. 2 near Nels Poort to Aberdeen Road Station on the Midland Railway.

<table>
<thead>
<tr>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated distance</td>
</tr>
<tr>
<td>Sidings</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
### Reports on Inspections

#### Bridges:

<table>
<thead>
<tr>
<th>Span in Feet</th>
<th>No.</th>
<th>Rate.</th>
<th>£ s. d.</th>
<th>£ s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>1</td>
<td>9,000</td>
<td>9,000</td>
<td>0</td>
</tr>
<tr>
<td>150</td>
<td>1</td>
<td>6,000</td>
<td>6,000</td>
<td>0</td>
</tr>
<tr>
<td>80</td>
<td>1</td>
<td>2,500</td>
<td>2,500</td>
<td>0</td>
</tr>
<tr>
<td>70</td>
<td>1</td>
<td>2,200</td>
<td>2,200</td>
<td>0</td>
</tr>
<tr>
<td>50</td>
<td>2</td>
<td>1,500</td>
<td>3,000</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22,700</td>
</tr>
</tbody>
</table>

#### Earthwork:

<table>
<thead>
<tr>
<th>No. of Miles</th>
<th>Rate per Mile.</th>
<th>£</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>300 £ 9,000</td>
<td>522,948</td>
<td>522,948</td>
</tr>
<tr>
<td>48</td>
<td>400 £ 19,200</td>
<td>522,948</td>
<td>522,948</td>
</tr>
<tr>
<td>11¼</td>
<td>700 £ 7,875</td>
<td>522,948</td>
<td>522,948</td>
</tr>
<tr>
<td>5¼</td>
<td>750 £ 3,937</td>
<td>522,948</td>
<td>522,948</td>
</tr>
<tr>
<td>2½</td>
<td>1,350 £ 3,375</td>
<td>522,948</td>
<td>522,948</td>
</tr>
<tr>
<td>1</td>
<td>6,750 £ 6,750</td>
<td>522,948</td>
<td>522,948</td>
</tr>
<tr>
<td></td>
<td></td>
<td>522,948</td>
<td>522,948</td>
</tr>
</tbody>
</table>

Rate per Mile: 522,948

- Ballasting, including Maintenance during Construction: 600 £ 522,948 0 0
- Cottages (Platelayers') : 100 £ 522,948 0 0
- Culverts: 400 £ 522,948 0 0
- Engineering, Surveying and Office Expenses: 300 £ 522,948 0 0
- Housing Workmen: 75 £ 522,948 0 0
- Level Crossings, Gradient and Mile Posts, Signals, &c.: 50 £ 522,948 0 0
- Losses on Live-stock and Plant: 100 £ 522,948 0 0
- Permanent Way: 1,250 £ 522,948 0 0
- Road Laying: 100 £ 522,948 0 0
- Rolling-stock: 500 £ 522,948 0 0
- Stations: 150 £ 522,948 0 0
- Add for Steel Rails (7 miles): 110 £ 522,948 0 0
- Stores (distribution of): 50 £ 522,948 0 0
- Telegraph: 75 £ 522,948 0 0
- Temporary Works: 100 £ 522,948 0 0
- Transport of Materials: 150 £ 522,948 0 0
- Water Supply: 5 £ 522,948 0 0

10 per cent. for Contingencies: 5 £ 522,948 15 0

Total: 5 £ 522,948 5 0
**Route No.7 – From a point near Stellenbosch Vallie on No. 6, to Scietkuil on No. 2.**

<table>
<thead>
<tr>
<th>Estimated distance</th>
<th>Miles.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>38</td>
</tr>
<tr>
<td>Sidings</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
</tr>
</tbody>
</table>

**Bridges:**

<table>
<thead>
<tr>
<th>Span in Feet</th>
<th>No.</th>
<th>Rate.</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>2</td>
<td>750</td>
<td>1,500</td>
<td>0</td>
<td>0</td>
<td>6,500</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>180</td>
<td>1</td>
<td>6,500</td>
<td>8,000</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Earthwork:**

<table>
<thead>
<tr>
<th>No. of Miles</th>
<th>Rate per Mile.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£</td>
</tr>
<tr>
<td>5 ½</td>
<td>300</td>
</tr>
<tr>
<td>10</td>
<td>400</td>
</tr>
<tr>
<td>5 ½</td>
<td>500</td>
</tr>
<tr>
<td>6¼</td>
<td>600</td>
</tr>
<tr>
<td>6¼</td>
<td>1,000</td>
</tr>
<tr>
<td>4¼</td>
<td>1,500</td>
</tr>
<tr>
<td>1</td>
<td>2,700</td>
</tr>
<tr>
<td>¾</td>
<td>6,750</td>
</tr>
</tbody>
</table>

**Rate per Mile.**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1,650</td>
<td>0</td>
</tr>
<tr>
<td>4,000</td>
<td>0</td>
</tr>
<tr>
<td>2,750</td>
<td>0</td>
</tr>
<tr>
<td>4,050</td>
<td>0</td>
</tr>
<tr>
<td>6,250</td>
<td>0</td>
</tr>
<tr>
<td>6,375</td>
<td>0</td>
</tr>
<tr>
<td>2,700</td>
<td>0</td>
</tr>
<tr>
<td>5,062</td>
<td>10</td>
</tr>
</tbody>
</table>

**Total: 32,837 10 0**

**Ballasting including Maintenance during Construction**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>20,000</td>
</tr>
</tbody>
</table>

**Cottages (Platelayers’)**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>4,000</td>
</tr>
</tbody>
</table>

**Culverts**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>20,000</td>
</tr>
</tbody>
</table>

**Engineering, Surveying and Offices Expenses.**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>12,000</td>
</tr>
</tbody>
</table>

**Housing Workmen**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>4,000</td>
</tr>
</tbody>
</table>

**Level Crossings Gradient and Mile Posts, Signals, &c.**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>2,000</td>
</tr>
</tbody>
</table>

**Losses on Live-stock and Plant**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>4,000</td>
</tr>
</tbody>
</table>

**Permanent Way**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1,300</td>
<td>52,000</td>
</tr>
</tbody>
</table>

**Road Laying**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>4,000</td>
</tr>
</tbody>
</table>

**Rolling-stock**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>20,000</td>
</tr>
</tbody>
</table>

**Stations**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>4,000</td>
</tr>
</tbody>
</table>

**Stores (distribution of)**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>3,000</td>
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</tbody>
</table>

**Temporary Works**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>4,000</td>
</tr>
</tbody>
</table>

**Transport of Materials.**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>10,000</td>
</tr>
</tbody>
</table>

**Water Supply**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>4,000</td>
</tr>
</tbody>
</table>

**Add for Steel Rails (6 miles)**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>660</td>
</tr>
</tbody>
</table>

**Total for Steel Rails (6 miles):**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>208,497</td>
<td>10</td>
</tr>
</tbody>
</table>

**10 per cent. for Contingencies**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20,849</td>
<td>15</td>
</tr>
</tbody>
</table>

**Total:**

<table>
<thead>
<tr>
<th>£</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>229,347</td>
<td>5</td>
</tr>
</tbody>
</table>
Route No. 8 – From a point near Kruidfontein on No. 6 to Secretaars Kraal on No. 7.

Miles.
Estimated distance 19
Sidings 1
Total 20

Bridges:

<table>
<thead>
<tr>
<th>Span in Feet</th>
<th>No.</th>
<th>Rate.</th>
<th>£</th>
<th>s. d.</th>
<th>£</th>
<th>s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>2</td>
<td>600</td>
<td>1,200</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>1</td>
<td>1,000</td>
<td>1,000</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>1</td>
<td>2,000</td>
<td>2,000</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>1</td>
<td>10,000</td>
<td>10,000</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14,200</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Earthwork:

<table>
<thead>
<tr>
<th>No of Miles</th>
<th>Rate per Mile</th>
<th>£</th>
<th>s. d.</th>
<th>£</th>
<th>s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>300</td>
<td>900</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3½</td>
<td>500</td>
<td>1,750</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3¼</td>
<td>700</td>
<td>2,275</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3½</td>
<td>1,000</td>
<td>3,250</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>4½</td>
<td>1,500</td>
<td>6,750</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2,700</td>
<td>5,400</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>½</td>
<td>3,000</td>
<td>1,500</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Rate per Mile</td>
<td></td>
<td>21,825</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Ballasting, including Maintenance during Construction 500 10,000 0 0
Cottages (Platelayers’) 100 2,000 0 0
Culverts 500 10,000 0 0
Engineering Surveying and Office Expenses 350 7,000 0 0
Housing Workmen 100 2,000 0 0
Level Crossings, Gradient and Mile Posts, Signals, &c 50 1,000 0 0
Losses on Live-stock and Plant 100 2,000 0 0
Permanent Way 1,230 24,600 0 0
Road Laying 100 2,000 0 0
Rolling-stock 500 10,000 0 0
Stations (provided per No. 7) 75 1,500 0 0
Stores (distribution of) 100 2,000 0 0
Temporary Works 200 4,000 0 0
Transport of Materials 250 5,000 0 0
Water Supply 100 2,000 0 0
Add for Steel Rails (3 miles) &emsp;&emsp;&emsp;&emsp;&emsp;110 &emsp;&emsp;330 &emsp;0 &emsp;0 &emsp;&emsp;&emsp;&emsp;&emsp;121,455 &emsp;0 &emsp;0
10 per cent. for Contingencies &emsp;&emsp;&emsp;&emsp;121,45 &emsp;10 &emsp;0 &emsp;&emsp;&emsp;&emsp;&emsp;Total &emsp;133,600 &emsp;10 &emsp;0 /

**Comparative Estimate of Distance and Cost for Junctions of Midland and Western Systems at Salt River, Secretaars Kraal, Schietkuil and Richmond, respectively.**

### Junction at Nels Poort.

<table>
<thead>
<tr>
<th>Route</th>
<th>Length in Miles</th>
<th>Cost per Mile</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaufort West of Nels Poort</td>
<td>32</td>
<td>5,892</td>
<td>£188,558</td>
</tr>
<tr>
<td>Aberdeen Road to Nels Poort</td>
<td>92½</td>
<td>5,638</td>
<td>£522,947</td>
</tr>
<tr>
<td>Nels Poort to Richmond</td>
<td>77½</td>
<td>6,409</td>
<td>£496,678</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>£1,208,183</td>
</tr>
</tbody>
</table>

### Junction at Skeitikuil.

<table>
<thead>
<tr>
<th>Route</th>
<th>Length in Miles</th>
<th>Cost per Mile</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaufort West to Skeitkuil</td>
<td>74½</td>
<td>6,237</td>
<td>£464,707</td>
</tr>
<tr>
<td>Aberdeen Road to Skeitkuil</td>
<td>102¼</td>
<td>5,700</td>
<td>£585,675</td>
</tr>
<tr>
<td>Skeitkuil to Richmond</td>
<td>35</td>
<td>6,300</td>
<td>£220,500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>£1,270,882</td>
</tr>
</tbody>
</table>

### Junction at Richmond.

<table>
<thead>
<tr>
<th>Route</th>
<th>Length in Miles</th>
<th>Cost per Mile</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaufort West to Richmond</td>
<td>109½</td>
<td>6,258</td>
<td>£685,231</td>
</tr>
<tr>
<td>Graaff-Reinet to Richmond</td>
<td>89</td>
<td>10,421</td>
<td>£927,531</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>£1,612,762</td>
</tr>
</tbody>
</table>

### Junction at Richmond.

<table>
<thead>
<tr>
<th>Route</th>
<th>Length in Miles</th>
<th>Cost per Mile</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaufort West to Secretaars Kraal</td>
<td>66</td>
<td>6,046</td>
<td>£399,027</td>
</tr>
<tr>
<td>Aberdeen Road to Secretaars Kraal</td>
<td>83½</td>
<td>5,622</td>
<td>£470,842</td>
</tr>
<tr>
<td>Secretaars Kraal to Richmond</td>
<td>54</td>
<td>6,207</td>
<td>£335,178</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>£1,205,047</td>
</tr>
</tbody>
</table>
### Statement of Approximate Cost per Mile of the Various Routes.

<table>
<thead>
<tr>
<th>Route No.</th>
<th>Cost (£)</th>
<th>Estimated Distance</th>
<th>Approximate Rate per Mile (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1,292,315</td>
<td>224</td>
<td>5,769</td>
</tr>
<tr>
<td>2</td>
<td>1,686,892</td>
<td>109½</td>
<td>6,273</td>
</tr>
<tr>
<td>3</td>
<td>927,531</td>
<td>89</td>
<td>10,421</td>
</tr>
<tr>
<td>4</td>
<td>836,701</td>
<td>146</td>
<td>5,731</td>
</tr>
<tr>
<td>5</td>
<td>400,067</td>
<td>63</td>
<td>6,350</td>
</tr>
<tr>
<td>6</td>
<td>522,947</td>
<td>92¼</td>
<td>5,638</td>
</tr>
<tr>
<td>7</td>
<td>229,347</td>
<td>38</td>
<td>6,035</td>
</tr>
<tr>
<td>8</td>
<td>133,600</td>
<td>19</td>
<td>7,031</td>
</tr>
</tbody>
</table>

J. F. STATTER.
Correspondence having Reference to Construction of Railways in Territory of Bechuanaland (Cape Town: Government Printer, 1889).

CAPE OF GOOD HOPE.

CORRESPONDENCE
HAVING REFERENCE TO
CONSTRUCTION OF RAILWAYS
IN TERRITORY OF
BECHUANALAND.

Presented by His Excellency the Officer Administering the Government and Her Majesty’s Acting High Commissioner, in reply to Address from the House of Assembly.

CAPE TOWN:

[...]

1889. /
Lord Knutsford to Sir H. Robinson.

Downing Street,
2nd July, 1888.

South Africa.
No. 77.

Sir, – I transmit to you for your information the enclosed copies of correspondence between Lord Gifford, V. C., Chairman of the Bechuanaland Exploration Company, and this Department, relative to a scheme for a Railway in British Bechuanaland, and I have to request that, after such consultation as you may deem necessary with Sir S. Shippard, you will favour me with a full and detailed expression of your views on the various points connected with the scheme which are raised in the present correspondence.

For the present, as I have informed you by telegram, I think it reasonable that you should refrain from entertaining any competing proposals for a Railway Concession which you may receive from other parties. And it will also be desirable to discontinue for the present the issue of any grants of farms or even near to the Eastern Frontier of British Bechuanaland.

I am aware that the only land already granted which the Government can hand over to the Company free of expense is land forming part of a quitrent farm ‘which has not been improved by cultivation, irrigation or otherwise.’

I have, &c.,
(Signed) KNUTSFORD,

The Right Honourable
Sir Hercules Robinson, G. C. M. G., &c., &c., &c.

Lord Gifford to the Colonial Office.

Copy.

The Bechuanaland Exploration Company, Limited,
14, George Street, Mansion House, E. C.,
London, 30th May, 1888.

Sir, – Adverting to the interview you kindly gave myself and Mr. Cawston yesterday on the subject of the Bechuanaland Concession, at which we were enabled to satisfy you of the influential position of the majority of the persons interested in the Company, I have now the honour to inform you that it is considered desirable to develop the resources of South Africa in the direction of Shoshong as rapidly as possible.
With this object in view I have been requested to ascertain whether the Secretary of State will be prepared to entertain a proposal for extending the railway system from the frontier of Bechuanaland to Vryburg, provided the Cape Government agree to extend this railway system to the border of Bechuanaland.

I need hardly point out that the Cape Government will greatly benefit by the proposed Railway, as it will secure the chief trade of the interior passing over her system, and the railway would become the main trade route to the north, passing through British territory.

Should the Government be prepared to consider this suggestion I shall, on learning the Secretary of State’s views, at once lay before his Lordship proposals, and ask for the right to construct the line and such financial assistance, either in the form of a guarantee or otherwise, which will enable the concessionaries to carry the Railway through without delay.

I have, &c.,

(Signed) GIFFORD.

To Sir Robert Herbert, K. C. B.,
Permanent Under Secretary of State for the Colonies,
Downing Street, S. W. /

LORD GIFFORD TO THE COLONIAL OFFICE.

Copy.

14, George Street, Mansion House, E. C.,
London, 12th June, 1888.

Sir, – I have the honour to acknowledge the receipt of your letter of the 9th instant.

I shall forthwith communicate with the Government of the Cape Colony as to the construction of the line from Kimberley to the Frontier of Bechuanaland, and on the receipt of a satisfactory reply the financial group I represent will make application for grants of land, and will have no difficulty in giving the guarantee you mention.

I have, &c.,

(Signed) GIFFORD,
Chairman.

To Sir Robert Herbert, K. C. B.,
Permanent Under Secretary of State for the Colonies,
Downing Street,
Lord Gifford to Colonial Office.

14, George Street, Mansion House, E. C.,
London, 18th June, 1888.

Sir, – Since my letter to you of the 12th instant I have the honour to inform you that the financial group with whom I am associated have been in communication with the Government of the Cape Colony, and learn that the Cape Government contemplate introducing into their Parliament a Bill for the extension of the line from Kimberley to nearly the boundary line between the Cape Colony and British Bechuanaland, and that, if terms are arranged for the construction of the line in Bechuanaland, the Cape Government will extend their line to the frontier.

In these circumstances I beg to request that the Secretary of State for the Colonies will grant me an interview, when I can introduce those associated with me, with a view to determine the basis upon which our arrangements for the construction of the Railway in Bechuanaland can be matured. It is apparent that, at the present nominal value of land in Bechuanaland, it would be almost impossible to make sufficiently large land grants to cover the cost of constructing the Railway. The revenue from land might, however, be supplemented by a light railway tax on land, the value of which is increased by the existence of the Railway; the right to lay out townships and the disposition of the town lots by sale on lease or freehold, as considered most desirable; the sharing upon equal proportions with the Government of the licences paid at the gold-fields which are being or may be hereafter discovered; the right to fuel on Crown lands through which the Railway passes; the right to let or use water obtained by artesian wells or any other process.

I have, &c.,
(Signed) GIFFORD,
Chairman.

To Sir Robert Herbert, K. C. B.,
Permanent Under Secretary of State for the Colonies,
Downing Street, S. W. /

The Colonial Office to Lord Gifford.

Copy.

Downing Street,
30th June, 1888.

My LORD, – I am directed by Lord Knutsford to acquaint you that he has given his careful consideration to the proposals relative to the construction of a Railway in British Bechuanaland brought before him in your letters of the dates
noted in the margin, and at the interview which took place between you and
other gentlemen and his Lordship on the 26th instant.

Lord Knutsford understood from the Deputation that they have received a
communication from the Cape Government in reply to a proposal which they
had made to construct the northward extension of the Kimberley Railway, to
the effect that the Cape Government has decided to carry that line to within a
few miles of the Cape frontier, and is favourable to its further extension by your
company into British Bechuanaland, and that your Company consider that, if
sufficient assistance can be given them, they may be able at present to construct
some 60 or 70 miles along the Transvaal frontier to some point near Vryburg.

Lord Knutsford cannot doubt that the construction of such a line would
be of great advantage to British Bechuanaland, and, subject to the opinion of
the Governor, who must of course be consulted before any definite undertaking
can be given, his Lordship thinks that it may be possible to entertain some at all
events of the suggestions which have been made for assisting the Company to
construct and work a Railway.

Lord Knutsford is not unfavourable to the principle of imposing a light grad-
uated tax on land directly benefitted and increased in value by the passage of the
Railway through or near it, and will desire Sir H. Robinson to consider what
amount of tax could be so laid upon land, and up to what distance from the line
the lower rate of land tax could properly be charged.

The request to be allowed to lay out and sell town sites along the line of
railway may also be entertained. The places selected would, of course, have to
be approved by the Government, and, if not on Crown lands or Crown Reserves,
would have to be acquired in the lawful manner for the purpose, and arrange-
ments could be made for deferring the sale of such portions as might be reserved
to the Government. Lord Knutsford does not feel able to give any assurance as
to the proportion, if any, of the money received for mining licences which might
be allotted to the Company in assistance of the railway construction, but he will
consult the Governor on the point.

As to fuel, Lord Knutsford is very doubtful whether the little timber which
exists on the line of railway to Vryburg would be of any value to the Company.

The country has, in fact, been denuded of fuel for some years, in consequence
of the demand for it at the Diamond Fields.

The Governor will have to consider whether in any districts where timber is
abundant a concession to cut it might be granted to the Company under proper
control.

The proposal to be allowed to raise a revenue from water raised by the Com-
pany from artesian wells or otherwise may be admitted for consideration.

The same remark applies to the request to be protected, for a term of years,
from the competition of any line through British Bechuanaland within a dis-
tance to be defined, and to have the sole right to construct branch lines within the Province in connection with the main line. Such a monopoly would be subject to the maintenance or an efficient service on the protected lines, according to conditions to be laid down in the definite concession, and should the Company fail within a reasonable time to construct / any branch which, in the opinion of the Government, is required and would carry a remunerative traffic, a concession may be given to other parties for such branch.

At the recent interview the Company finally asked that no offer from any other party for a Railway concession in British Bechuanaland should be entertained during the period that may be required for making a survey of the line of route and for the consideration of their proposals as above stated.

This appears reasonable to Lord Knutsford, and Sir H. Robinson will be desired by telegraph not to entertain for the present any other proposals, as the Company’s application is about to be referred to him at once for his consideration.

I am, &c.,
(Signed) J. BRAMSTON.

The Lord Gifford, V. C.

COLONIAL OFFICE TO GOVERNOR.

Copy.

South Africa,
No. 89.

Downing Street,
16th July, 1888.

STR. – I am directed by the Secretary of State to transmit to you for your information, with reference to Lord Knutsford’s despatch No. 77 of the 2nd instant, the documents specified in the annexed schedule.

I have, &c.,
(Signed) ROBERT G. W. HERBERT.

The Officer Administering the Government of South Africa.

Date. Description of Document.
5th July, 1888. Lord Gifford to the Colonial Office, relative to the construction of a railway to the Zambesi.
14th July, 1888. Colonial Office to Lord Gifford in reply to above. (Copies).
Construction of Railways in Territory of Bechuanaland

Lord Gifford to Colonial Office.

Copy.

14, George Street, Mansion House, E. C.,

Sir, – I have the honour to acknowledge the receipt of your letter dated Downing Street, 30th June, 1888, informing me that Lord Knutsford has given his careful consideration to the proposals relative to the construction of a Railway in British Bechuanaland brought before him by myself and other gentlemen. At the present time it appears that no further steps can be taken without reference to the authorities in Cape Town, consequently it is proposed to request Mr. Murray, a gentleman well acquainted with South African affairs, and who, it is believed, will be acceptable to the Secretary of State, to proceed to the Cape Colony, in order that the High Commissioner may be able to state to our representative his views, time and correspondence being saved by this arrangement.

It is, I venture to hope, understood that should my Company carry out the Railway to Vryburg to the satisfaction of the Government, and should my Company be desirous of extending the line in the direction of the Zambesi, the right to do so by them will be upheld by the British Government, Native Reserves being respected in every instance. / 

I desire to point out that it is trusted that from this date, and whilst the survey is being made, Government lands along the probable route of the Railway will not be disposed of.

My Company, in conclusion, desire to express to Lord Knutsford their thanks for the instructions conveyed by telegrams to Sir Hercules Robinson.

I have, &c.,

(Signed) GIFFORD,
Chairman.

John Bramston, Esq., C. B.,
Assistant Under Secretary of State for the Colonies,
Downing Street, S. W.

Colonial Office to Lord Gifford, V. C.

Copy.

Downing Street,
14th July, 1888.

My Lord, – I am directed by Lord Knutsford to acknowledge the receipt of your letter of the 5th instant on the subject of the construction of a Railway in British Bechuanaland.
With reference to the subject of the extension of the line from Vryburg to the Northern Border of British Bechuanaland and thence through the Bechuanaland Protectorate, I am to acquaint you that the grant of the right to carry the Railway through the territories of protected native chiefs will be a matter for negotiation between your Company and those chiefs whose territory would be traversed by the proposed Railway; but I am to add that Her Majesty’s Government would always be willing to induce the chiefs, as far as it should be able to do so by the fair exercise of its influence, to agree to reasonable arrangements in the matter.

I am, &c.,

(Initd.) J. B.

Sir H. Robinson to Lord Knutsford.

Government House, Cape Town, 26th September, 1888.

My Lord, – With reference to your Lordship’s dispatch No. 77, of the 2nd July last, I have the honour to enclose for your information a copy of a despatch which I have received from the Acting Administrator of British Bechuanaland covering memoranda on the proposal to grant a concession of the right to construct a Railway in British Bechuanaland.

When I receive Sir Sidney Shippard’s Report I will forward it, with my own observations on the subject.

I have, &c.,

(Signed) HERCULES ROBINSON,
Governor and High Commissioner.

The Right Honourable Lord Knutsford, G. C. M. G.,
&c., &c., &c.,
Colonial Office.

Sir S. Shippard to Sir H. Robinson.

Administrator’s Office, British Bechuanaland,
Vryburg, 5th September, 1888.

No. 205G.

Sir, – I have the honour to inform your Excellency that I transmitted your despatch No. 157b, of the 3rd instant, covering the correspondence respecting the
Construction of Railways in Territory of Bechuanaland

49

proposed Railway concession in this Colony, to the Surveyor-General, for an expression of his views on the proposals contained in Lord Gifford's letter of the 18th June last. I enclose for your Excellency's information a copy of Mr. Duncan's memorandum on the subject. In accordance, however, with your Excellency's instructions the papers will be held over until the return of the Administrator enables him to report on the matter, as desired by the Secretary of State.

I have also the honour to enclose, for your Excellency's information, copy of a memorandum, written by myself, on the correspondence forwarded in the dispatch from the Secretary of State.

I have, &c.,
(Signed) F. J. NEWTON, Acting Administrator.
His Excellency the Governor,
Cape Town.

Remarks on proposed Railway Concession by the Surveyor-General.

Copy.

Light Graduated Tax on Land.

The land which could be made subject to this tax – at least for the present – lies wholly within British Bechuanaland, and the sphere of attraction of the Railway would probably be all that portion of British Bechuanaland which lies to the eastward of a line drawn from the south-western extremity of the Taung Native Reserve towards Honing Vlei. This would embrace an area of, roughly, 15,000 square miles. Of this about 2,200 square miles is held by tribal tenure by a native population of approximately 45,000 souls, or, say, 12,000 adult males. (Blue Book, C. 4889.)

Of the remainder, viz., 12,800 square miles, about 4,900 square miles is held in severalty of 490 persons, and the balance (7,900 square miles) is available for sale. As a general rule, each farm held in severalty has an approximate area of 10 square miles.

The tax, therefore, levied upon present and prospective holders in severalty within the sphere of attraction would be borne by approximately 1,280 persons.

Of the 4,900 square miles held in severalty, about one-third is in actual occupation (vide Blue-book, C. 5363, p. 21, treating of a portion which may be fairly assumed to govern the whole).

Each farm at present unoccupied and available for sale (that is \(2/3 \times 4,900 + 7,900\) square miles, or, roughly, 1,100 farms) would require an expenditure of
about £300 before the proprietor could live upon it, and a profitable return is not looked for in this territory for two or three years.

In endeavouring to estimate the amount to be levied I assume that the Company would not be content with less than eight or ten thousand pounds per annum, or say one per cent. on the cost of construction to Mafeking, a distance of 160 miles.

Thus to levy £8,000 on 12,800 square miles would represent a tax whose average would be £6 5s. per farm, the distribution of which would vary probably from £9 on farms near the railway to £3 on farms in the outlying districts.

There can be little doubt that farms through or near which the Railway runs would derive substantial benefit and be increased in value, and £9 per annum non commutable tax on adjacent farms might be found not to be an exorbitant impost, other things being equal. But in this instance the Railway will run along the Transvaal border. The Transvaal farmers, therefore, would derive an advantage from the proximity of the Railway equal to that enjoyed by the majority* of the Bechuanaland farmers, with the additional advantage of being untaxed by the railway which serves them.

This would tend to throw Bechuanaland farms out of cultivation, with the result of diminishing traffic returns, unless a differential rate were imposed upon Transvaal produce.

But a differential rate could not be imposed, even were it practicable, unless the cost of administration were increased by the establishment of the necessary Custom-houses on the frontier.

If, then, a tax of appreciable value to the Company were imposed it is possible that the Government would require an increase of the grant-in-aid, for it is to be apprehended that the result of establishing Custom-houses on the border would result in a diversion of the Western Transvaal trade to Natal.

On the other hand, if a light railway tax were imposed, say £1 10s. per farm, as in the Transvaal, the Company would receive upon 12,800 square miles of land only £1,920 per annum.

If the estimated returns are such that a subvention of such an amount be considered of some moment to a Company contemplating the expenditure of three-quarters of a million of money, it would then devolve upon the Government to consider whether an increase of a couple of thousand pounds in the subsidy for carrying the mails would not be preferable to levying by proclamation a direct tax upon an unrepresented community.

It is not stated in the correspondence whether the tax will be levied upon Native Reserves.

* There will be left a majority when the area between the Railway and the Border and the corresponding area on the western side of the Railway are deducted.
2. The Crown land through and near which the Railway will pass is now reserved until the negotiations have been completed. Without special legislation the Government has not the power to expropriate any portion of a farm held in quitrent tenure for the purpose of laying out a township, with or without compensation. The Company will no doubt be able to purchase from owners such farms as may be required, but the owners cannot be compelled to sell. If the company acquires any such farm it can lay out a township without reference to the Government.

3. There is little if any Crown land on the probable line of rail. A tract of land to the westward, upon which there is timber, might be leased to the Company, who could appoint their own Conservator of Forests.

(Signed) A. H. F. DUNCAN,
Surveyor-General.

Vryburg,
16th August, 1888.

Administrator’s Office,
Vryburg, British Bechuanaland.

Memo. On proposed Railway Concession.

Adverse criticism of these proposals on any broader grounds than the facts and figures set forth by Mr. Duncan appears to be a task requiring some delicacy of treatment, and I trust I may be forgiven for presenting the following considerations to your Excellency’s notice:

In Lord Gifford’s letter of the 30th May it is stated, in the first paragraph, that ‘it is considered desirable to develop the resources of South Africa in the direction of Shoshong as rapidly as possible,’ and ‘with that object in view’ a proposal is submitted for extending the railway system from the frontier of Bechuanaland to Vryburg.

In the following letter of the 12th June Lord Gifford announces the intention of the ‘financial group’ which he represents to make application for grants of land; and in his next letter of the 18th June he gives a sketch of the ‘basis upon which arrangements for the construction of the railway in Bechuanaland can be matured.’ From these quotations, taken in connection with the basis of arrangement sketched out by him, it would appear that, while it is the object of the ‘financial group’ to ‘develop the resources of South Africa in the direction of Shoshong as rapidly as possible,’ yet that ‘the basis upon which the arrangements can be matured’ is that British Bechuanaland should be the chief if not the sole initial contributor to the construction of a comprehensive railway scheme.

Bechuanaland is certainly no ‘arid desert,’ as it was hastily described by a well known Cape politician a short time ago. At the same time it is a country with
no immediate resources of its own, and one in which capitalists do not appear eager to invest. How far they will be attracted by the prospect of a railway may be left for the decision of any one who will examine the figures and facts in Mr. Duncan’s memorandum.

While it is evident that a large proportion of the expenses is sought to be charged upon the land and the inhabitants of the Colony, it would be idle to contend that the chief advantages of the scheme will be correspondingly secured. The object of that scheme, as stated in Lord Gifford’s letter, is the development of South Africa as far as Shoshong, and, according to a later letter, up to the Zambesi; from which, no doubt some advantages would be gained by landowners and residents in this Colony – nothing, however, so substantial as to compensate for the severe taxation and loss which are suggested in the ‘basis for arrangements’ already alluded to.

The towns in Bechuanaland, viz., Taungs, Vryburg and Mafeking, are but places by the wayside, and are in no way either great depots for agricultural produce requiring means of transport or important centres of industry calling for expansion. No doubt the farmers in the neighbourhoods of those towns would gladly avail themselves of the advantages a railway would afford; but at the same time neither they nor the other residents in the Colony nor the Colony itself can afford to pay the price asked for them. To expect them to do so would, to compare great things with small, nearly resemble a proposal that the inhabitants of Port Said, Ismailia, and Suez should materially contribute to the construction and maintenance of the Suez Canal. British Bechuanaland is at present but a very little more than the highway between the Cape Colony and Kimberley in the south and the Gold Fields and unknown Interior in the north. The lapse of time and the investment of capital will no doubt effect much for its development, but at present it is unable to bear the burden that is sought to be put upon it. From the foregoing I do not wish it to be understood for a moment that British Bechuanaland would not in any way be benefitted by a Railway, but that it is neither reasonable nor just to expect that Colony to contribute to the extent asked for by the promoters of this scheme.

The Surveyor-General in his memorandum has only dealt with those proposed sources of revenue which are mentioned in the letter to the Colonial Office of the 18th June as possible methods of supplementing the revenue from land. Lord Gifford and those associated with him evidently rely on securing to their Company so substantial a grant of land as to render entirely subsidiary those five sources of revenue, to the granting of which the Secretary of the State is apparently not prepared to offer any serious objection. Owing to the difficulties, however, in the way of imposing a ‘light railway tax,’ as set forth by Mr. Duncan, the questionable advantages to be gained from the privilege of laying out townships in Bechuanaland, and the entire absence of timber for fuel on
Crown lands through which the railway would be likely to pass, Lord Gifford and his undisclosed principals are not likely to ask for any grant of less extent than what they had originally hoped to obtain from Lord Knutsford.

By a reference to Mr. Duncan’s memorandum it will be seen that there are only 7,900 squares miles in what he describes as the ‘sphere of attraction’ available for disposal, that is, sufficient land to let out to some 790 persons in farms.

The object of obtaining a substantial grant of land is, it may be presumed, the development of such land by means of immigration, so as to procure increased material for traffic on the railway. Any immigration scheme having so considerable an object in view must, to be successful, be conducted on a large scale, so that of these remaining 790 farms there would probably be very few left in the possession of the Government. Without wishing it to be inferred that this would be matter for regret, it may well be asked, ‘If all the available Crown lands, sources of revenue, and powers of taxation are to be absorbed in promoting this undertaking, why continue the present heavy expenditure over the internal government of the Colony merely for the benefit of this Company?’

The road to the north has been secured to the empire; the private rights of individuals are in no danger; freebooters have gone elsewhere, and law and order prevail. Why, then, should her Majesty’s Government continue at great expense to carry on the civil administration of what is never likely to be to it a remunerative Colony? It would be more reasonable to cede at once by charter to such a Company the entire management of the territory, than to continue to administer it while disposing of its most valuable assets on the lines proposed by Lord Gifford.

Other reasons, however, would interfere with the possibility even of such a cession, into which it is not necessary here to go. But it is at this point that a new factor, viz., the Cape Colony, appears. How would such a concession of land, rights, and privileges as that proposed affect the ultimate destination of the Colony of British Bechuanaland?

Were the undertakings of this association purely limited to a railway enterprise, there are, I believe, generally accepted forms of agreement, by which, when the time comes, the transfer of the Railway could be easily accomplished, and the system incorporated with that of the Government Railways of the Cape Colony. But when so large a territorial scheme is introduced as an indispensable adjunct to the Railway, it is only natural to expect that, on the one hand, in the event of its turning out a success the Company will be indisposed to sell, and, on the other hand, in the events of its failure, the Cape Colony may not care to buy.

Is it advisable, therefore, to place what may turn out to be widely extended powers over public interests in this portion of South Africa in the hands of a private association, and would it not be wiser to allow the advance of the Railway to proceed in its ordinary course and in a natural manner under the auspices of
a Government which is already responsible for the working of so much of the South African Trunk Railway as is at present in existence?

(Signed) F. J. NEWTON. /

SIR H. ROBINSON, G. C. M. G., TO LORD KNUTSFORD, G. C. M. G.

Copy.

Government House,
Cape Town, 31st October, 1888.

South Africa,
No. 503.

My LORD, – I have the honour to forward, for your Lordship’s consideration, a copy of a despatch which I have received from the Acting Administrator of British Bechuanaland, covering communications from Mr. R. W. Murray, setting forth the conditions on which the Bechuanaland Exploration Company are prepared to carry out the construction of a railway through Bechuanaland, together with the Surveyor-General’s report on the proposals.

2. It appears to me that there is little use in considering the question of a Railway through Bechuanaland until it has first been ascertained whether the Cape Colony will either itself extend its railway system to the Bechuanaland border or else allow a company to do so. The question of northern extension from Kimberley involves political considerations, in which the Orange Free State and the South African Republic are interested. The subject is now engaging the attention of the Cape constituencies, and a decision cannot be come to upon it until the new Parliament shall have assembled in May next. If that decision should be adverse to extension northwards, the idea of a Railway through Bechuanaland may be dismissed from immediate consideration.

3. If, on the other hand, the decision should be favourable, it appears to me the first step should be to frame an approximate estimate as to the length and probable cost of a Railway through British Bechuanaland, as to the cost of maintenance and working expenses, and as to the probable receipts of the line under a reasonable tariff. Without some general idea on these points it is difficult to form any opinion as to whether the concessions now asked for in aid of the undertaking are reasonable or the reverse.

4. The present proposals ask for the following concessions in the Crown Colony of British Bechuanaland:–

   (1) 860,000 acres of land,
   (2) Mineral rights,
   (3) Irrigation monopoly and water rates,
   (4) A property tax, and
   (5) The laying out of townships.
Also the following concessions in the British Protectorate upon annexation:—

1. Alternate blocks of 10 square miles along the line,
2. A property tax,
3. Forest rights,
4. Mineral rights, and
5. A monopoly of irrigation, with water rates, extending to the Zambesi.

5. I think the whole of the proposals as regards the Protectorate, as also the proposal for the laying out of European townships in the Native Reserves in British Bechuanaland, are inadmissible. If the Protectorate and the ‘sphere of influence’ should ever be annexed, it is desirable that Her Majesty’s Government should retain a free hand to deal as may then seem proper with the rights and interests of the Natives, and with the claims of any Europeans who may have obtained land grants and mineral concessions from the Chiefs and their Councillors; whilst, as regards the establishment of European townships in the Native Reserves within British Bechuanaland, such a step would not only be prejudicial to the rights and interests of the Natives, but would involve also a distinct breach of faith.

6. As regards the other concessions asked for in British Bechuanaland, I can only observe that, in the absence of any estimate as to their value and of any information such as that to which I have referred, as to the probable annual deficiency on Railway working expenses and interest, it is impossible to form any decided opinion as to their fairness. My present impression, however, is that No. 4 (the property tax) is fair, that No. 3 (the irrigation scheme) is unpracticable, and that Nos. 1 and 2 (the land grants and mineral rights) would, in the event of the country proving auriferous, be altogether excessive. The proposals, too, appear to me so crude and ill-defined that, if assented to in their present shape, they might possibly involve Her Majesty’s Government in much future trouble and perhaps in costly litigation. The embarrassments entailed on the Government of the South African Republic by the concession which it granted to the Netherlands Railway Company before the gold discoveries had changed the whole condition of the country constitute a warning against the adoption by Her Majesty’s Government of a similar course.

7. It seems to me that if rich gold-fields should be discovered in British Bechuanaland, such as those which have been found in the adjoining Transvaal territory, the concessions asked for would pay for the Railway over and over again, and a large portion of the legitimate resources of the Colony, instead of being available for the advancement of its inhabitants, would be transferred in perpetuity to the shareholders of a London Joint Stock Company. If, on the other hand, gold-fields should not be found, the concessions asked for would practically have to be paid by the British taxpayers.

8. In explanation of this last point I may observe that, as far as can be foreseen at present, the Colony cannot in the absence of gold discoveries be self-supporting for many years to come. It will with the most rigid economy
be dependent on Imperial grants-in-aid. In these circumstances any sources of revenue paid to the Company which would otherwise go in reduction of the grant-in-aid will practically be a payment to the Company by British taxpayers. In such case it seems deserving of consideration whether, if Her Majesty’s Government desire to force on the immediate construction of a railway, a direct grant-in-aid from Imperial funds or an Imperial guarantee for a minimum rate of interest, would not be a more straight-forward and economical arrangement as regards the present than the complicated concessions asked for, whilst such a course would guard against a wasteful hypothecation of the proceeds of possible future prosperity.

But my advice to Her Majesty’s Government is to allow the question of a Railway through British Bechuanaland to remain in abeyance until at all events after the meeting here of the new Parliament. The present moment is not a favourable one for pressing on construction in the lasting interests of the Colony. The history of the Graham’s Town and Port Alfred Railway Company, in which both the shareholders’ capital and the Government contribution have been lost, furnishes a lesson on this subject which it will be well for all connected in any way with the talked of British Bechuanaland Railway to take to heart. Assuredly there is nothing now to enable such a Railway to pay even working expenses, to say nothing of interest on capital. If it were made by a private company it could, under existing conditions, only be kept open by a direct or indirect subsidy from Her Majesty’s Government. If, on the other hand, gold discoveries in British Bechuanaland should once become an established fact, the Railway would soon be made either by the British Bechuanaland Government on borrowed capital, or by a private company without any concession except the land.

I have, &c.,
(Signed) HERCULES ROBINSON,
Governor and High Commissioner

The Right Honourable
Lord Knutsford; G. C. M. G., &c., &c., &c.,
Colonial Office.

SIR S. SHIPPARD TO SIR H. ROBINSON.

Copy.

No. 248G.

Administrator’s Office,
British Bechuanaland,
Vryburg, 19th October, 1888.

Sir, – I have the honour to enclose for your Excellency’s information copies of two letters which I have received from Mr. R. W. Murray, one of which contains
a proposal setting forth the conditions under which the Company he represents will carry out the construction of the Bechuanaland Railway.

I have transmitted these letters for the consideration of the Surveyor-General, and beg to enclose copy of a Report which that officer has furnished on Mr. Myrray’s proposal.

I do not propose to offer any remarks on those conditions relating to land grants, mineral rights, or irrigation, which are matters exclusively within the province of those technically qualified to advise upon them.

The conditions under those heads are stated by Mr. Murray and generally approved by Mr. Duncan, and those gentlemen are better qualified to judge of them than myself.

Nor do I think it necessary to say anything on the subject of the proposed advantages to be given to the Company in the Protectorate. Besides the fact that those advantages consist also of land grants, rights to minerals, and powers for irrigation purposes, and are therefore also matters for professional opinion, the question is so entirely dependent on the course of events leading at some uncertain date to annexation, and on the conditions subject to which annexation may be effected, that no reliable estimate of their probable value could be arrived at even by conjecture.

I propose, therefore, only to deal with the questions under paragraphs 4 and 5 of Mr. Murray’s letter relating respectively to properties taxed (1) and townships (2).

(1) It will be seen that Mr. Murray has proposed that the property tax shall be instituted in lieu of ‘the light graduated railway tax,’ which formed the chief feature of the first set of proposals laid before the Secretary of State. It has been represented to Mr. Murray, and conclusively proved by Mr. Duncan, that such a Railway tax would be undesirable and at the same time of little pecuniary value to the Company, and Mr. Murray has readily withdrawn the idea, and substituted in its place a tax on the value of property, to be periodically assessed.

The proposal seems to commend itself on the broad ground that if it is a good bargain for the Company the Government will get an equally good bargain; and that the value of the tax will be enhanced by the development of the resources of the country; moreover, the rate suggested appears to be reasonably low. A farmer holding a farm in this district, for instance, where the average value of a farm is about £400, would have to pay a tax of £5. This he should be able to afford, but I am not prepared to endorse Mr. Duncan’s apprehension that there will be no serious opposition to it.

There appears to me to be no genuine distinction between the original light graduated railway tax proposed and favoured by Lord Knutsford, and the property tax now proposed; the idea has merely been altered by allowing the Government a share of the tax, and abolishing the principle of graduation of
the rate according to distance from the railway, that principle being merely preserved to determine the destination of the contribution.

It is worth considering whether, as a distinction is made between farms lying within 15 miles of either side of the proposed railway and farms lying without that distance, it would not be desirable to make some corresponding distinction in the rate of the taxation. / 

For instance, farms or portions of farms within that distance might fairly be called on to pay a tax at the rate of 1½, and farms without it at the rate only of 1 per cent.

The greatest considerations will in any case have to be given before such a tax is definitely decided on. The whole population of South Africa, and especially the farming population, is exceedingly sensitive to direct taxation of any kind. It was quite recently pointed out with some force, by one who is well acquainted with the country, that a man who thinks nothing of paying five and twenty pounds a year in indirect taxation makes a great grievance of having to pay a sovereign, perhaps, for house duty.

If, however, the retention of this item in the list of conditions is considered desirable, there is no doubt that the population of British Bechuanaland would consent to the burden rather than lose any chance of securing Bechuanaland, the more especially as there is comparatively little or no indirect taxation in British Bechuanaland.

The payment of such a tax on Native Reserves from a Native Reserve Fund would depend, I imagine, on the successful institution of another scheme of which such a fund forms a part, but I do not think there would ever be any disposition to question the liability of Native Reserves in this respect.

(2). As regards townships, Mr. Duncan very clearly points out that where there is a demand for a town there will a town naturally arise, and that there can be no objection to the Company endeavouring to promote the growth of townships on land acquired by them along the line of railway, but he has very properly taken exception to the institution of townships on Native Reserves.

It would, I imagine, be difficult for the Company to acquire sites for townships in Native Reserves, in view of the broad rules laid down that such reserves are inalienable. Indeed it would seem impossible to confer on the Company the power of securing such sites without receding from the obligations which we have incurred towards the Bechuanas, to the protection of whose rights and interests we are so strongly committed.

I have, &c.,

(Signed) F. J. NEWTON,
Acting Administrator.

His Excellency the Governor,
Cape Town.
Enclosure 1 in Despatch No. 248g, 19/10/88.

Mr. Murray to Mr. Newton.

Copy.

Vryburg, October 16th, 1888.

Sir, – I should esteem it as a great favor if the accompanying letter, containing the proposals for the construction of the Bechuanaland Railway, could be laid before His Excellency the High Commissioner with as little delay as possible.

The survey of the first section of the Railway will be completed by about this day week, and I am desirous of seeing the surveyors proceeding at once with the survey towards Mafeking.

I have, &c.,

(Signed) R. W. MURRAY.

His Honor F. J. Newton, Esq.,
Acting Administrator,
British Bechuanaland.

Enclosure 2 in Despatch No. 248g, 19/10/88.

Mr. Murray to Mr. Newton.

Copy.

Vryburg, October 16th, 1888.

Sir, – In continuation of my letter dated the 22nd August last to His Excellency the High Commissioner, I have now the honor to propose, on behalf of the Company which I represent, that the construction of the Bechuanaland Railway shall be carried out under the following conditions:–

1. Land Grants.

(a) That for the purpose of raising revenue the available Crown lands in British Bechuanaland which, I understand, are about 150,000 acres surveyed and 70,000 acres unsurveyed in the Maritsani district, shall be placed at the disposal of the Railway Company.

(b) Also a tract of country, say 1,000 square miles in extent, in the neighbourhood of Genesa. As it will be hereafter seen that I propose that the Company shall cause the payment of a property tax which will bring revenue to the Government, I anticipate that the Government will not be disinclined to increase the area if it is considered desirable in the interests
of the Company. The land grants shall be in the form of the present quit-rent tenure of British Bechuanaland, excluding the fiscal provisions.

2. **Mineral Rights.**

That the Company shall share with the Government half the revenue derived from the discovery of precious minerals and precious stones, after deducting the costs of local administrations.

3. **Irrigation.**

That the Company shall be empowered to promote the irrigation of all lands in British Bechuanaland by the preservation and improvement by artificial and other means of the supply and storage of water. The Company shall have the right to levy rates, to be called irrigation rates, upon all property irrigated and capable of being irrigated, regard being had to the value to be derived by the owners of property from irrigation works. The assessment of rates to be regulated by a Board consisting of a nominee of the Government, a nominee of the Company, and a local representative. Such rates shall not be levied until the Company is prepared to place the water upon the land. The Government to receive one per cent. of the irrigation revenue after deducting expenditure.

4. **Property Tax.**

This tax, which will be 1 ¼ per cent. of the value of the property periodically assessed, shall be divided between the Government and the Company upon the following basis:—

(a) The tax derived from all lands lying within 15 miles on either side of such lines of railway as shall be actually working shall be paid by the Government to the Company.

(b) The tax derived from all lands situated at a distance greater than fifteen miles from existent railways shall be retained by the Government.

(c) In reference to native reserves the tax shall be levied in the form of a contribution from the income of a Native Reserve Fund brought into existence by revenue raised from mineral discoveries, the dealing with land, and other sources. /

It will be seen that the Secretary of State in his despatch to the Company which I represent is not adverse to a railway tax, but I am led to believe that the Government of Bechuanaland apprehend some difficulty in levying such a tax. I therefore take the liberty of proposing this tax as an alternative.
5. **The laying out of Townships.**

In Lord Knutsford’s despatch of the 30th of June, 1888, the fifth paragraph reads as follows:— ‘The request to be allowed to lay out and sell town sites along the line of railway may also be entertained. The places selected would, of course, have to be approved by the Government, and if not on Crown lands or Crown reserves would have to be acquired in the lawful manner for the purpose, and arrangements could be made for deferring the sale of such portion as might be reserved to the Government.’

The term Crown Reserves I interpret as Native Reserves, and it will be, of course, to the advantage to those reserves to have townships in localities which will be selected by the Government. For instance, a township somewhere in the neighbourhood of Taungs, but at a sufficient distance so as not to affect the existing native settlement, will be a necessity.

6. **Land Grants in British Protectorate upon Annexation.**

\(a\) In case of annexation of the British Protectorate to the Crown, alternative blocks of land 10 square miles in extent along the line shall be granted to the Company.

\(b\) The grants to be made and the revenue to be derived in a similar manner to that proposed in (the preceding) clause 4.

\(c\) That the Government shall either make a grant of forest land adequate to the requirements of this Company, if such land is available; or, in the event of the creation of a Forest Department, the Government shall supply to the Company assorted wood to the value of 25 per cent. of the annual revenue derived from the sale of wood.

7. **Mineral Rights in the Protectorate.**

Mineral rights in the Protectorate upon annexation shall be conferred on the Company, similar to those granted as proposed in British Bechuanaland.

8. **Irrigation Works in the Protectorate.**

That the powers vested in the Company in respect of irrigation in British Bechuanaland shall be extended to the Company in case of the annexation of the Protectorate and the region within the sphere of British Influence beyond the Protectorate to the Crown.

I have, &c.,

(Signed) R. W. MURRAY.

His Honour F.J. Newton, Esq.,
Acting Administrator, British Bechuanaland.
Enclosure 3 in Despatch No. 248g, 19/10/88.

Remarks on Railway Proposals.

Copy.

1. Land Grants.

The area applied for embraces all the Crown land in the Maritsani District, confiscated police farms, and Rooi-grond commonage and erven not granted. Mr. Murray proposes to obtain powers from Government to resume possession of the nine erven already granted, by compensating the proprietors under the clause in the Title Deed permitting such resumption. The large block of 1,000 square miles lies between Genesa and Morokwen.

All land must be at least roughly surveyed before title can be issued.


I understand that this agreement has been already made, i.e., that half the net profits accruing to Government on discovery of the precious minerals or precious stones in payable quantities shall be paid to the Company.

It would be desirable to clearly lay down that, if for any sufficient reason the Government determines upon reducing the mining licence fees, &c., no hindrance shall be offered by the Company, and that the Company shall thereupon receive the reduced amount of its half share without other compensation.

3. Irrigation.

This scheme, it is believed, will be practicable and profitable to the Company.

Upon the lands acquired by the Company agricultural families may be placed upon conditions involving payment in the form of irrigation rates, and (which, by the way, Mr. Murray has inadvertently omitted) for water supplied.

Lands now held in severalty can be brought under the operation of the necessary proclamation on petition of a proportion of resident owners of a district. A clause must be inserted in the Proclamation compelling the Company to irrigate any district on petition or to waive their rights to irrigate such district.

The one per cent. net profit is to cover what little expenditure may be entailed upon the Government.

The detail as to the composition of the Board can be safely left until the draft proclamation is under consideration.
4. Property Tax.

I recommend the Government to agree to the tax. It has the advantage that the contribution to the revenue will increase with the value of the land; it will to a certain extent indirectly control unlimited land speculation, and will not interfere with the existing form of land tenure.

I do not apprehend that any serious opposition will be made to it, as persons who have spoken to me on the subject expect that a tax of some such nature will be shortly imposed. Should any difficulty arise the concession of a Legislative Council, composed of a President and four nominees of the Crown, with four unpaid elective members, might be made, while the portion of the cost of the Bechuanaland Border Police now really devoted to patrolling and implying a defence of the Protectorate, the Assistant Commissioner’s expenses, &c., might be placed to a separate account, thus tending towards an equalization of revenue and expenditure. The amount, 1 ¼ per cent., is I think reasonable.

5. The laying out of Townships.

If the Company wish to lay out townships along the line of Railway upon such land as may be lawfully acquired, that is, by purchase from individual proprietors, the Government can offer no objection; ground, however, for Government offices, &c., should be set apart for the Government.

Native Reserves are not Crown Reserves, and I think that there would be some difficulty in acceding to Mr. Murray’s request that townships may be laid out within them. Moreover, in the instance given, namely, within the Taungs Reserve, the proposed township would be at the wrong end of the Company’s line. There would be no export northward, and all produce carried southward would immediately cross over the Border on to the Colonial lines of railway. Where local industries are developed – such, for instance, as gold mining – townships will grow up naturally, and the Company can always run branch lines, if necessary. /


(a) These land grants could be made after the native territorial boundaries and necessary reserves have been defined.

(b) The property tax appears to me a good one, and I would recommend its extension to the Protectorate.

(c) A Forest Department will, I should think, be certainly organized, and 25 per cent. in value of the wood annually prepared for sale would be a fair proportion.

I would suggest that this clause be agreed to, on the understanding that a reasonable share be paid to the Government by the Company in the event of the latter obtaining a mining concession from native chiefs or from former concessionaries.

8. Irrigation in the Protectorate.

I should recommend the Government to agree to this condition also, reserving, however, the right to allow other persons to irrigate a district, should the Company not do so when called upon, and to use all natural reservoirs, &c., for such purpose.

In the main and subject to the above remarks, I should agree with the proposals made by Mr. Murray.

(Signed) A. H. F. DUNCAN,
Surveyor-General.

Vryburg,
October 17th, 1888.

Sir H. Robinson to Lord Knutsford.

Copy.

Government House,
Cape Town, 12th January, 1889.

South Africa,
No. 34.

My Lord, – I have the honour to forward for your consideration a copy of a correspondence which I have had with Mr. R. W. Murray, representing the Bechuanaland Exploring Company, with reference to the construction of a Railway through that territory.

2. Mr. Murray’s letter of the 12th instant submits amended proposals, copies of which I have transmitted to the Administrator for his report, and to Ministers for their information.

3. As soon as I hear from Sir Sidney Shippard on the subject I will communicate to your Lordship my opinion upon the proposals as they now stand.

I have &c.,

(Signed) HERCULES ROBINSON,
Governor and High Commissioner.

The Right Honourable Lord Knutsford, G. C. M. G.,
&c., &c., &c., Colonial Office.
Mr. Murray to Captain Bower.  

Copy.  

Cape Town,  
4th January, 1889.  

Sir, – I have the honour to forward to you, in accord with our conversation, the following draft of proposals, with space left for marginal notes, so that, in case His Excellency wishes to vary them, they may be so varied as to enable me to send in a proposal in a form in harmony therewith.  

I have, &c.,  
(Signed) R. W. MURRAY.  

Capt. Graham Bower, R. N., C. M. G.,  
Imperial Secretary,  
Cape Town.

Mr. Murray to Sir H. Robinson.  

Cape Town,  
4th January, 1889.  

Sir, – In accordance with interview which Sir Charles Metcalfe and myself have lately had with your Excellency and Sir S. G. A. Shippard, I have now the honour to submit the following amendment of the preliminary proposals lodged with the Acting Administrator of British Bechuanaland at Vryburg on the 16th October last, for the creation of revenue towards the construction and maintenance of a Railway from the borders of the Cape Colony through British Bechuanaland.  

Your Excellency will remember that, while appreciating the great advantages which this Railway would confer on the Cape Colony and the localities to the north, you were doubtful whether there were Crown lands sufficient or any other inducement in Bechuanaland itself to cause English financiers to undertake so costly a work as the construction of this Railway.  

The preliminary proposals of the 16th October were framed by me after obtaining all information courteously placed under instructions at my disposal by the officials of Bechuanaland.  

They were intended merely as a basis of negotiations and were necessarily crude. They have now had the advantage of criticism by your Excellency, and I have the honour to make the following proposals:–

1. Land Grants.  

(a) That for the purpose of raising revenue the available Crown lands in British Bechuanaland, which I understand are about 150,000 acres surveyed and 70,000 acres unsurveyed in the Maritsani District, shall be placed at the disposal of the Railway Company.
(b) Also a tract of country (say 1,000 square miles in extent) in the neighbourhood of Genesa.

As it will be hereafter seen that I propose the Company shall originate a property tax which will bring revenue to the Government, I anticipate that the Government will not be disinclined to increase the area if it is at all desirable in the interests of the Company.

The land grants shall be in the form of the present quitrent tenure of British Bechuanaland, excluding the fiscal provisions.


That the Company shall share with the Government half the revenue derived from the discovery of precious minerals and precious stones after deducting the costs of local administrations, or it shall receive 33 per cent. of the gross revenue accruing to Government, which would be equivalent to one-third of the half of the gross revenue.

3. Irrigation.

That the Company shall be empowered to promote the irrigation of all lands in British Bechuanaland by artificial and other means of the supply and storage of water. The Company shall have the right to levy rates to be called irrigation rates upon all property irrigated and capable of being irrigated, regard being had to the value to be derived by the owners of property from irrigation works.

The assessment of rates to be regulated by a Board consisting of a nominee of the Government, a nominee of the Company, and a local representative. Such rates shall not be levied until the Company is prepared to place the water upon the land. The Government to receive one per cent. of the irrigation revenue after deducting expenditure. Nothing in this proposal shall be taken to interfere with the rights of private owners to irrigate their own lands.

4. Property Tax.

This tax, which will be 1 ¼ per cent. of the value of the property periodically assessed shall be divided between the Government and the Company upon the following basis:–

(a) The tax derived from all lands lying within 15 miles on either side of such lines of Railway as shall be actually working shall be paid by the Government to the Company.

(b) The tax derived from all lands situated at a distance greater than 15 miles of existent railways shall be retained by the Government.

(c) In the event of the Government deriving any revenue from the territories at present held as Native Reserves other than the hut tax now levied, it
would be fair that the Company should participate in such revenue upon the same principles as above stated.

5. Land Grants in British Protectorate upon Annexation.

(a) In case of annexation of the British Protectorate to the Crown, alternative blocks of land ten square miles in extent along the line shall be granted to the Company.

(b) Grants to be made and the revenue to be derived to be appropriated in a similar manner to that proposed in clause 4.

(c) That the Government shall either make a grant of forest land adequate to the requirements of this Company, if such land is available, or, in the event of a creation of a Forest Department, the Government shall supply to the Company assorted wood to the value of 25 per cent. of the annual revenue derived from the sale of wood.


Mineral rights in the Protectorate upon annexation shall be similar to those granted in British Bechuanaland.

7. Irrigation Works in the Protectorate.

That the powers vested in the Company in respect of irrigation in British Bechuanaland shall be extended to the Company in case of the annexation of the Protectorate and the region within the sphere of British influence beyond the Protectorate to the Crown.

These Protectorate clauses to be understood to be valid only with the consent of the Chiefs, and not to interfere with rights legally acquired previous to the date of annexation.

In consideration of the grant of the above concessions the Company is prepared to undertake the construction of the Railway through British Bechuanaland starting from its southern border and proceeding, via Mafeking, through Bechuanaland thus:

(1) That the Railway shall be of the same gauge and similarly constructed as the Cape Railways.

(2) The tariff to be based upon the present Colonial rates.

(3) In case of annexation of British Bechuanaland to the Cape Colony, the Cape Government to have the right to take over the Railway at a valuation / to be fixed by arbitration, such valuation to amount to at least the original cost with 10 per cent. added thereon.
As the Railway surveyors purpose leaving by the next mail steamer, your Excellency will confer a great favour upon us if we could receive an early reply to this communication.

I have, &c.,  
(Signed) R. W. MURRAY.

The Right Honourable Sir Hercules G. R. Robinson, P. C., K. C. M. G.,  
Governor of the Colony of the Cape of Good Hope and  
Her Majesty’s High Commissioner, &c., &c., &c.

Captain Bower to Mr. Murray.

Government House,  
Cape Town, 5th January, 1889.  
No. 1/j. s.

Sir, – I have the honour to acknowledge the receipt of your letter of the 4th instant, covering, for the consideration of the High Commissioner, a draft of amended proposals for the construction of a Railway through British Bechuanaland, upon which I am directed by His Excellency to make the following remarks.

2. The amended proposals contain no information whatever on the points specified in His Excellency’s observations to the Secretary of State upon your former proposals as of primary importance, namely, the estimated length, cost, and working expenses of the Railway proposed to be constructed, together with the probable receipts and consequent deficiency to be made good.

3. His Excellency can therefore, at present, do no more than point out the parts of your proposals which he would not be able to recommend Her Majesty’s Government to assent to. They are proposals 5, 6 and 7, as well as, so far as he can at present understand them, sub-sections (b) and (c) of proposal 4.

4. Before expressing any opinion on the remaining proposals 1, 2, 3 and 4 (a) the High Commissioner would have to transmit them to Sir Sidney Sheppard, so as to learn his views upon them.

5. A consideration of the remaining proposals would, however, be much facilitated by more precise information on the following points:—

6. As to 1, ‘Land Grants.’ What is the precise meaning of the word ‘available’? Is it meant that the whole of the Crown lands in the Maritsani District, surveyed and unsurveyed, whether they be more or less than 220,000 acres, shall be given to the Company. Are the 1,000 square miles in the neighbourhood of Genesa to be in one block? Is the ‘anticipation that the Government will not be disinclined to increase the area’ specified, if the Company desire it, intended to imply any obligation or promise on the part of the Government to comply with such a desire if it should be advanced at any future time? What is the precise
meaning of the words ‘excluding the fiscal provisions.’ Does it exclude only the usual redeemable and irredeemable quitrent of 10s. per 100 morgen, or does it include also survey charges and transfer fees?

7. As to 2, ‘Mineral Rights.’ Is the choice of the alternatives proposed, namely, half of the net revenue, or one-sixth of the gross revenue, to rest with the Government or the Company?

8. With reference to 3, ‘Irrigation.’ Are the words ‘all lands in British Bechuanaland’ intended to include Native Reserves and Crown lands? Is it intended that the irrigation rate shall be levied ‘on all property irrigated and capable of being irrigated,’ whether the owners desire water or not, or whether they have irrigated their own lands or not? Does the ‘one per cent. of the irrigation revenue after deducting expenditure,’ which the Government is to receive, mean one per cent. of the net profits only, if any, and on whom is the duty and expense of levying the irrigation rates throughout the whole of British Bechuanaland to devolve?

9. As to 4, ‘Property Tax’ (a). Is it intended that the words ‘all lands lying within 15 miles on either side’ of the Railway should include Crown lands and Native Reserves? By whom and at whose cost and risk is the property tax to be collected?

10. Without explicit information on the points I have thus specified, it seems impossible to advance a single step in the consideration of the four remaining proposals to which I have referred.

11. His Excellency observes that, in consideration of the promise of future concessions in the Protectorate and sphere of influence in the event of annexation, the Company only undertakes the construction of the Railway through British Bechuanaland, and not through the territories in respect of which promised concessions are asked for, but this point is not material, as a promise of concessions in the Protectorate and sphere of influence cannot be recommended.

I have, &c.,
(Signed) GRAHAM BOWER,
Imperial Secretary.

R. W. Murray, Esq., Cape Town.

Mr. Murray to Captain Bower.

Cape Town,
7th January, 1889.
No. 1/35.
Sir, – I have the honour to acknowledge the receipt of your letter of the 5th inst., received this morning, and in reply to lay the following information before His Excellency.
Referring to paragraph 2,

With regard to the estimated length and cost and working expenses of the Railway proposed to be constructed in British Bechuanaland, I have to state that the length is between 160 and 170 miles, the exact terminus not having been yet settled; the cost of which, taken at £7,000 per mile, will be £1,190,000 for 170 miles. The working expenses it is impossible at present to estimate, but they will average probably between £50,000 and £80,000 per annum, depending largely on the amount of traffic.

As to the amount of traffic it is impossible for any one to give an estimate.

As to Land Grants.

I may say that the proposal includes all the Crown lands in the Maritsani District, both surveyed and unsurveyed, and the figures given were furnished by the Department of the Surveyor-General of Bechuanaland as representing all the available Crown lands in that district, and it is proposed that they shall be given to the Company.

It is proposed that the 1,000 square miles in the neighbourhood of Genesa shall be in one block.

The paragraph respecting the increased area was intended to mean that if, hereafter, branch railways shall be made, and there are then available Crown lands, that the Government will not object to subsidize such branch lines with land grants, as in the case of the main trunk lines. / The words, 'excluding the fiscal provisions,' are intended to convey the following meaning, namely, that the lands shall be transferred free to the Company, and held by them free of quitrent; that there will be no survey charges, inasmuch as the lands will be surveyed by the Company at their own cost, but that the transfer fees will be paid by subsequent purchasers from the Company to the Government.

Mineral Rights.

The proposal was put in an alternative form for the choice of the Government, the second alternative being inserted with the idea of avoiding the investigation of the Government books.

Irrigation Works.

It is not intended to interfere with the rights of Crown lands or Native Reserves or private property in cases where the owners do not request the irrigation by the Company.
The 1 per cent. of the irrigation revenue means 1 per cent. of the net profits only, and the duty and expense of levying the irrigation rates will be carried out and borne by the Company.

Property Tax.

Clause (c) shows that it was intended Native Reserves should not be included. The Railway goes through no Crown lands except those which it is proposed should be given to the Company. The property tax it is expected will be collected by the Government.

Protectorate Clauses.

With regard to Clause 11, I beg to call the attention of His Excellency to the words in the clause of section 5, ‘alternative blocks of land ten square miles in extent along the line shall be granted to the Company.’

The Laying out of Townships.

I regret to find that I omitted in my letter of the 4th of January instant a reference to proposals in my letter dated at Vryburg on the 16th October last, with respect to the laying out of townships. I understand that there will be no objection to the right of our laying out townships on lands acquired by us, and in the event of stations occurring on Native Reserves a plot of land not exceeding 8 morgen shall be granted to the Company free for station purposes.

In conclusion, I anticipate that it is hardly necessary to say it is understood that the rights retained by Government under the land titles of British Bechuanaland for the construction of railways will, for the construction of this Railway, be extended to the Company which I represent.

I have, &c.,

(Signed) R. W. MURRAY.

Captain Graham Bower, R. M., C. M. G.,
Imperial Secretary.

Captain Bower to Mr. Murray.

Government House,
Cape Town, 8th January, 1889.

Sir, – I have the honour to acknowledge the receipt of your letter of the 7th instant, supplying information on the points specified in my letter of the 5th instant. Your explanations enable the High Commissioner to understand more precisely the nature of the concessions which your Company / require from the Government of British Bechuanaland for the construction of a Railway through
that territory, and upon this part of your proposal His Excellency only thinks it necessary, therefore, to make at present a few further remarks.

2. His Excellency thinks it desirable to add to the parts of your proposal, which, as already explained, he would not be able to recommend Her Majesty’s Government to assent to, the passage under the head of land grants referring to the subsidizing of possible future Branch Railways.

3. With reference to your explanation as to survey charges, the High Commissioner assumes that any expenses already incurred for the survey of the 150,000 acres, and any that may hereafter be necessarily incurred by the Government upon the 70,000 acres and the 1,000 square miles, so as to enable the Surveyor-General to assume the responsibility of issuing Crown titles or transfers for these lands, will be paid by the Company.

4. His Excellency presumes, also, that the Company will pay for any injury to improvements on lands taken for the line or for station purposes in the Native Reserves, in the same manner as they would have to pay under the land titles of British Bechuanaland for injury to improvements on private lands expropriated for the same purposes.

5. With reference to the obligations which the Company on their part are prepared to undertake, His Excellency would be glad to receive such information as you can supply on the following points:—

(a) Are the Company prepared to undertake the construction of a Railway through British Bechuanaland, whether the Cape Government extends its line to the border immediately or not?

(b) If so, in what time after the execution of a formal agreement will the work be commenced, and within what period will it be completed?

(c) What security will be given by the Company for the due fulfilment of their part of the contract?

(d) It is understood that the property tax will be leviable on lands (other than Native Reserves and Crown Lands and Crown Reserves) lying within fifteen miles on either side of the Railway, as soon as each section of the line is actually working; but is it proposed that the advantages of land grants, mineral rights, and irrigation rates are to be deferred till the completion of the Railway to Mafeking? If not, when do the Company propose that they should be allowed to avail themselves of these concessions?

(e) If the railway should be taken over by the Colonial Government at a valuation, is it intended that the minimum of such valuation shall be the original cost plus 10 per cent., exclusive of any sums which the Company may have realised from the concessions, and would what remained of such concessions be then surrendered?

(f) What minimum of train accommodation, per day or week, would the Company guarantee to supply?
6. When information has been furnished on these points the High Commissioner thinks it would be convenient if you were to submit amended proposals, embodying the explanations furnished in the correspondence, and His Excellency would then lose no time in forwarding such proposals to the Administrator for his report and to Ministers for their information, as directed by the Secretary of State.

I have, &c.,
(Signed) GRAHAM BOWER,
Imperial Secretary.

R. W. Murray, Esq., Cape Town. / 

Mr. Murray to Captain Bower.

Copy.

Cape Town, 9th January, 1889.
No. 6/J. S./M.

Sir, – I have the honour to acknowledge the receipt of your communication of the 8th instant, and in reply thereto I beg to state as follows:–

Branch Railways.
I am prepared to strike out the passage under the head of land grants (2) referring to the subsidizing of future branch railways.

Survey Expenses (3).
The Company will agree to pay the expenses which have been incurred and which may be necessary in the future for surveys by the Government.

Compensation (4)
The Company will pay for any injury to improvements on lands taken for the line or for station purposes in the Native Reserves.

Construction of the Railway.
As to clause 5 sub-section (a) of your communication, the Company is prepared to undertake the construction of a line through British Bechuanaland, whether the Cape Government extends its line to the border immediately or not.

Time in Construction (5).
As to clause (b), the success of the Railway being in the first instance dependent on the speed of its construction, there is no reason to doubt that every effort will be made to construct the Railway as quickly as possible, inasmuch as some of the
concessions will not come into operation until the line is working. This should be a sufficient guarantee that the work will be prosecuted with vigour. Provided there are no delays by shipwreck or other causes in the conveyance of material, the line will reach Mafeking within three years of the formal grant.

Security (3)

The Company has already proved to the satisfaction of the Secretary of State for the Colonies that it is composed of respectable people, and the usual guarantee will be given by these gentlemen for the due fulfilment of the contract.

This may be safely left for the decision of the Secretary of State for the Colonies, inasmuch as the final contract must be signed in London.

Property Tax.

This tax, as previously explained, is not to come into operation until the Railway is working, and this tax will only be levied on the areas through which the Railway is actually working.

Mineral Rights.

The conditions respecting mineral rights shall come into force upon the signing of the contract between the British Government and the Bechuanaland Exploring Company for the construction of the Railway, which construction will be guaranteed in the manner before stated.

Land Grants and Irrigation Rights.

These, it is proposed, shall be given to the Company on the execution of their formal agreement with the Government, in order that the Company may at once take steps to develop the country. It would perhaps be as well to define the land grants as in the Mafeking and Maritsani Districts, including all available lands near the eastern frontier, such as Rooi Grond erven and commonage.

If more detailed information is necessary, the Surveyor-General of British Bechuanaland, who is at present in Cape Town would provide His Excellency with such information.

Taking over the Railway.

It is intended that the minimum of valuation shall be the original cost, plus 10 per cent., exclusive of any sums which the Company may have realised from the concessions, and the remainder of such concessions would be surrendered to the Colonial Government, excepting such lands as may have been brought under irrigation works, subject to compensation for all monies spent in irrigation works or land improvements.
Train Traffic.

The trains, of course, would so largely depend upon the amount of traffic that it is almost impossible to fix what the number of trains would be. At the same time a guarantee may be given of a minimum of not less than six per week.

If these answers meet with the approval of His Excellency I shall immediately be prepared to formulate the amended proposals as suggested.

I have, &c.,

(Signed) R. W. MURRAY.

Captain Graham Bower, R. N., C. M. G.,
Imperial Secretary.

Imperial Secretary to Mr. Murray.

Copy.

Government House,
Cape Town, 11th January, 1889.

Sir, – I have the honour to acknowledge the receipt of your letter of the 9th instant, and in reply to observe that, taking this letter in conjunction with your previous letters of the 5th and 7th instants, His Excellency the High Commissioner understands that the proposals for the construction of a Railway through British Bechuanaland which you now submit for the consideration of the Government are as follows:—

The Bechuanaland Exploring Company undertakes, for the consideration hereinafter specified, to construct a Railway through British Bechuanaland, starting from its southern border and proceeding to the neighbourhood of Mafeking via Taungs and Vryburg.

The Railway to be of the same gauge and similarly constructed as the Cape Railways.

The length will be between 160 and 170 miles, the exact terminus not having been yet settled.

The cost, taken at £7,000 a mile, would be £1,190,000 for 170 miles.

The working expenses it is impossible at present to estimate, but they will probably average between £50,000 and £80,000 per annum, depending largely on the amount of traffic.

The tariff to be based upon the present Cape Colony rates, but it is impossible at present for any one to give an estimate as to the probable amount of receipts.

The number of trains would depend largely upon the amount of traffic, but the Company would guarantee a minimum of not less than six a week, being three each way.
The work will be prosecuted with vigour, and, provided there are no delays by shipwreck or other unavoidable causes in the conveyance of material, the Company will undertake that the line shall reach Mafeking and be open for traffic within three years of the formal signing of the agreement.

The Company is prepared to construct the line through British Bechuanaland, whether the Cape Government extends its line to the border immediately or not.

The security to be given by the Company for the due fulfillment of their contract to be left for the decision of the Secretary of State for the Colonies, as the final agreement will have to be signed in London.

The Colony of British Bechuanaland, in return for the Railway, to make to the Company the following concessions:

The land required for the line and sidings and stations to be given to the Company, the Company paying for any injury to improvements on land so taken from private proprietors and in the Native Reserves.

The Crown lands available for sale in the Maritsani and Mafeking districts, and estimated at about 150,000 acres surveyed and 70,000 acres unsurveyed, to be given to the Company; also a block of 1,000 square miles in the neighbourhood of Genesa.

The land grants to be in the form of the present quitrent tenure of British Bechuanaland, but the lands to be held by the Company free of quitrent.

The Company to pay any expenses which have been incurred and which may in the future be necessarily incurred for the survey of these lands by the Government. Transfer fees will be paid to the Government by future purchasers from the Company.

The Company shall share with the Government half the revenue derived from the discovery of precious minerals and precious stones after deducting the costs of local administration, or it shall receive 33 per cent. of the gross revenue accruing to Government, which would be equivalent to one-third of the half of the gross revenue.

The choice of the alternatives proposed, namely, half the net revenue or one-sixth of the gross revenue to rest with the Government.

The Company shall be empowered to promote the irrigation of all lands in British Bechuanaland other than Crown lands and Native Reserves by artificial and other means for the supply and storage of water.

The Company shall have the right to levy rates, to be called irrigation rates, upon all property irrigated and capable of being irrigated, regard being had to the value to be derived by the owners of property from irrigation works. The assessment of rates to be regulated by a Board, consisting of a nominee of the Government, a nominee of the Company, and a local representative. Such rates shall not be levied until the Company is prepared to place the water on the land.
Nothing in this proposal to be taken to interfere with the rights of private owners to irrigate their own lands, or with the rights of owners who do not desire the irrigation by the Company.

The Government to receive one per cent. of the irrigation revenue after deducting expenditure (that is one per cent. of the net profits), and the duty and expense of levying irrigation rates will be carried out and borne by the Company.

A property tax of 1 ¼ per cent. on the value of all lands other than Crown lands, Crown Reserves and Native Reserves, lying within 15 miles on either side of such line of Railway as shall be actually working shall be collected by the Government and paid to the Company.

The value of the lands to be periodically assessed.

The Company, having given such security for the due fulfilment of its contract as may be decided on by the Secretary of State, it is proposed that the conditions specified as regards land grants, mineral rights, and irrigation rights shall come into operation on the signing of the contract between the British Government and the Bechuanaland Exploring Company. / In case of annexation of British Bechuanaland by the Cape Colony, the Cape Government to have the right to take over the Railway at a valuation to be fixed by arbitration, such valuation to amount to at least the original cost with 10 per cent. added thereon.

No abatement to be made for any sums which the Company may, before the time of transfer, have realized from the concessions; but the remainder of the concessions would be surrendered to the Colonial Government, excepting such lands as may have been brought under irrigation works, such would be subject to compensation for all monies spent in irrigation works or land improvements.

If the foregoing correctly represents your proposals as they may stand, His Excellency will be glad if you will furnish me with three signed copies, one for this office and the others for transmission to His Honour the Administrator for his report and to Ministers for their information.

I have, &c.,
(Signed) GRAHAM BOWER,
Imperial Secretary.

R. W. Murray, Esq., Cape Town.

Mr. Murray to Captain Bower.

Cape Town, 12th January, 1889.

Sir, – I have the honour to acknowledge the receipt of your letter of the 11th instant, and to forward herewith the amended proposals for the construction of the Bechuanaland Railway. You will observe that I have, in accord with an interview, made provision for the compensation to owners of town erven in case
the Railway should proceed over such, and have also provided that the local
Government of British Bechuanaland shall hold the same rights as the Cape
Government would do in case of the annexation of British Bechuanaland to the
Cape Colony, and the Colony was desirous of taking over the railway.

I forward three signed copies at your request.

I have, &c.,

(Signed) R. W. MURRAY.

Captain Graham Bower, R. N., C. M. G.,
Imperial Secretary.

Proposals for the construction of the British
Bechuanaland Railway, made by the Exploring Company,
Limited, to His Excellency the Right Honourable
Sir Hercules George Robert Robinson, P.C., G.C.M.G.,
Governor of the Colony of the Cape of Good Hope, and
Her Majesty’s High Commissioner, &c., &c., &c.

The Bechuanaland Exploring Company undertakes, for the considerations here-
inafter specified, to construct a Railway through British Bechuanaland, starting
from its Southern Border and proceeding to the neighbourhood of Mafeking via
Taungs and Vryburg.

The Railway to be of the same gauge and similarly constructed as the Cape
Railways.

The length will be between 160 and 170 miles, the exact terminus not having
been yet settled.

The cost, taken at £7,000 per mile, would be £1,190,000 for 170 miles.

The working expenses it is impossible at present to estimate, but they will
probably average between £50,000 and £80,000 per annum, depending largely
on the amount of traffic.

The tariff to be based upon the present Cape Colony rates, but it is impos-
sible at present for any one to give an estimate as to the probable amount of
receipts. /

The number of trains would depend largely upon the amount of traffic, but
the company would guarantee a minimum of not less than six a week, being
three each way.

The work was prosecuted with vigour, and, provided there are no delays by
shipwreck or other unavoidable causes in the conveyance of material, the Com-
pany will undertake that the line shall reach Mafeking and be open for traffic
within three years of the formal signing of the agreement.
The Company is prepared to construct a line through British Bechuanaland, whether the Cape Government extend its line to the border immediately or not.

The security to be given by the Company for the due fulfilment of their contract to be left for the decision of the Secretary of State for the Colonies, as the final agreement will have to be signed in London.

The Colony of British Bechuanaland, in return for the Railway, to make the Company the following concessions:—

Land. – The land required for the line and sidings and stations to be given to the Company, the Company paying for any injury to improvements on land so taken from private proprietors and in the Native Reserves.

The Crown lands available for sale in the Maritsani and Mafeking districts, and estimated at about 150,000 acres surveyed and 70,000 acres unsurveyed, to be given to the Company; also a block of 1,000 square miles in the neighbourhood of Genesa.

The land grants to be in the form of the present quitrent tenure of British Bechuanaland, but the lands to be held by the company free of quitrent.

The Company to pay any expenses which have been incurred and which may in the future be necessarily incurred for the survey of these lands by the Government.

Transfer fees will be paid to the Government by subsequent purchasers from the Company.

In case of the Railway passing over town or village erven, the owners to be compensated, and the amount of compensation to be settled by arbitration.

Minerals. – The Company shall share with the Government half the revenue derived from the discovery of precious minerals and precious stones after deducting the costs of local administration, or it shall receive 33 per cent. of the gross revenue accruing to Government, which would be equivalent to one-third of the half of the gross revenue.

The choice of the alternatives proposed, namely, half the net revenue or one-sixth of the gross revenue to rest with the Government.

Irrigation. – The Company shall be empowered to promote the irrigation of all lands in British Bechuanaland, other than Crown lands and Native Reserves, by artificial and other means for the supply and storage of water. The Company shall have the right to levy rates to be called irrigation rates upon all property irrigated and capable of being irrigated, regard being had to the value to be derived by the owners of property from irrigation works.

The assessment of rates to be regulated by a Board, consisting of a nominee of the Government, a nominee of the Company, and a local representative. Such rates shall not be levied until the Company is prepared to place the water on the
land. Nothing in this proposal to be taken to interfere with the rights of private owners to irrigate their own lands, or with the rights of owners who do not desire the irrigation by the Company.

The Government to receive one per cent. of the irrigation revenue after deducting expenditure (i.e., one per cent. of the net profits) and the duty and expense of levying the irrigation rates will be carried out and borne by the Company.

Property Tax. – A property tax of 1 ¼ per cent. on the value of all lands other than Crown lands, Crown Reserves and Native Reserves lying within fifteen miles on either side of such line of Railway as shall be actually working shall be collected by the Government and paid to the Company. / The value of the lands to be periodically assessed.

The Company having given such security for the due fulfilment of its contract as may be decided on by the Secretary of State, it is proposed that the conditions specified as regards land grants, mineral rights, and irrigation rights shall come into operation on the signing of the contract between the British Government and the Bechuanaland Exploring Company.

In case of annexation of British Bechuanaland by the Cape Colony, the Cape Government to have the right to take over the Railway at a valuation to be fixed by arbitration, such valuation to amount to at least the original cost with ten per cent. added thereon.

No abatement to be made for any sums which the Company may before the time of transfer have realized from the concessions, but the remainder of such concessions would be surrendered to the Colonial Government, excepting such lands as may have been brought under irrigation works, which would be subject to compensation for all monies spent in irrigation works or land improvements.

These conditions will equally apply to the Bechuanaland Government in the event of their wishing to take over the Railway.

(Signed) R. W. MURRAY.
Sir H. Robinson to Lord Knutsford.

Copy.

Government House, Cape Town, 6th February, 1889.

South Africa, No. 103.

My Lord, — With reference to my despatch No. 34 of the 12th ultimo, I have the honour to enclose for your Lordship’s information copies of further correspondence which I have had with Mr. R. W. Murray respecting the proposed terms of a railway concession in British Bechuanaland.

I have, &c.,

(Signed) HERCULES ROBINSON,
Governor and High Commissioner.

The Right Honourable Lord Knutsford,
G. C. M. G., &c., &c., &c.,
Colonial Office.

Mr. Murray to Captain Bower.

Copy.

Cape Town, 12th January, 1889.

Sir, — I have the honour to suggest, so as to prevent any misunderstanding on the point (in continuation of my correspondence of this day’s date) with regard to the expropriation of land in connection with the Bechuanaland Railway and the rights to be granted to the Company which I represent, and I take it to be clearly understood that the Rooi Grond Commonage would come under the term ‘available land,’ that is to say, that, in the event of the acquiring of the land held by the present erfholders, the entire commonage will then become the property of the Company, subject to the same conditions on which all land will be conveyed to them under the agreement, and, in order that they should become possessed of the erven aforesaid, that the Government will cede to the Company the right which it possesses of re-acquiring the property under the quitrent titles of the erfholders.

I have, &c.,

(Signed) R. W. MURRAY.

Captain Graham Bower, R. N., C. M. G.,
Imperial Secretary.
Captain Bower to Mr. Murray.

Copy.

Government House,
Cape Town, 16th January, 1889.
J. S./12m.

Sir, — I am directed by His Excellency the High Commissioner to acknowledge the receipt of your letter of the 12th instant, enquiring whether the Rooi Groud Commonage would come under the term available land if your Company were to acquire all the rights of the existing erfholders, and whether the Government would cede to the Company the right of expropriation in order that they might become possessed of the erven.

In reply I am directed to say that the expropriation right reserved to Government could not properly be ceded to a private Company, nor could it be used in the manner suggested, but if the Company were to acquire, by purchase or otherwise, the rights of all existing erfholders, the Rooi Groud Commonage could be held to come under the term available land.

I have, &c.,
(Signed) GRAHAM BOWER,
Imperial Secretary.

R. W. Murray, Esq.,
Cape Town.

Mr. Murray to Captain Bower.

Copy.

Cape Town,
17th January, 1889.

Sir, — I have the honour to acknowledge the receipt of your letter of yesterday’s date, and I beg to say that it was my intention to convey that if the Company were to acquire, by purchase or otherwise, the rights of all existing erfholders, the Rooi Groud Commonage could be held to come under the term ‘available lands.’

I have, &c.,
(Signed) R. W. MURRAY.
Captain Graham Bower, R. N., C. M. G.,
Imperial Secretary.
Sir H. Robinson to Lord Knutsford.

Copy.

Government House,
Cape Town, 27th February, 1889.
South Africa,
No. 148.

My Lord, — In continuation of my despatches Nos. 34 and 103 of the 12th January and 6th February, I have now the honour to forward copies of Minutes by the Administrator and Surveyor-General of British Bechuanaland upon the amended proposals submitted by Mr. R. W. Murray on behalf of the Bechuanaland Exploring Company for the construction of a Railway through that territory.

2. Mr. Murray, in return for a Railway to be made and worked by his Company, asks for the following concessions from the Government:—

(1) Land grants;
(2) A share of any future revenue from minerals and precious stones;
(3) Irrigation rights; and
(4) A property tax.

3. As regards (1) Land grants, Mr. Duncan, the Surveyor-General, points out that the capitalised value of the total extent of land asked for is only at the current prices £41,700, which is equivalent to an annual quitrent revenue of £2,085. Sir Sidney Shippard considers that this concession might be granted, and I concur with him in this view.

4. With reference to (2) a share of any future receipts from the discovery of precious minerals and precious stones in British Bechuanaland, Mr. Murray asks for one-half of the net revenue, or one-sixth of the gross revenue, which may hereafter be derived from this source. Sir Sidney Shippard observes he is so sure of the enormous value of the mineral resources of the territory that he regards this concession alone as far more than an equivalent for the construction of the proposed Railway. He thinks it would be better for the Government to make the Railway, retaining the Crown lands and mineral rights asked for by the Company; but, if this cannot be effected, he would, for the sake of securing the speedy construction of a Railway through British Bechuanaland, which he considers an object of primary importance, even go so far as to agree to what he describes the ‘exorbitant terms’ which the Company demand under this head.

5. I cannot altogether concur with Sir Sidney Shippard as to the unreasonable character of this demand. I do not think there is the least chance of a railway through British Bechuanaland paying interest on construction, or working expenses, except under one or other of two doubtful contingencies, namely, either the discovery of payable gold-fields or reefs in British Bechua-
naland or the discovery of rich alluvial gold-fields in the Protectorate or the sphere of influence beyond it, which would be approachable only through British Bechuanaland. As to the first contingency, I am not aware of any grounds whatever for the certainty expressed by Sir Sidney Shippard as to the enormous value of the mineral resources of British Bechuanaland. If this were so I should assuredly say it would be unwise to give any concessions at all for constructing a railway, as it could, in such case, before long be made without them. As to the second contingency, there is no doubt grounds for thinking that Mashonaland will prove a rich alluvial gold-field, but to what civilized power that country will eventually belong and whether it will be approached through British Bechuanaland, the Transvaal, Portuguese territory, or by the Zambesi, are still open questions.

6. The Railway, therefore, at present is purely a speculative undertaking. I concur with Sir Sidney Shippard that the cheapest course would be for the Government to make it; but, if Her Majesty’s Government are not prepared to incur such a risk, and desire the immediate prosecution of the work, it seems to me only reasonable that the Company, which is willing to undertake such a serious risk, should have also the chances of gain.

I do not object, therefore, to the mineral concession asked for.

7. As to (3) the irrigation proposals, it is not very clear what the Company require; but, if they seek for a monopoly of waterworks throughout British Bechuanaland, it would be necessary, for the protection of the public, to embody in the concession, as suggested by Mr. Duncan, the provisions of the Cape Irrigation Act, No.8 of 1877, with certain modifications.

8. As regards (4) the proposal for a property tax, Sir Sidney Shippard is entirely opposed to it, unless a Legislative Council with representation in some shape be first established. I think Sir Sidney Shippard exaggerates the magnitude of the proposal and the difficulties in the way of giving effect to it.

Mr. Duncan, in his Minute, points out that the total present value of the property within 15 miles of the Railway which would be subject to the proposed tax is £128,900, and that the annual payment on this at 1 ¼ per cent. would only amount to £1,611. I think the property tax, which should more / correctly be described as a railway rate, might be collected without additional expense with the Government quitrents, and that the assent of the whole, or at all events of the great majority, of the owners of property within 15 miles of the Railway might easily be secured beforehand to such a tax.

9. With reference to the conditions on which the Government can take over the Railway from the Company if it desires to do so, I think those proposed by Mr. Murray are preferable to those suggested by Sir Sidney Shippard. The chief objection that I see to the making of a railway at all through British
Bechuanaland by a Company in return for concessions such as those asked for, is that such a scheme would interpose many obstacles in the way of the acceptance by the Cape of the Crown Colony if, as I think likely, Her Majesty’s Government and the British public should before many years be anxious for such a transfer. Sir Sidney Shippard’s suggested conditions would render annexation by the Cape almost impracticable for 20 years.

10. On the whole, I am disposed to think it would be better not to move further in this matter at present. The South African Republic, with its extravagant and embarrassing concession to the Netherlands Company, is an example of what can be lost in a similar undertaking by impatience; whilst the Orange Free State, which can now get its railways made without cost or risk, is an example of what can be gained by waiting. If, however, Her Majesty’s Government desire the immediate construction of a railway through British Bechuanaland, and are not prepared themselves to incur the risk of such an undertaking, I should recommend the acceptance of Mr. Murray’s proposals, which, under all the Circumstances of the case at the present moment, are, I think, far from unreasonable.

11. I must, however, point out that Mr. Murray has not supplied me with any information whatever as to the personnel of the Bechuanaland Exploring Company, and has stipulated that ‘the security to be given by the Company for the due fulfilment of their contract is to be left for the decision of the Secretary of State for the Colonies.’

If your Lordship is satisfied on these points, and thinks it desirable to proceed further in the matter, the present proposals can, of course, only be looked on as a skeleton of the final agreement, which would have to be most carefully drafted by legal and railway professional experts.

I have, &c.,
(Signed) HERCULES ROBINSON,
Governor and High Commissioner.

The Right Honourable Lord Knutsford,
G. C. M. G., &c., &c., &c.,
Colonial Office.

**Minute on Proposals by the Bechuanaland Exploring Company, Limited, for the Construction of a Railway through British Bechuanaland.**

(1). The estimate of cost, viz., £7,000 per mile, appears to me exceedingly high for a 3-ft. 6-in. gauge in a country which may be fairly described as a dead level from end to end. I have been assured by persons, whom I believe to be
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competent to estimate the cost, that a railway on the Cape gauge could be constructed through British Bechuanaland for £5,000 a mile, inclusive of rolling stock, and that this rate would leave a handsome margin of profit.

(2). The estimate of working expenses appears also excessive. I have reason to believe that from the outset the traffic would be very large, as the Bechuanaland Railway would command the easiest approaches to the Transvaal Gold-fields.

(3). The question of tariff and the conditions requisite for the protection of the interests of the public and of the Government will, I presume, receive due attention before terms are finally agreed on. In view of future contingencies it would, I think, be desirable to adhere as closely as possible to the conditions imposed by the Cape Legislature when authorising the construction of railways by any Company or individual. (cf. The Cape Central Railway Act, No. 16, 1883; The Cape Central Railways Extension Act, No. 32, 188; The Graham’s Town and Port Alfred Railway Act, No. 5 1881; The Point and Sea Point Railway Company’s Act, No. 31, 1884; The Imvae and Indwe Railway and Coal Mines Act, No. 3, 1882; and The Imvae and Indwe Railway and Coal Mines Act, No. 11, 1886).

With regard to the concessions asked for,

(4). I am of opinion that the proposals of the Company with respect to land grants may be accepted.

(5). For the sake of securing the speedy construction of a railway through Bechuanaland – an object of primary importance – I would even go so far as to agree to the exorbitant terms which the Company demand with regard to the revenue hereafter to be derived from the discovery of precious minerals and precious stones in British Bechuanaland. I am so sure of the enormous value of the mineral resources of this territory that I regard this concession alone as far more than an equivalent for the construction of the proposed Railway. It would be far cheaper and more advantageous for this Government to make the Railway departmentally and retain both the Crown lands and the full mineral rights at present secured by law; unless, indeed, the territory be soon annexed to the Cape Colony.

(6). The proposals with regard to irrigation appear to me somewhat obscure. I do not clearly understand whether the Company demand a monopoly of waterworks throughout the territory or not. If they do, it might become necessary to protect the public against the evils of what might prove to be a most vexatious and oppressive monopoly.

If the Company do not seek a monopoly, the law already gives them all powers necessary to enable them to carry out irrigation works and convey water from or over any land belonging to or in the occupation of any person. The Right of Passage or Water Act, No. 26, 1882, is in force in this territory, and gives ample powers of this kind.
The Irrigation Act, No. 8, 1877 (as amended by the Irrigation Act Amendment Act, No. 7, 1880) and the Municipalities Irrigation Works Loan Act, No. 28, 1879, can hardly be considered as in all respects applicable to the present circumstances of this territory.

As I suppose that a proposal of a Government guarantee to cover the amount of revenue which the Company might reasonably expect to derive from irrigation works would not be entertained, I would somewhat reluctantly concede the demands of the Company with regard to irrigation, provided that due precautions be taken to protect the public against the evils of a monopoly, and provided further that the Company undertake to conform to the terms of the Cape Irrigation Act, No. 8, 1877, so far as applicable.

(7). To the proposal of a 'Property Tax' I am opposed on principle, because I regard any attempt to impose on Europeans direct taxation without representation as a dangerous if not fatal error. To that error England owed the irreparable loss of the American Colonies. Again, it was Sir Owen Lanyon's ill advised attempt to levy the direct railway tax, originally imposed by President Burgers, which was the immediate cause of the rising of the Transvaal Boers and of the loss to the Empire of one of the richest countries in the world. It is true that in the present case, as the Surveyor-General points out, the proposed tax would fall almost entirely on the hitherto untaxed Dutch farmers of Stellaland and their assigns, who he says ought to be taxed, but this circumstance does not affect my conclusions.

If it be decided, contrary to my advice, to impose a direct property tax in this territory for the benefit of a Company of shareholders in England, I can only express a hope that a Legislative Council, with some sort of representative element, will be established before any attempt be made to levy such a tax, which, in my opinion, ought at the very least to have the approval of a majority of the elected members. Even then a tender of payment in lead, followed by coercion, might necessitate an expenditure more than sufficient for the construction of the Bechuanaland Railway.

(8). With regard to the proposed conditions of purchase of the Railway by Government, I object to the proviso that the valuation to be fixed by arbitration must amount to at least the original cost, with ten per cent. added thereon.

I think that on this point the provisions of the Cape law should be adhered to, viz., that the Government should have a right to purchase the Railway after twenty years, upon such terms as may be mutually agreed upon between the Company and the Colonial Government, and, failing such agreement, at a price to be settled by arbitration.

(Signed) SIDNEY SHIPPARD,
Administrator.

Vryburg, 12th February, 1889.
Land Grants. – This proposal may be stated as follows:–

150,000 acres surveyed.
70,000 ” unsurveyed.
220,000 ” or 104,762 morgen.
1,000 square miles or 302,000 ”
406,762 morgen.

Or in round numbers 407,000 morgen.

At current prices the capitalized value of this farm land to the Government, when sold, would be £40,700. Add to this, say, £1,000, the value of the Rooi Grand and Mafeking erven available, and the total land grant would be worth £41,700, or, at 5 per cent., an annual revenue of £2,085.

Of the farm land applied for, that surveyed and about 130,000 acres, of the Genesa block would be taken up in the course of a few months. The remainder would, in all probability, not be sold by the Government for two years or more. The prospective immediate loss to the revenue would therefore be, assuming the erven to be immediately saleable, about £700 per annum.

The erven in the township of Mafeking already granted are held upon free-hold tenure, and it may be thought desirable to adhere to such tenure when granting to the Railway Company such Mafeking township erven as may be available for this purpose.

In the final agreement the breadth of the land ‘required for the line and sidings and stations’ must be stated.

Mineral Rights. – The money paid to the Railway Company would be derived from the following sources:–

1. Claim licences, Sections 27 and 35.
2. Certificates of hypothecation of claims, Section 29.
3. Certificates of transfer of claims, Section 30.
4. Certificates of reservation, Section 33.
5. Royalties on mining leases, Section 36 (b).
6. Certificates of liens against claims, Section 56.
7. Royalties, Section 65.

The expenditure on local administration would embrace:–

1. Salaries and allowances of mining commissioners, inspectors, registrars, and other officers, and persons appointed to perform duties at a digging or mine, and whose salaries and allowances are payable out of the public funds. These would not include civil commissioners, resident magistrates / and staff, post office officials, territorial police, and other persons to whom appointments would be given on a mere increase of population.
2. Expenses of surveys of claims, mining areas, depositing flows, stands, &c., payable by Government, and not recoverable.

3. Expenses of all proceedings under such Lands and Clauses Arbitrations Acts as may be in existence.


5. Payment of share of licences to proprietor of soil.

The revenue and expenditure brought to account under 'Posts' and 'Telegraphs,' 'Administration of Justice,' 'Education,' 'Hospitals,' 'Gaols,' &c., would not be included in the term 'local Administration.'

The impossibility of making an estimate of the revenue to be derived from the discovery of precious minerals and precious stones is of course obvious, inasmuch as the number and richness or such deposits as may be discovered are unknown.

An estimate of the gold-fields' revenue relatively to the total revenue may therefore be of some little value. On reference to the 'Argus Annual,' 1888, p. 119, and comparing the items of 'ordinary revenue' in the Transvaal in the financial years ending March 31st, 1885, before the rush to the gold-fields took place, and March 31st, 1887, when the gold-fields had been attracting people for nine months or so, it will be noticed that the receipt under 'Diggers' Licences,' rose from less than one to nearly twelve per cent. of the total revenue.

During the six months ending September 30th, 1887 the diggers' licences had fallen to ten per cent. of the total revenue.

I am not sure whether any of the receipts under the head 'licences,' and 'special receipts' would include other items of revenue to be included in Mr. Murray's term 'mineral rights.' In all probability some small proportion would be included, and I would therefore place the mineral rights under consideration at, say, fifteen per cent. of the total revenue of the Transvaal.

So far, then, as can be estimated, the mining revenue would be about fifteen per cent. of the total revenue, and, accepting this as the fund out of which, after defraying the costs of local administration, the Railway Company is to obtain a half share, we now proceed to deduct local expenditure.

I have no statistics to show what this proportion would be. A fair assumption would probably be that two-thirds of the gross mining revenue would be expended on local administration. Hence the Government would pay to the Railway Company annually for some years an amount estimated to be 2½ per cent. of the total revenue of the territory.

It must be remembered that the proposed contribution of half the net profits to the Railway Company will be paid out of the revenue derived directly from the mining of precious minerals and precious stones, and will vary with the surplus under this head.
This surplus will not maintain the proportion of five per cent. to the total revenue, for on the discovery of gold a rush takes place and a mining population springs up which demands the necessaries and luxuries of life, the arable lands in the vicinity of the mining centres will be cultivated, the pasturage will be trodden by stock, and local industries will be created. It is therefore probable that, owing to these and other causes, with the progress of the country the revenue derived from mining licences will gradually decrease relatively to the total revenue. In Hayter’s Victorian Year Book for 1884–5 it is shown (statistical summary) that the total population of Victoria in 1850 was 76,162. In 1851 gold was discovered, and the population on the 31st December of that year was 97,489. The value of gold at £4 per oz. raised in 1853 – the highest ever reached – was £12,600,084, and the population in that year was 222,436. In 1856 the amount raised was nearly twelve millions by a population of 397,560, and since that year the value of gold raised has gradually declined, while the population has as gradually increased, until in 1884 gold the value of a little over three million was raised by a population of more than nine hundred thousand. In 1884 the proportion of miners and persons engaged in pursuits subsidiary to mining to the total population was 40,019 to 946,100 (vide paragraph 111), or roughly 4 per cent. In the financial year 1883–4 the revenue from the Victorian Gold-fields was (ibid. para. 901) £20,344, excluding prospecting licences, not included in the proposed agreement, and the total revenue of the Colony for that year was £5,934,687.

It would thus appear that the proposed contribution of half the net mining revenue to the Railway Company is reasonable, and that no term need be agreed upon at the expiration of which such contribution should cease. As to the latter alternative suggested, namely, a payment of one-sixth of the gross mining revenue, I would limit its application to mining areas upon Crown land.

**Irrigation.** – Effect could be given to this proposal by applying, with certain modifications, to British Bechuanaland, Parts 1, 3, 4, 7 and 8 of the Irrigation Act (No. 8) 1887. Instead of Part 2, dealing with the constitution of irrigation boards, a few clauses could be introduced providing for the election of a local representative, and Part 5 could be dispensed with. There would be some difficulty in applying Part 6 to British Bechuanaland under present circumstances, and, on the other hand, it will probably be found that the paragraph in the proposal repudiating interference with the ‘rights of private owners to irrigate their own lands or with the rights of owners who do not desire the irrigation by the Company’ will require to be modified in the sense of the provisions of the Act, prior to insertion in the final agreement.

The paragraph appears, moreover, to be in conflict with that dealing with irrigation rates, which was evidently taken from the forty-fourth section of the Irrigation Act.

It will be observed (Act 8, 77, Section VII) that the consent two-thirds of the landowners within a district is required before such district may be proclaimed
an irrigation district. This would appear to be a sufficient proportion, while a further concession to individuals might seriously affect the working of the scheme, and thereby prevent the majority from enjoying the benefit of a public work of great utility. It will be seen, also, that the provisions of the Act secure full compensation to owners for damage done.

The taxable area under this proposal would be as follows:

<table>
<thead>
<tr>
<th>Division</th>
<th>... ...</th>
<th>130 square miles.</th>
</tr>
</thead>
<tbody>
<tr>
<td>“” Vryburg</td>
<td>... ...</td>
<td>1885 ” ”</td>
</tr>
<tr>
<td>“” Mafeking</td>
<td>... ...</td>
<td>615 ” ”</td>
</tr>
</tbody>
</table>

Total area held in severalty within 15 miles of railway ... 2,630 square miles.

At the current Government upset price for selling land the value of this area would be 2,630 × £30 = £78,900.

To this add the valuation of property in the village of Taung, Vryburg, and Mafeking, approximately £50,000.

The total valuation, therefore, of property subject to this tax at present value would be £128,900, and the annual payment as property tax to the Railway Company until the value increased would be £1,611.

A satisfactory guide for the periodical assessment would no doubt be found in the Divisional Councils Acts.

It is apparent that in the majority of cases the fifteen-mile limit will cut through and not coincide with the boundaries of private properties. As this arrangement might be attended with inconvenience, I would suggest that the local boundaries of the taxable area be subsequently defined on the basis of the fifteen-mile limit. It is obvious that the returns under this tax will steadily increase in amount, and that the term during which this concession is operative should be limited, in order that a legitimate and increasingly important source of public revenue may not be enjoyed by the Company for a longer period than may be considered reasonable in the interests alike of the Company and the State. I would therefore suggest the term of thirty years for this concession. This proposal would appear to ensure the sale of all lands now granted to the Company prior to the purchase of the Railway by the State.

It appears to me to be certain that, if such purchase of the Railway be at any time contemplated, the Company would prefer rather to transfer to private persons the land on receipt of a sum covering the value of the land in addition to the value of the improvements, than to surrender the land to the Government for the value of the improvements only.

Perhaps it would be well to deduct from the purchase price of the Railway the amount realized by the Company from the sale of land or the declared value of the land transferred by it.

(Signed) A. H. F DUNCAN,
Surveyor-General.

22nd January, 1889.
Sir H. Robinson to Lord Knutsford.

South Africa, No. 164.
Government House, Cape Town, 4th March, 1889.

My Lord, – I have the honour to enclose for your Lordship’s information a copy of a despatch which I have received from the Administrator of British Bechuanaland, covering a copy of a Minute from the Surveyor-General reporting that certain Vryburg erven have been confiscated as derelict.

These lots are clearly part of the available Crown lands, and the question of their disposal must, I think, stand over until it is known whether your Lordship accepts or rejects the offer made by Mr. Murray on behalf of the Bechuanaland Exploring Company.

I have, &c.,

(Signed) HERCULES ROBINSON,
Governor and High Commissioner.

The Right Honourable Lord Knutsford,
G.C.M.G., &c., &c., &c.,
Colonial Office.

Sir Sidney Shippard to Sir H. Robinson.

Copy.

No. 47g.

Administrator’s Office, British Bechuanaland.
Vryburg, 19th February, 1889.

Sir, – I have the honour to enclose for your Excellency’s consideration a copy of a Minute from the Surveyor-General, covering a Minute from the Acting Civil Commissioner of Vryburg, forwarding a list of erven in this township confiscated under the Derelict Lands Act, Mr. Duncan had apparently not been informed of the confiscation of these erven when the representative of the Railway Company was in Vryburg, and he consequently did not include them in the statement of vacant Crown land near the Eastern Frontier which he gave to Mr. Murray. / He now requests instructions as to what course is to be pursued with regard to these erven, which should, in terms of the arrangements with Mr. Murray, have been included in the offer of vacant Crown lands on the Eastern frontier made to the Bechuanaland Railway Company.

I have, &c.,

(Signed) SIDNEY SHIPPARD,
Administrator.

His Excellency the Governor,
Cape Town.
Enclosure in Despatch No. 47G., 19/2/89.

Mr. Duncan to the Secretary.

Copy.

Vryburg,
19th February, 1889.

No. 819. Minute.

When the representative of the Railway Company was in Vryburg I told him that the proposed land grants of the Mafeking district included the whole of the vacant Crown land near the Eastern Frontier. It now appears that these confiscated erven were at the time also Crown land, and under these circumstances I suppose that the Railway Company ought to be so informed.

I shall be glad to know what is to be done with them.

At present they cannot be disposed of until definite instructions have been received concerning the Crown land near the Eastern Frontier, of which they form a part.

I enclose a sketch showing the confiscated erven in pink.

(Signed) A. H. F. DUNCAN,
Surveyor-General.

Mr. Scholtz to Mr. Duncan.

Vryburg,
14th February, 1889.

No. 420. Minute.

Enclosed please find list of erven confiscated under the Derelict Lands Act.

(Signed) C. B. SCHOLTZ,
Acting Civil Commissioner.

Lord Knutsford to Sir H. Robinson.

South Africa.

No. 94.

Downing Street,
28th March, 1889.

Sir, – I have the honour to acknowledge the receipt of your despatch No. 164 of the 4th instant, respecting the disposal of certain derelict erven in the Vryburg township.

I agree with you that the matter must stand over pending a decision on the proposals made by the Bechuanaland Exploring Company.

I have, &c.,

(Signed) KNUTSFORD.

The Right Honourable Sir H. Robinson, G.C.M.G.,
&c., &c., &c.
CAPE OF GOOD HOPE.
RAILWAY EXTENSION THROUGH BRITISH BECHUANALAND.


II.

AGREEMENT, DATED 23RD JANUARY, 1890, BETWEEN THE COLONIAL GOVERNMENT AND THE HONOURABLE C. J. RHODES.

Presented to both Houses of Parliament by command of His Exce- lency the Governor.

1890.

[...]

Railway Extension through British Bechuanaland (Cape Town: Government Printer, 1890).
I.

Agreement,

By and between Her Majesty’s High Commissioner for South Africa and Governor of British Bechuanaland, of the one part, and the Honourable Cecil John Rhodes, M.L.A., representing the British South Africa Company, of the other part, made at Cape Town on the twenty-third day of January, 1890, for the construction of a Railway from the Southern to the Northern Border of British Bechuanaland on the following terms and conditions, to wit:–

1. Railway to be made under certain conditions by the Company from the Southern to the Northern Border of British Bechuanaland via Taungs, Vryburg and Mafeking.

2. Land required for the Railway, of a uniform width throughout of 100 yards, and for all junctions, sidings and stations, and all other works and approaches and for any future extensions or branches, or other lines, to be given by Her Majesty’s Government, but the Company to pay compensation for any injury to improvements actually made and existing when the land is taken, whether it is taken from private proprietors or from native reserves, and also to pay compensation in case of the line passing through town or village erven.

3. No parallel or competing line to be constructed on British Territory or Territory under the British influence; and the Company to have the exclusive right of constructing on British Territory or Territory under British influence extensions and branch or other lines, so long as they maintain a reasonably efficient service on the Railway, the subject of this Agreement. / If Her Majesty’s Government require a line or lines other than a competing line to be constructed, which, in their opinion, would carry a remunerative traffic, and the Company refuse to construct within a reasonable time, then Her Majesty’s Government may make such line, or a Concession may be granted to other parties, but not on more favourable terms than offered to the Company, and Her Majesty’s Government then to have the right of calling on the Company to permit any other line to cross the line of the Company on terms which shall be reasonable and fair to the Company.

4. Maximum charges for carriage of passengers and goods, if exceeding that in force on the railways under the control of the Cape Government, to be subject to approval of her Majesty’s Government, and tables of charges to be exhibited at places of collection.

5. Company to keep the line in good repair, and to equip it with proper plant and rolling stock for its efficient working. Company to run at least three trains each way in every week.

6. In consideration of the premises, Her Majesty’s Government to grant to the said Cecil John Rhodes, in his said capacity as representing the British South
Railway Extension through British Bechuanaland

Africa Company, six thousand square miles in British Bechuanaland in consideration of railway construction to Vryburg, and, in case the said Cecil John Rhodes in his said capacity agrees to extend the said line of railway to Mafeking, to further grant six thousand square miles in British Bechuanaland, the selection of the land to be subject to mutual agreement, the title thereto to be in fee simple and free from all mineral reservations in favour of the Crown.

7. In case any arrangement be entered into by the said British South Africa Company for the lease or sale of the said line or any portion thereof, the same shall be submitted for the approval of the High Commissioner.

8. In case the British South Africa Company, or any such purchaser as aforesaid, shall discontinue the working of the said line, the High Commissioner shall have the right to enter and take and work the portion of the line in British Bechuanaland, and also to enter upon such portion of the land or other concessions or benefits accruing therefrom given to the Company in consideration of railway construction as shall be unsold at the time when the Company or purchaser aforesaid failed to fulfil their part of the contract; Provided that the High Commissioner shall hold and work such line and realise such land or other concession for the benefit of the said Company or purchaser, as the case may be; such Company or purchaser always retaining the right to resume the working of the said line with the High Commissioner’s approval.

9. The regulations with regard to rates of transit and transport for Government officials and goods to be the same as those in force in the Cape Colony, subject to modification by mutual agreement.

10. The Company to have the right to proclaim, set out, and sell town and village sites on any land of which they may become possessed.

11. In case of any dispute arising as to the terms or construction of this Agreement, the same shall be referred to the decision of the Chief Justice of the Cape Colony; and in the event of the said Chief Justice declining to arbitrate, then the same shall be decided by arbitration in terms of the Lands and Arbitrations Clauses Act, No.6, 1882.

In witness whereof the parties hereto, have hereunto affixed their respective signatures at the place and on the date first above written—

(Signed) HENRY B. LOCH,¹
Her Majesty’s High Commissioner for South Africa, and Governor of British Bechuanaland.

(Signed) C. J. RHODES,
Representative of the British South Africa Company.

In presence of:

(Signed) SIDNEY SHIPPARD, Witnesses. /

(GRAHAM BOWER, ̋)
II.

AGREEMENT, DATED 23RD JANUARY, 1890, BETWEEN THE COLONIAL GOVERNMENT AND THE HONOURABLE C. J. RHODES.

Made at Cape Town on the twenty-third day of January, 1890, by and between the Honourable Cecil John Rhodes, M.L.A., as representing the British South Africa Company, of the one part, and Sir John Gordon Sprigg, K.C.M.G., on behalf of the Government of the Colony of the Cape of Good Hope, of the other part, with reference to Railway Extension from Kimberley through British Bechuanaland, on the following terms and conditions, to wit:–

1. The Railway to Vryburg to be built on the following terms:–
   The Cape Government to raise and advance to Mr. Rhodes the necessary money on the same terms as they raise it.

2. The Cape Government to hold as security the line of Railway in addition to the six thousand square miles of land in Bechuanaland, which shall be duly hypothecated.

3. In case the Cape Government shall take over the line on or before the 30th June, 1891, the Cape Government shall be entitled to share in the proportion of two to one with Mr. Rhodes in the proceeds of all lands that may have been realized, and to be a partner in the proportion of two to one in whatever lands may at the date of purchase remain unsold.

4. It is understood that all lands sold must be subject to a substantial quitrent of not less than One Pound Sterling per thousand acres, and any lands unsold at date of taking over railway shall be jointly dealt with in the aforementioned proportion; it being understood that for a period of twelve months after the date of purchase of railway neither party shall sell his share without first giving the refusal to the other party, and in the event of this right of pre-emption not being acted upon, any lands sold subsequently shall be subject to the same substantial quitrent.

5. If either the Government of the Cape Colony or Mr. Rhodes shall at any time object or refuse consent to any proposal of the other for the sale or other disposition of the whole or any portion of the land referred to in this Agreement, or if any question or dispute shall arise between them relative to the management, sale, or other disposition of the whole or any portion of the said land, either party may call upon the other to refer and submit such proposal, question, or dispute to the arbitration of one arbitrator jointly appointed; or if no joint appointment can be agreed upon, then to the arbitration of the Chief Justice of the Cape Colony; and the decision of such arbitrator or of the Chief
Justice, as the case may be, shall be given with due observance of the terms of this Agreement and consideration of what is fair and reasonable, and shall, when given, be binding, final, and conclusive with respect to such proposal, question, or dispute.

6. In the final liquidation of the account either party shall have the right to purchase all the quitrents accruing to the other on a basis of twenty years’ purchase.

7. It is further understood that Mr. Rhodes binds himself to proceed with the Railway Extension from Vryburg to Mafeking, provided the Cape Government purchases the Kimberley-Vryburg Section on the foregoing terms, and he receives a further grant of six thousand square miles in Bechuanaland.

In witness whereof the parties hereto have hereunto affixed their respective signatures at the time and place first above written.

(Signed) C. J. RHODES,
For the British South Africa Company.
(Signed) J. GORDON SPRIGG.
HANDBOOK

TO THE

UGANDA QUESTION

AND PROPOSED

EAST AFRICA RAILWAY.

BY

ERNEST L. BENTLEY.

1892

[...]
expensive and difficult precaution, to pursue the evil to its home and kill it at its root, we shall not only have saved mankind from a fearful curse, but we shall have spared the Treasury of our own people and the lives of the gallant sailors.' – Lord SALISBURY at Glasgow, 20th May, 1891.

Extracts from the General Act of the Anti-Slavery Conference, July, 1890.

Chapter I.
Slave-Trade Countries. – Measures to be taken in the country of Origin.

Article I. – The Powers declare that the most effective means for counteracting the slave trade in the interior of Africa are the following:–

(1.) Progressive organization of the administrative, judicial, religious, and military services in the African territories placed under the sovereignty or protectorate of civilised nations:

(2.) The gradual establishment in the interior, by the Powers to which the territories are subject, of strongly occupied stations, in such a way as to make their protective or repressive action effectively felt in the territories devastated by slave-hunting:

(3.) The construction of roads, and, in particular, of railways, connecting the further (avancés) stations with the coast, and permitting easy access to the inland waters and on the upper courses of the rivers and streams broken by rapids and cataracts, in view of substituting economical and rapid means of transport for the present means of transport by men:

(4.) Installation of steamboats on the inland navigable waters and on the lakes, supported by fortified posts established on the banks:

(5.) Establishment of telegraphic lines, insuring the communication of the station and posts with the coast and administrative centres:

(6.) Organisation of expeditions and colonnes mobiles to keep up the communication of the stations with each other and with the coast, and to enforce the repressive action and insure the security of the routes (route de par cours):

(7.) Restriction of the importation of firearms, or at least of improved arms, and of ammunition throughout the territories infected by the slave trade.

Chapter I.

Article IV. – The States exercising sovereign powers or protectorate in Africa may in all cases delegate to companies provided with charters all or a portion of the engagements which they assume...

‘You will explain (to Prince Bismarck) that some prominent capitalists have originated a plan for a British settlement in the country between the coast and
the lakes which are the sources of the White Nile, and for its connection with
the coast by a railway.' – Lord Granville to Sir E. Malet, May 25th, 1885.

That the Brussels Act expressly refers to 'Territories placed under the sovereignty
or protectorate of civilised nations' with an evident and studied exclusion of what
are termed spheres of influence – therefore the Act has no connection with the East
Africa Railway.*

‘That without the Mombasa-Victoria Nyanza Railway, it is not only practi-
cally impossible to bring the great and populous region of Uganda into touch
with British interests, but it will assist materially in the suppression of slave tra-
ffic and in the abolition of the status of slavery Therefore, if for no other reason,
the project is deserving of all support of all who have at heart the welfare and
civilization of the great African continent.' – British Anti-Slavery Soci-
ety† to Parliamentary Candidates.

That in anglicising Central and Eastern Africa we must depend / less upon
the sword than on the influences of commerce, and the real pioneer of commerce
is the railway.

‘It costs two or three hundred times as much to bring goods by caravans as it
would cost to bring them by railway. Of course when once a railway existed cara-
vans would become a matter of antiquity, and if no caravans existed there would
be no means of carrying slaves from the interior to the coast.' – Lord Salisbury
at Glasgow, 20th May, 1891.

That if the East Africa Company cannot construct the railway out of its own
resources the work must be left undone.

That the Imperial British East Africa Company would not be any more
directly interested in the East Africa Railway than Her Majesty's Government is
benefited by the construction of the English railways.

‘The Mombasa and Victoria Nyanza Railway Survey Grant was submitted in
continuation and amplification of a policy which for many years past had actu-
ated Her Majesty's Government and the country in dealing with the suppression
of the slave trade in Eastern and Central Africa.' – Mr. J. W. Lowther.

That it would be an evil precedent for the Imperial Government to undertake
the construction of public works in territories in which it has no Government or
administrative authority.†

That it is, no doubt, of very great importance to be beforehand with Ger-
many in opening quick communication between the lake region and the coast,
as whichever nation wins this race will assuredly become the leading Power in
Eastern Africa.

* Note. – The Company's treaties covering the route include sovereign rights, and have all
been approved by Her Majesty's Secretary of State in terms of the Royal Charter.
† Note. – The Company's treaties with chiefs extend from the coast to the Victoria
Nyanza, and include sovereign and administrative rights.
That as soon as the railway advanced beyond the Zanzibar boundary it would pass through territory where England apparently has no locus standi of an official character.*

That as the construction of the railway cannot be carried out as a State work, except at a cost and responsibility which Parliament would hesitate to sanction, some agency must be employed, and the most eligible one which exists, both by reason of its administrative machinery and its cognate duties under its Charter, is the Imperial British East Africa Company.

That the Company will in time, as the commerce created by the railway flows through its ports, benefit largely by the work is certain, and so, also, to a greater extent, will the trade of Manchester and other centres of manufacturing industry. / That whilst the railway would check the slave trade, it would not be a commercial success – (see the ‘Commercial Aspect.’)

That Australian, New Zealand, and South African Colonies, to say nothing of India, have realised the urgency of investing largely in railways, and in new countries State guarantees are almost indispensable to attract the necessary capital.†

That, in fact, the salvation of Africa depends on a railway guarantee, and that, perhaps, for a limited period.

That it is an enormous undertaking to set about making and providing for the defence of a railroad some 500 or 600 miles long through a territory inhabited by warlike tribes.‡

That the bitterest opponents to the East Africa Railway are those who know least of its commercial possibilities, its political advantages, and its humanising issues.

That caravans in the British sphere are absolutely unremunerative, whilst a railway would not only effect the greatest economies in the conduct of our beneficent jurisdiction, but at the same time immensely stimulate British commerce.§

That the trade in hides alone would go a long way towards defraying the cost of railway construction.

* Note. – The Company’s treaties with chiefs extend from the coast to the Victoria Nyanza, and include sovereign and administrative rights.

† Note. – The Indian railways in the aggregate during 1891 did not draw anything from the guarantors.

‡ Note. – The Company has had caravans, some as small as 40 carriers, and has never lost an officer. The Government railway survey party did not fire a single shot in self-defence.

§ Note. – Transport is now £200 to £300 per ton to Victoria Nyanza.
That the East Africa Railway is to stretch across the belt of swamps which cuts off Uganda from the coast, in order that we may send an army along the line to seize and hold the province for a commercial Company.*

The proposed East Africa Railway is spoken of as if it were a ‘wild cat’ line of indefinite length ending in irreclaimable wildnesses, instead of reaching half-way to the lakes an elevated table land offering all the conditions for a prosperous European settlement.

That the East Africa Railway will bring our commerce into contact with 12,000,000 of people, whose wants will grow concurrently with the extension of civilization. / That the postponement of the East Africa Railway would be disastrous to humanity and injurious to the moral, religious, commercial, and political interests of the Empire.

‘That the cost of making the East Africa Railway, as compared with the vast sums we have expended in maintaining our vessels off the East Coast of Africa, is trifling’ – Mr. J. W. Lowther,\(^{5}\) Under Secretary of State.

That the locomotive in fact by means of competition would kill both the caravan and the kidnapper. Animals cannot be used owing to the prevalence in some places of the tsetse fly.

That if the East Africa Railway is not carried to the Victoria Nyanza it should be at once constructed to the Kikuyu highlands, where Europeans can settle in an exceptionally fertile and well-watered country.

That Germany, France, and the Congo State are making railways whilst we discuss evacuation.

That by substituting for this human porterage some better kind of transport the slave trade would die out.

*That the guaranteeing of a railway for the benefit of a private Company would be a dangerous precedent.\(^{†}\)

That the construction of the East Africa Railway specially recommends itself at a time when protective duties are closing so many markets to our manufacturers, whilst at the same time it would advance the cause of humanity, civilisation, and commerce.

* **Note.** – No swamp exists. The country gradually rises from the coast for the first 300 miles to an altitude of about 7,000 feet, then falls to the level of the lake, which is itself 3,850 feet above the sea. Kikuyu (half-way to the lake) is 6,000 feet, and the Mau plateau 7,000 to 9,000 feet.

† **Note.** – The only benefit to be derived by the Imperial British East Africa Company would be the Customs dues for administrative purposes. The guarantee would be for the direct benefit of the subscribers to the railway company – quite a distinct concern.
That Her Majesty’s Government proposed we should show (by the East Africa Railway) that our vaunted philanthropy was not a sham and our professions of humanitarianism were not mere hypocrisy.

That the Government must be prepared to fortify their railway, which might be done by making the stations fortresses and the signal boxes Martello towers, with guns raking the railway up and down.*

That Great Britain should recoup the Imperial British East Africa Company for its expenditure in Imperial objects, and guarantee the interest on the Victoria Nyanza Railway, in fulfillment of her obligations under the Brussels Act. / That if Uganda is to be left to anarchy, it is idle pushing forward a railway, of which the terminus will not be a British fort, but a region of unregenerate savages, with nothing except serfs to sell.

That a railway connecting Mombasa with the Victoria Nyanza would in any benefits which might thereby accrue to the coast, enable a more effective administration on the littoral to arrest the export of slaves by sea, and by its civilising effect upon the interior prevent the import of slaves from the lake region for agricultural or domestic purposes by the Arab and Swahili population of the coast area.

That the Parliamentary opponents of the grant for the East Africa Railway were justified in their action in the absence of essential information upon the merits of the case; but that they may with equal justification now reconsider the question apart from political bias in the light of the further intelligence and estimates available.

That during the debate upon the Survey Grant an extraordinary appetite was developed for information of a kind it was well known could not in the nature of things be forthcoming. The surveyors have, however, since dispelled many of the imaginary complications and gloomy apprehension then expressed.

That the greatest difficulties in the construction of the railway would be the supply of labour and food.†

That the easiest portion of the railway should be constructed, viz., to about 300 miles from the coast, leaving the mountainous part to be traversed by caravans until such time as it is desirable that the railway be extended to the lake.

That the question of holding Uganda must be decided before the railway could be constructed.

*Note. – The Company has stations along this route, but has not found such measures requisite. See note (†) at foot of previous page.
†Note. – The estimates provide for the importation of skilled Indian labour to ensure efficiency in construction. Abundance of food can be grown along the route of the line whenever required. Had any difficulty existed the railway could have carried supplies from the coast.
That to subsidise the East Africa Railway would be voting money for the benefit of a private Company,

That the entire Empire would, in the end, benefit by the preliminary expenditure of a Government Guarantee for the East Africa Railway.

That the substantial argument in regard to slavery was that in pursuance of the Brussels Act it could only be suppressed by a railway under guarantee, and, therefore, Parliament is bound to vote the Money.*

‘That when the railway is made the country can be held easily enough.’ – Lord Salisbury. /

[...]

* NOTE. – This is not quite correctly expressed. – (See the quotation from the Act.)
The Railway Extension from Charlestown to Johannesburg.  
Copy of Agreements dated 3rd and 12th February and 25th April, 1894 between the Governments of the Colony of Natal and the South African Republic (Durban: T. L. Cullingworth, 1894).

THE
RAILWAY EXTENSION
FROM
CHARLESTOWN TO JOHANNESBURG.
COPY OF AGREEMENTS,
Dated 3rd and 12th February, and 25th April, 1894.
BETWEEN THE
GOVERNMENTS
OF THE
Colony of Natal
AND THE
SOUTH AFRICAN REPUBLIC.

[...]
GOVERNMENT NOTICE NO. 67, 1894.

The following Agreement between the Governments of the South African Republic and the Colony of Natal, providing for the construction of a Line of Railway from Charlestown and Volksrust to a point of junction with the Main Line of the South African Republic, near Johannesburg, is published for general information.

JOHN ROBINSON,\(^1\)
Colonial Secretary.
Colonial Secretary’s Office, Natal,
12th February, 1894. /

Agreement dated the Third day of February, Eighteen Hundred and Ninety-four, between Jacobus Stefanus Smit, Esquire, Government Commissioner for Railways in the South African Republic; Gerrit Adriaan Arnold Middelberg, Esquire, Director of the Netherlands South African Railway Company; Maximiliaan Emile Hubert Breuning, Esquire, Chief Engineer of the Netherlands, South African Railway Company, Members of a Committee appointed by the Government of the South African Republic, and representing as such the aforesaid Government, and the Honourable Thomas Keir Murray, Minister of Lands and Works of the Colony of Natal; and David Hunter, Esquire, General Manager of the Natal Government Railways, Delegates of the Government of the Colony of Natal:

Whereas the Government of the South African Republic and the Government of the Colony of Natal, are mutually desirous of immediately extending the Railway communication now terminating at Charlestown, in the Colony of Natal, to Johannesburg and Pretoria, in the South African Republic:

And whereas an Agreement was on the 25th day of November, 1892, entered into between the Government of the South African Republic and the Government of the Colony of Natal, providing for the survey of the said Railway Extension:

And whereas the detailed survey of the said Railway Extension has been completed:

And whereas the Honourable the First Volksraad of the South African Republic did, by resolution, on the 25th day of August, 1893, approve of the building and construction of the said Railway Extension, and authorise the Government, with the advice and consent of the Executive Council, to take steps for the carrying out of such Resolution:

And whereas the Government of the South African Republic, with the advice and consent of the Executive Council as aforesaid, did, on the 4th day of January, 1894, finally decide upon the construction of the said Railway Extension:
Now therefore it is hereby agreed as follows:

Article 1. – That the Government of the Colony of Natal shall immediately extend its line of Railway from Charlestown to the boundary, between the Colony of Natal and the South African Republic.

Article 2. – That the Government of the South African Republic shall, with all possible speed, construct, equip, and work, or cause to be constructed, equipped and worked, a line of Railway from the terminus of the Natal Government Railway on the boundary via the towns of Volksrust, Standerton, and Heidelberg, to the station at Elsburg, or to such other point of the line of Railway between Vereeniging and Elandsfontein, as may be chosen by the Government of the South African Republic, provided always, that the through distance to Johannesburg and Pretoria as already surveyed, shall not be materially increased.

Article 3. – That the construction and the equipment of the lines of Railway referred to in Articles 1 and 2, shall be in all respects of equality as regards stability and efficiency with the best constructed lines of Railway in the Colony of Natal and the South African Republic, and serviceable for the conveyance of a heavy and fast traffic.

Article 4. – That the work of constructing the line of Railway referred to in Article 2 shall be commenced from the Volksrust and Johannesburg ends immediately, and that in order to accelerate the completion of the work the line of Railway from Delagoa Bay shall be utilised to convey the rails and other materials necessary for the construction from Delagoa Bay to the point of junction on the line of Railway from Vereeniging to Elandsfontein as soon as such Railway is sufficiently completed to permit of this being done, and it is hereby further agreed that the aforesaid line of Railway from Volksrust shall be completed and opened for public traffic to Johannesburg and Pretoria if possible by 31st July, 1895, but not later than 31st December, 1895, and that as soon as the line can possibly be made fit for traffic it shall be opened in sections from Volksrust to Standerton and Heidelberg respectively in anticipation of the opening of the line throughout.

Article 5. – That the Government of the Colony of Natal binds itself not to construct or work any extension of the line of Railway from Ladysmith to Harrismith which joins on any point to the north of Kroonstadt of the now existing line of Railway through the Orange Free State.

Article 6. – That near the boundary there shall be provided a joint station where the service of the Natal Government Railways Administration shall terminate and the service of the South African Republic Railway Administration shall commence, the site of this station to be in the option of the Government of the South African Republic, and the plans to be designed by one or other of the Administrations as may be arranged in conjunction with the other.
Article 7. – That the two contracting Governments bind themselves to promote in every way the practical and expeditious working of the through traffic from places in the Colony of Natal to places in the South African Republic, and from places in the South African Republic to places in the Colony of Natal, and to grant to each other all usual and useful facilities for the interchange, development, and satisfactory working of the traffic.

Article 8. – That in order to promote efficient cooperation an agreement shall be entered into between the two Railway Administrations, subject to the approval of the respective Governments, having regard to the following points: –

(a) The conditions for the use of the one Administration of the line of Railway from the boundary to the joint Station near the boundary, and for the common use of the said Station.

(b) Regulations for the interchange of rolling stock and goods in through traffic, payment for hire of rolling stock, the through traffic in passengers, goods, animals, articles, and things, the facilities for the loading, unloading, collection, and delivery of goods, the system of dividing and accounting for the proportions of fares and freights due to the respective Administrations, and all other practical details which are necessary to secure efficient and economical working.

(c) The harmonising of the Systems, whereby the rolling stock of the respective Administrations, with their continuous break and other appliances, may conveniently couple and interchange with each other.

(d) The mutual assistance to be rendered by the one Administration to the other in the matter of staff, labour, and other matters in which such mutual assistance would be possible and beneficial.

Article 9. – That the running of the trains on both lines of railway shall be so regulated as to avoid unnecessary delay, and so as to afford the best possible through service.

Article 10. – That the consignment notes for through traffic shall be drawn up by both Railway Administrations in conjunction with each other, and shall be printed in both the Dutch and English languages.

Article 11. – That the Railway Administration of each Government shall fix the rates applicable to its own line, and in the case of the route via Volksrust, the through rates for goods traffic from Port Natal to Johannesburg and Pretoria shall be the sum of the two Administration rates, provided always that the rates for ordinary goods per mile and per ton of 2,000 lbs. shall not exceed 6d. per mile and per ton, and shall not be lower than 3d. per mile and per ton, and that the rates for rough goods (that is to say coal, stone, unmanufactured wood, &c., in quantities of at least five tons) shall not exceed 3d. per mile and per ton, and shall not be lower than 1½d. per mile and per ton.
Article 12. – That if the through rates from Port Natal to Johannesburg and Pretoria upon the aforesaid basis shall become higher than the rates from Delagoa Bay to Johannesburg and Pretoria, in proportion to the mileage of the lines of both Administrations, then the through rates from Port Natal to those places shall, after consultation between the two Railway Administrations, be reduced to the proper proportions, but neither of the two Administrations shall be bound to accept lower rates than the minimum rates specified in Article II, and the rates from Port Natal to Johannesburg shall not in any case be more than 20 per cent. higher than the corresponding rates from Delagoa Bay to Johannesburg, and the rates from Port Natal to Pretoria shall not in any case be more than 40 per cent. higher than the rates from Delagoa Bay to Pretoria.

Article 13. – That should any circumstance arise which may necessitate reconsideration of the rates and other arrangements herein set forth in connection with the promotion of the traffic, either Administration may at any time call upon the other Administration for consultation, with a view to making the necessary alterations.

Article 14. – That the Government of Natal binds itself to fix the rates to be charged on its lines of Railway in the Colony of Natal, and (subject always to its existing obligations) on Railways worked by it in other States, in such manner that the sum of the rates charged by the Railway Administrations of Natal and the South African Republic shall not be lower than the rates per mile and per ton on the traffic between Delagoa Bay and Johannesburg and Pretoria.

Article 15. – That the rates for the conveyance of passengers over the lines of both Railway Administrations, shall not exceed the following:– First class 3d. per mile, lowest class 2d. per mile.

Article 16. – That the Government of the Colony of Natal binds itself not to charge on goods from Foreign ports and destined for places in the South African Republic dues which are higher than the transit duties which are now in force, or lower than the transit duties at Delagoa Bay, and the Government of the South African Republic shall afford to the Government of Natal all trade facilities which may have been or may be granted to any other Government.

Article 17. – That the two contracting Governments bind themselves to cooperate in every way to ensure the substantial and speedy construction of the line of Railway referred to in Article 2, and the Government of the Colony of Natal shall convey over its existing lines all materials, goods, or things necessary for the construction and working of the aforesaid Railway, with the least possible delay, at the rate of one penny and one halfpenny per ton and per mile, and shall pass all such materials free of all Customs and transit dues.

Article 18. – That in the event of it being found that either of the routes via Delagoa Bay or Charlestown is carrying a share of the gross goods traffic from the seaboard to Johannesburg and Pretoria which shall exceed one-half or to be less than one-third of such gross goods traffic, the two contracting Govern-
ments agree that upon the application of / either, a further Conference shall take place for the purpose of reconsidering the rates, and making such re-adjustment thereof as shall be calculated to bring about a more equitable division of the traffic carried by both routes.

Article 19. – That it shall be understood between the two contracting Governments that they shall work together in a spirit of amity and friendship for the promotion of the traffic between the South African Republic and the Ports of Delagoa Bay and Natal, and all the provisions of this Agreement shall be construed in the sense of the said understanding.

Article 20. – That any dispute or question arising out of this Agreement shall be referred to arbitration, each Government to appoint one arbitrator and the two arbitrators so appointed to appoint a third, and if the said two first arbitrators shall not agree upon the selection of a third arbitrator, then the Chief Justice of the South African Republic, upon application made by either party, shall appoint such third arbitrator, and the award of the majority shall be final.

Article 21. – This Agreement is subject to the approval of the Government of the South African Republic.

Article 22. – This Agreement is subject to the approval of the Government of the Colony of Natal, on or before the 20th February, 1894.

J. S. SMIT,
Government Commissioner for Railways in the South African Republic.

[...]
Pietermaritzburg,
12th February, 1894.

GOVERNMENT NOTICE No. 119, 1894.

The following Agreement, dated the 12th day of February, 1894, for the proper carrying out of the provisions of the Agreement entered into upon the 3rd day of February, 1894, for the extension of Railway communication from Charlestown to Johannesburg and Pretoria, is published for general information, together with a letter from the Natal Delegates to the Chairman of the Railway Commission at Pretoria, relative to the establishment of Railway communication between the Main Line of the Natal Government Railways and Vryheid.

JOHN ROBINSON,
Colonial Secretary.
Colonial Secretary’s Office, Natal,
29th March, 1894.

Agreement, dated the Twelfth day of February, 1894, between the Railway Administration of the Government of the South African Republic for the time
The Railway Extension from Charlestown to Johannesburg

being, the Netherlands South African Railway Company, represented by Maximiliaan Emile Hubert Breuning, Esquire, Engineer-in-Chief, and the Railway Administration of the Government of the Colony of Natal, represented by David Hunter, Esquire, General Manager of the Natal Government Railways.

Whereas an agreement entered into upon the Third day of February, 1894, between representatives appointed by the Government of the South African Republic and Delegates of the Government of the Colony of Natal providing for the immediate extension of Railway communication now terminating at Charlestown, in the Colony of Natal, to Johannesburg and Pretoria in the South / African Republic, has been approved by the Governments of the South African Republic and the Colony of Natal respectively: and

Whereas it is expedient that a further agreement should now be entered into between the Railway Administrations of the Government of the South African Republic and the Government of the Colony of Natal for the proper carrying out of the provisions of the aforesaid Agreement:

Now, therefore, it is hereby agreed as follows:–

Definitions.


‘Contractor’ shall mean the Railway Administration of the Government of the Colony of Natal.

‘The Engineer-in-Chief’ shall mean the Engineer-in-Chief of the Railway Administration of the Government of the South African Republic.

‘The Resident Engineer’ shall mean the Chief Engineer in charge of Construction appointed by the Railway Administration of the Government of the Colony of Natal.

‘The Engineer’ shall mean the Sectional Engineer entrusted with the execution and supervision of the work.

‘The Railway’ shall, unless otherwise specifically mentioned, mean the Line of Railway with Sidings and other accessories thereto, and works of every description, from the boundary of the South African Republic at or near Volksrust, to the point of junction with the Line of Railway from Vereeniging to Elandsfontein. /

Article 1. – That the Administration entrusts to Contractor, and Contractor hereby undertakes to carry out, the construction of the Railway from the boundary of the South African Republic, near Volksrust, to the point of junction with the Line of Railway from Vereeniging to Elandsfontein as shall be determined by the definitive plans, provided always that, in order to expedite the completion of the Railway, it shall be competent for the Administration and Contractor to
agree that the portion of the Railway between the said point of junction and Heidelberg, shall be constructed by the Administration.

Article 2. – That the Survey of the Railway carried out in terms of the Agreement, dated the 25th day of November, 1892, between the Government of the South African Republic and the Government of the Colony of Natal, shall be the basis of the construction of the Railway, subject to such modifications and improvements as may be found expedient.

Article 3. – That the Construction of the Railway shall be carried out by Contractor in terms of the Agreement, dated the 3rd February, 1894, between the Government of the South African Republic and the Government of the Colony of Natal, and that the work shall be executed in the same manner in every respect as if it were being done in the interests of Natal.

Article 4. – That the work to be undertaken by Contractor shall consist of the preparation of plans, the construction of the earthworks, masonry, stone-facings and stone-slopings, the ballasting of the Line, the laying of the Rails, the construction and erection of all Station Buildings, Railway Servants’ Cottages, and Locomotive and Goods Sheds, the erection of the superstructures of Bridges, the laying of Pipes for carrying off Water, the fixing of Signal systems and appliances for supplying Water, the erection of Telegraphs, and generally the performance of all the work / implied in Railway Construction, which definition shall be held to include the supplying of the necessary Engineering, Clerical, and Supervising Staff, skilled and unskilled labour, implements, utensils, building and all other material (excepting such as shall be furnished by the Administration according to Article 9), the transport of all building material and plant, the delivery of beacon posts, mile-posts, fittings, and everything required in surveying and setting out the earth, masonry, and iron works, and for the satisfactory completion of the works.

Article 5. – That in preparing the plans of Station Yards, Buildings, Houses, Culverts, Bridges, and such like, the adopted types of the Administration shall be followed as closely as possible.

Article 6. – That the Railway shall be constructed according to the normal transverse section to be fixed by the Administration.

Article 7. – That in case Contractor shall decide to give out to a Contractor or Contractors any part of the work, the subject of this Agreement, such work shall be put up to public tender, under conditions to be approved by the Engineer-in-Chief, and the lowest tenderer shall be entrusted with the work, unless the Resident Engineer and the Engineer-in-Chief decide that, in the best interests of the work, another tender shall be accepted.

Article 8. – That for the purpose of carrying out the work, the Engineer-in-Chief and Resident Engineer shall divide the Railway into approximate sections. Before commencing the construction of a section, Contractor shall lay out the
Article 9. – That the Administration shall deliver free of charge to Contractor at the landing wharf at Port Natal, or at the junction between Vereeniging and Elandsfontein, referred to in Article 1 (for the portion of the Line which may be constructed from that end of the Railway), all the necessary rails, sleepers, and points, with accessories, the iron work of the bridges, the material for the telegraph, pipes, signals, mile-posts, water appliances, furniture and rolling stock, and such material shall be delivered by the Administration to Contractor, so that no delay shall be caused to Contractor in carrying out the work; provided always that the actual cost of all such material shall be paid for to the Administration by Contractor, and shall be recovered by Contractor from the Administration, as provided for in Article 15.

Article 10. – That the works entrusted to Contractor shall be handed over complete to the Administration on or after the 31st July, 1895, but not later than the 31st December, 1895; provided always that if by reason of any unforeseen event beyond the control of the two contracting parties, such as unusual floods causing destruction of bridges or otherwise, wrecks of vessels containing Railway materials for the Railway, or act of God generally, Contractor shall not be able to complete the Railway within the specified time, such further time shall be granted to Contractor for the completion as may be decided upon by agreement between the two contracting parties, or in case of difference, by arbitration as provided for in Article 17; provided further, that if without the intervention of such special causes Contractor shall fail to complete the aforesaid works before the 31st July, 1896, the Administration may then, without further notice, take over the works and complete them by its own staff and means.

Article 11. – That Contractor and the Administration shall co-operate so that the use of the Railway for public traffic from the Colony of Natal to Standerton / and Heidelberg, respectively, or from the point of junction with the line of Railway from Vereeniging to Elandsfontein to Heidelberg, and vice versa, may be assured at the earliest possible date, in anticipation of the opening of the Railway throughout to Johannesburg and Pretoria.

Article 12. – That the execution of the works shall be carried out in accordance with the specification here to annexed, which, after being adjusted between Natal and the Administration, and in token thereof signed by the Engineer-in-Chief and Resident, Engineer shall be held to be a part of this Agreement.

Article 13. – That so far as may be reasonable or possible under the Law of the South African Republic, the Administration shall obtain and afford to the Engineers, Surveyors, Contractors, and other Officers, and to the other mem-
bers of the Staff employed by Contractor upon the work of Construction, every facility for entrance upon land, and shall place Contractor, without loss of time, in possession of all land required for the purpose of this Agreement, including land required for the raising and carrying of Materials, sites for Stations, Goods Sheds, Signal Stations, Platelayers’ Cottages, Residences for Railway Servants, Sidings, Watering Places for Railway purposes, and otherwise, as may be deemed requisite, convenient, and necessary for the Construction and proper equipment of the Railway and all accessories thereto, and the Administration shall further give to Contractor all other usual and useful facilities for carrying out the work of Construction.

Article 14. – That all tents and other equipments, Instruments, Horses, Mules, Oxen, Carts, Wagons, and other materials used for the purposes of Construction of the Railway shall be allowed to pass into and through the South African Republic free of all Customs Duties.

Article 15. – That Contractor shall accept as payment for the Construction of the Railway, including the salaries and wages paid, materials supplied, payments to Contractors and all other charges, the actual amount expended without adding any profit whatsoever, and such amount shall be refunded to Contractor by the Administration, at the option of the latter, either in cash or in Debenture Bonds bearing interest at the rate of Four per centum per annum, redeemable within Forty five years, the interest and redemption of which shall be directly guaranteed by the Government of the South African Republic, in manner following, that is to say:–

On the first day of each month, the Resident Engineer and the Engineer-in-Chief shall agree upon and certify a statement setting forth the value of materials provided and work done during the preceding month: such certificates shall be as closely approximate as possible and represent in globular sums the value due to Contractor, and upon receipt of such statement, duly certified as aforesaid, the Administration shall either pay to Contractor the amount in cash, or issue the aforesaid Debenture Bonds of One Hundred Pounds Sterling each for every Ninety-five Pounds Sterling of the amount payable to Natal, the interest upon such Bonds being payable half-yearly, and the interest being calculated from the fifteenth day of the month during which the expenditure by Contractor was incurred.

Article 16. – That the Administration shall within six months from the date of this Agreement notify in writing to Contractor the total amount of money which Contractor will be required to advance against the Debenture Bonds referred to in Article 15, but the amount of money to be so advanced by Contractor shall not in any case exceed One Million Two Hundred and Fifty Thousand Pounds Sterling; provided further, that in the event of the Administration desiring within six months from the date of this Agreement to redeem
any Bonds which may have been issued during that period, under the provi-
sions of Clause 15, such Bonds shall be exchanged by Contractor for the sum
advanced by Contractor thereupon, with the addition of interest at the rate of
Four per centum per annum.

Article 17. – That any dispute or question arising out of this Agreement shall
be referred to Arbitration, each Administration to appoint one Arbitrator, and
the two Arbitrators so appointed to appoint a Third, and if the said two first
Arbitrators shall not agree upon the selection of a third Arbitrator, then the
Chief Justice of the South African Republic, upon application made by either
party, shall appoint such third Arbitrator, and the award of the majority shall
be final.

Article 18. – This Agreement is subject to the approval of the Netherlands
South African Railway Company.

Article 19. – This Agreement is subject to the approval of the Government
of the South African Republic.

Article 20. – This Agreement is subject to the approval of the Government
of the Colony of Natal.

M. BREUNING,
Engineer-in-Chief of the Netherlands South African Railway Company.

DAV. HUNTER,
General Manager of the Natal Government Railways.

The Netherlands South African Railway Company hereby signifi-
cates its approval of the foregoing Agreement.

G. A. A. MIDDELBERG,
Director.

Pretoria, 13th March, 1894. /

Pietermaritzburg, March 28th, 1894.

Pretoria, February 7th, 1894.

COPY.

STR., – With reference to the desire of the Government of the South African
Republic, to establish Railway communication between the Main Line of the
Natal Government Railways and Vryheid, we have now the honour to state, on
behalf of the Government of Natal, that when the Government of the South
African Republic shall be prepared to construct the said Railway in its own Ter-
ritory, the Government of the Colony of Natal will undertake to construct at
its own expense, that portion of the said Railway within the Colony of Natal,
and to bear one half of the expense of the Bridge to carry the said Railway / over
the Buffalo River. This undertaking is subject to the approval of the Agreement,
dated 3rd February, 1894, by the Government of Natal.

WHEREAS, under the agreement dated the Third day of February, 1894, between the Government of the Colony of Natal and the Government of the South African Republic, it was provided by Article 8 as follows:–

‘Article 8. – ‘That in order to promote efficient co-operation an agreement shall be entered into between the two Railway Administrations, subject to the approval of the respective Governments, having regard to the following points:–

‘(a). The conditions for the use by the one Administration of the Line of Railway from the boundary to the joint Station near the boundary, and for the common use of the said Station.

‘(b). Regulations for the interchange of Rolling Stock and Goods in through traffic, payment for the hire of Rolling Stock, the through traffic in Passengers, Goods, Animals, Articles and Things, the facilities for the loading, unloading, collection and delivery of goods, the system of dividing and accounting for the proportions of Fares and Freights due to the respective Administrations, and all other practical details which are necessary to secure efficient and economical working. /

‘(c). The harmonising of the systems whereby the Rolling Stock of the respective Administrations, with their Continuous Break and other appliances, may conveniently couple and interchange with each other.

‘(d). The mutual assistance to be rendered by the one Administration to the other in the matter of Staff, Labour, and other matters in which such mutual assistance would be possible and beneficial’

NOW, THEREFORE, it is hereby agreed as follows:–
Definitions.

‘Natal’ shall mean the Railway Administration of the Government of the Colony of Natal.


‘Through Traffic’ shall mean Passengers, Goods, Animals, Articles, and Things passing over portions of the Lines of both Railway Administrations.

‘Local Traffic’ shall mean Passengers, Goods Animals, Articles, and Things passing over the Lines of only one Administration.

‘Up Trains’ shall mean Trains from the Colony of Natal.

‘Down Trains’ shall mean Trains from the South African Republic.

‘Mileage Charges’ shall mean the Rates per Mile to be paid to the owning Administration for the running of their Vehicles over the Lines of the other Administration.

A ‘Train’ shall mean an Engine with or without Vehicles attached. / 

Article 1. – That the boundary Station of Natal shall be at Charlestown, and the boundary Station of the Administration shall be at Volksrust, and that the Main Line of Railway between the two boundary Stations shall be used in common by both Administrations for the interchange of Traffic, subject to working regulations to be agreed upon between the two Administrations, provided always that each Administration shall maintain, repair, and keep in good working order the portion of Railway on its own side of the boundary, and shall be responsible for the Vehicles composing the Train coming from its Line, until they have been accepted by the other Administration at the boundary Station.

Article 2. – That the distance from Charlestown Station to the boundary shall be reckoned as Two Miles and Three-quarters (2¾), and the distance from Volksrust Station to the boundary shall be reckoned as Three-quarters (¾) of a Mile.

Article 3. – That all Up Trains conveying Traffic for the South African Republic shall be worked by Natal Engines and Staff (viz., Engine Drivers, Firemen, Guards, Conductors, and the like) to Volksrust, where all Traffic with the relative Waybills, Invoices and other documents shall be handed over by the Guard or Conductor to the Administration, and in like manner that all Down Trains conveying Traffic for the Colony of Natal shall be worked by the Engines and Staff of the Administration to Charlestown, and the charge to be made by the one Administration for working a Train over the Line of the other shall be at the rate of TENPENCE per Train Mile run, and the working back of the Engines and Staff from the one boundary Station to the other, after completing the journey, shall be arranged by the local officers of the two Administrations.
Article 4. – That any Shunting necessary in dealing with the Through Traffic at either boundary Station shall, if required, be performed by the Engine and Staff of either Administration without charge to the other, provided always that if it should appear after a period of trial that undue advantage is gained by one Administration over the other by this arrangement, it shall be competent for either Administration to call upon the other to further consider it, with a view to an equitable readjustment.

Article 5. – That Water, Coal, and other Stores shall be supplied, if required in emergency, by the one Administration to the Engines of the other, at the following rates, viz.: Water, Two Shillings and Sixpence per Tank; Coal One Shilling and Sixpence per Hundredweight; and Oil, Tallow, and other Stores at cost price.

Article 6. – That in case of accident or breakdown in the neighbourhood of the boundary, each Administration shall assist the other with Engine power, Rolling Stock, Staff, and appliances, and the Administration so assisting shall be repaid the actual expense incurred by the Administration assisted, it being understood that train mileage shall be paid for at the rate of Tenpence per Mile, and in case of Shunting, other than for Through Traffic, as provided for in Article 3, at the rate of Six Shillings per hour.

Article 7. – That in the event of one Administration requiring to borrow from the other Engine power, Rolling Stock, or plant for local purposes, such may be done subject to special arrangements as to terms.

Article 8. – That the arrangements for the interchange of Through Traffic shall specially include the running of Passenger Carriages of a superior type, with lavatory and sleeping accommodation, and Luggage Vans, between Durban and Johannesburg and Pretoria, and that any wagon loaded with Through Traffic to half its carrying capacity shall be run through to its destination without transhipment.

Article 9. – That each Administration shall hand over to the other in good and safe running order all Vehicles conveying Through Traffic, and any defect or damage appearing on examination at the boundary Station where the Train is handed over, shall be pointed out by the Clearing Officer at the boundary Station to, and noted by, the Guard of the Train, who will also record the same in his Train Journal for the information of his superior Officers, provided always that any vehicle which may be considered unfit to travel may be detached from the Train by either Administration.

Article 10. – That each Administration shall be responsible for damage to Rolling Stock occurring whilst in its possession, and the owning Administration shall be entitled to recover from the other the actual cost of repairing damage proved as in Article 9, plus 10 per cent. for supervision, in all cases when such cost shall exceed Five Pounds Sterling.
Article 11. – That at each of the boundary Stations there shall be appointed an independent Clearing Officer, one appointed by Natal, the other by the Administration, who shall record the numbers and description of all Vehicles, loaded or empty, passing from the line of one Administration to the other, and the hour of their arrival, with all damages or defects which may be discovered by the Carriage and Wagon examiners, the Clearing Officer at Volksrust recording the Vehicles brought by all ‘Up Trains,’ and the Clearing Officer at Charlestown recording the Vehicles brought by all ‘Down Trains.’

Such Clearing Officers shall be appointed and paid jointly, and shall forward to each Administration Monthly Returns, according to the forms supplied and joint instructions given from time to time.

Article 12. – That in the event of a Vehicle belonging to one administration being damaged on the Line of the other, such damage shall be made good by the latter, so far as to enable it to be returned without delay to the owning Administration, which shall forward free of cost upon application such parts or portions of Vehicles as may be necessary, and broken or damaged portions of Vehicles shall in like manner be returned to the owning Administration.

Article 13. – That the Rates to be charged by the one Administration against the other in respect of Vehicles of / the one passing over the lines of the other, or detained thereupon, as the case may be, shall be as under:–

Passenger Carriages and Vans, Id. per hour and per axle: all other Vehicles, 3/4d. per hour and per axle,

Note. – No charge shall be made upon spare or Reserve Vehicles of one Administration, which by mutual arrangement are kept upon the Line of the other Administration nor upon Vehicles which may have been, detained by accident, for repairs, or some unavoidable cause explained satisfactorily to the owning Administration.

Article 14. – That the Vehicles of one Administration shall not be employed upon the Lines of the other Administration for local Traffic, without the permission of the owning Administration, provided, however, that Vehicles returning to the Line of the owning Administration may be loaded to any Station on the Main Line route of return.

Article 15. – That the working of the Vehicles of the one Administration over the Lines of the other, shall be regulated as far as possible so as to avoid money payments; but should one Administration be unable to furnish its quota of Rolling Stock, the other Administration may arrange to supply the deficiency, and in such case mutual arrangements shall be made for periodical payment to the latter of the charges provided for in Article 13.

Article 16. – That the Through Rates for ordinary Goods shall include loading and unloading, and that the expense of such loading and unloading shall be borne without addition to the Through Rate by the forwarding or receiving
Administration, as the case may be; provided always that the contract price for collection or delivery (as the case may be), where such service is given, shall be matter of agreement between the two Administrations.

Article 17. – That further details having reference to Train Service, Passenger Accommodation, Fares to be / charged, Rates for Parcels and other Traffic conveyed by Passenger Trains, the classification, collection, and delivery of goods and other Traffic, shall be arranged from time to time by correspondence or conference between the Administration and Natal.

Article 18. – That through Tickets for Passengers and Through Waybills, or Invoices for Goods, Animals, Article, and Things, shall be issued between any Station of the one Administration to any Station of the other Administration, as may be arranged from time to time, and that the division of the receipts for ‘Through Traffic’ between the two Administrations shall be arranged upon a ‘Clearing’ System of Accounts, and a Through Mileage Table of Distances, to be adjusted between the two Administrations, which latter shall be based upon the distances from the boundary where the Lines of the two Administrations join; providing always that in calculating ‘Through Rates’ upon the said Mileage Table, fractions of a Mile under a quarter of a Mile shall not be reckoned, and those over a quarter of a Mile shall be reckoned as a whole Mile.

Article 19. – That monthly Accounts of Through Traffic and other matters, the subject of this Agreement, shall be rendered by each Administration to the other not later than the Twentieth of the succeeding month, and that Settlement thereof shall be made within one Calendar Month thereafter, provided always that any errors or omissions in the said Accounts detected by the Accounting Officers of the respective Administrations shall be notified each to the other, and adjusted in the next Account, to the intent that the Accounts as rendered may be paid without alteration, deduction, or addition.

Article 20. – That the arrangements for dealing with the Goods Traffic at the intended Temporary Termi at Standerton and Heidelberg shall follow the practice hitherto adopted in Natal, of providing Shed Spaces, which may be let to the Forwarding Agents, and that with a view to make the arrangements work smoothly, Natal / shall supply for temporary service to the Administration, and at the expense of the latter, an Officer acquainted with the methods of working hitherto pursued in dealing with the Through Traffic at the Natal Termi.

Article 21. – That should the Administration so desire, Natal shall work by its own Engines, Rolling Stock, Enginemen and Guards, either wholly or partially, the Traffic to and from Standerton, upon the opening for public Traffic of the first section of the Railway from Volksrust to Standerton, and in such event timeous arrangements as to terms and other details shall be made between the two Administrations.
Article 22. – That at Johannesburg and Pretoria the Administration shall provide adequate Goods Shed accommodation for Traffic from Natal, and shall include in their collection and delivery arrangements the traffic to and from Natal, and give in every respect the same facilities thereto as may have been, or may be given to the similar Traffic by other routes, and that all cranes, platforms, loading banks, and other appliances and conveniences necessary for dealing with special classes of Traffic shall, in like manner, be provided by the Administration.

Article 23. – That the responsibility for any loss or damage to life, limb, or property occurring upon the Line of one or other of the Administrations, or in the case of the Common Line between Charlestown and Volksrust, through the fault of any Employé of such Administration shall be borne by such Administration, provided always that in cases where loss, damage, or delay to Goods, Animals, Articles, or Things in Through Traffic in which it is not possible to fix the whole blame upon one Administration, after enquiry and correspondence, any compensation paid to the public shall be borne by both Administrations in the proportion of the freight received by each, provided further that the particular Administration against which such a claim for compensation may be made in respect of Through Traffic may, in its discretion, settle such claim, if not exceeding Twenty Pounds in amount, and advise the other Administration thereof.

Article 24. – That in order to facilitate the interchange of the Rolling Stock of the respective Administrations. Natal shall gradually adopt the Standard Pipe and Coupling of the Automatic Vacuum Break now in use by the Administration, and shall, until the Rolling Stock has in this respect been completely assimilated, furnish the Brass Rings necessary to enable the present arrangements to couple, a supply of which the Guards of both Administrations shall carry as part of their kit, and it is further agreed that the shorter links necessary to enable the Rolling Stock of the respective Administrations to couple together, shall be supplied by Natal to the Administration at cost price; a supply of these being also a part of the kit of the Guards of both Administrations.

Article 25. – That in case modification of any of the arrangements herein set forth may be necessary through alteration in circumstances, it shall be competent for either Administration to claim reconsideration thereof, and any alteration that may be deemed desirable shall be agreed upon mutually between the two Administrations.

Article 26. – This Agreement is subject to the approval of the Government of the Colony of Natal.

Article 27. – This Agreement is subject to the approval of the Government of the South African Republic.

(Signed) DAVID HUNTER,
General Manager of the Natal Government Railways.

[...]
MEMORANDUM ON THE QUESTION OF THE DELAGOA BAY RAILWAY.

I. – The History of the Delagoa Bay Railway.¹

IN 1875 a Treaty of Friendship and Commerce was concluded between Portugal and the South African Republic. It was ratified in 1882, and is in force for twenty years from that date.

By a Protocol annexed to it, Portugal engaged to assist in the construction of a line from Lourenco Marques to the frontier of the South African Republic, by giving to any substantial Company formed for that purpose a subvention equal to half the estimated cost, with sundry other privileges. The Company would have the exclusive right of working the railway for ninety-nine years (subject to a right of redemption), at the end of which time it would revert to the Portuguese Government without compensation. The South African Republic, in return, bound itself to continue the line from the frontier to a centre of production and consumption.
By clause 8 of the Treaty, merchandize imported through Delagoa Bay for the South African Republic might be subjected to an import duty of 3 per cent., which might be raised to 6 per cent. if necessary to meet interest and sinking fund on the subvention to the Railway Company, but as soon as the capital had been redeemed, the import duty was to be reduced to 1½ per cent.

Between 1876 and 1879 attempts were made to obtain funds for both sections of the projected line, but they proved abortive.

In 1882 Major Machado made, for the Portuguese Government, plans of the Portuguese section.

On the 14th December, 1883, the Portuguese Government gave a Concession to E. MacMurdo (a United States' citizen) for constructing a line from Delagoa Bay to the frontier of the South African Republic. He did not ask for any subvention from the Portuguese, and therefore he obtained other advantages not contemplated in the Protocol to the Treaty of 1875. The principal conditions were as follows: MacMurdo to form a Portuguese Company domiciled at Lisbon within six months of signing the contract. The Company to have the exclusive right to construct and work the line and its telegraphs, with the quays, docks, &c., necessary for development of traffic. The Concession to last for ninety-nine years, after which the line would revert to the State. No other line (‘linha ferrea’) to be constructed within 100 kilom. (62½ miles) on either side of the line which could compete with it. The Company to complete the line within three years of its plans being approved by the Government. If, after beginning the line, the Company failed to complete it or to carry out the terms of the contract, the line to be put up to public auction during six months and sold to the highest bidder, the price received, less the expenses of the Government, being paid over to the Company; but if there was no bid, the line to revert to the Government without payment. Any proved case of force majeure\(^2\) to be exempt from these conditions. There was also an arbitration clause.

The Company were further to receive a grant of 250,000 acres of land in perpetuity, with a large block, on the harbour of the bay.

As the Contract was silent on the point, it followed that the Company had the right to fix their own tariffs without Government interference. This right was on several occasions acknowledged by the Portuguese Government.

The general direction of the railway was to follow Machado's plans, which were to be submitted to the Company for consideration on points of detail. This was done, and the Company's recommendations were approved by a Royal Decree of the 30th October, 1884, which specified the length of the line to the frontier as being 81.970 kilom., at which point the word 'frontier' was marked on the plans. It followed that the line had to be completed by the 30th October, 1887.

Within five months of the signature of this Contract the Transvaal Government commenced a war of intrigue against it, which was actively pursued until
the confiscation of the line in 1889; but it is impossible within the limits of this Memorandum to do more than sketch their proceedings in the briefest outline.

In May 1884 the Deputation (Krüger, Du Toit, and Smit) who had come to London to negotiate for an amendment of the Pretoria Convention visited Lisbon. They informed the Portuguese Government that they were negotiating with a powerful Dutch Syndicate for the construction of their section of the line, and that the Syndicate were anxious to get the Concession for the Portuguese section. They threw doubt on the ability of MacMurdo to carry out his Contract, and asked the Portuguese Minister to use his influence to get the Contract transferred to the Dutch Company, or at least to grant them land at Delagoa Bay, and the right to construct a 'tramway' from the bay to the frontier. They worried the Minister to such an extent that he made them a formal promise (1) that if the Delagoa Bay line was not completed in time to assist the construction of the South African Republic line, he would allow them to construct a tramway for the sole purpose of transporting their railway material, and (2) that if MacMurdo's Concession should be annulled through failure to carry out his engagements, it should be transferred to the future Dutch Company.

Still, the Deputation were not satisfied. They affected to fear that MacMurdo's Company would abuse its right to fix the tariffs over its line, and they again demanded the immediate right to construct and work a tramway (i.e., for all purposes, and not merely for the transport of their railway material from Delagoa Bay to the frontier).

The Portuguese Government advised them to attempt to come to some understanding with the Lourenço Marques Company on the question of tariffs; and on the 16th May the Minister of Marine replied to their representations by an absolute refusal to agree to them so long as the Portuguese Company fulfilled its engagements. He said that to give a public undertaking of the kind would be 'absolutely disloyal,' as it would be 'hanging a sword of Damocles over the head of the Lourenço Marques Company,' and would give the Delegates a weapon with which they could force into bankruptcy a Company that hitherto had fulfilled all its engagements. / The very next day (17th May) the Minister for Foreign Affairs gave a Memorandum to the Deputation, by which the Portuguese Government bound itself to give the Dutch Company a tramway for the transport of railway material in case the Delagoa Bay Railway were not finished with sufficient speed to assure the commencement of the Transvaal Railway; and also to allow the tramway to be used for the transport of merchandise and passengers if the two Companies failed to arrive at a general tariff agreement.

These promises were of course in flagrant violation of the MacMurdo Contract, and the Portuguese Government used every endeavour to keep them secret. They did not communicate the Memorandum to the Portuguese Company, and they did not include it in the Portuguese White Book of 1885. Moreover, the
Memorandum was excluded from the Portuguese copy of a Convention of 1886, supplementary to the Treaty of 1875, while it was included in the copy of the South African Republic. A procès-verbal explained that this was done because the Memorandum, not requiring legislative sanction, had not been presented to the Chambers.

To the Transvaal Government, however, this engagement would have been useless for their ulterior ends had they preserved the same secrecy as the Portuguese, and they caused it to be spread about that they had received the promise of a tramway for all purposes. They thus on three occasions defeated the attempts of the Lourenço Marques Company to obtain money for their line.

The Portuguese Government, when appealed to to counteract these manoeuvres by stating the truth, declared that they were under no such engagement; and at last, under pressure from the Company, a Royal Decree was issued (25th July, 1886), which stated that the Company had the exclusive right to construct and work the railway; that no other Concession was in existence for the construction and working of any means of communication whatever across the district of Lourenço Marques; and that the Portuguese Government had made no promise of a Concession whose terms or conditions were or could be interpreted as contrary to any stipulation whatever of the MacMurdo Contract.

In 1885 the three years accorded to the Company for completing the line were by Royal Decree extended to four, on condition that the works were begun before June 1886. As this condition, thanks to the manoeuvres of the Boers, appeared to be impossible of realization, the Company, in May 1886, induced the Portuguese Government to begin the construction for them. In March 1887 the Company paid for and took over from the Government the work thus done on their behalf.

In February 1887 the Government drew up a Decree annulling the Concession, and showed it to the Transvaal Minister, assuring him that it would be executed shortly. It appears to have actually received the King’s signature in the following month, but was never promulgated. It was just at this moment that MacMurdo made his last and successful attempt to raise the necessary funds. This was done by forming an English Company – the Delagoa Bay and East African Railway (Limited) – whose legal position was that of a shareholder in the Portuguese Company, as the entire absorption of the latter would have entailed the forfeiture of the Concession.

In June 1887 work was actively begun on the line, and it was opened for traffic on the 14th December, 1888, the construction having been, according to the testimony of the Government engineer, Machado, carried out in the most satisfactory manner.

In March 1887 the Portuguese Government informed Van Blokland (the Transvaal Minister to Germany, Portugal, and Holland) that the Company was
now in a position to proceed with the construction, and that therefore they
could no longer pursue negotiations with other persons respecting the Conces-
sion. If the Transvaal had only been anxious for the completion of their own
line, this intelligence would of course have been satisfactory to them. But their
real aim being to secure possession of the Lourenço Marques line the news was
highly distasteful, and they expressed themselves in strong language, saying that,
rather than submit to English influence, they would prefer to join their line to
the Natal system.

Under this menace of cutting off Lourenço Marques from the interior, they
demanded either the immediate concession of a tramway, or a maximum tariff
for the whole ninety-nine years of the Concession. /

The Portuguese Government urged the South African Republic to submit
a tariff, which they engaged to recommend to the Lourenço Marques Com-
pany, and, after some remonstrance, they consented. The tariff, however, when
presented, proved to be a fresh move in their game. It provided for a division
of receipts on a kilometrical basis, by which, owing to the great length of the
Transvaal section as compared with the other, the latter could not have paid its
expenses, and therefore the Directors refused to entertain it.

The next device of the South African Republic to kill the railway was to pro-
pose that they should be allowed to make use of the Incomati River, and, by a
heavy expenditure, render it navigable up to the frontier. This was refused by the
Portuguese Government, as being in violation of the Concession.

In 1885, or possibly earlier, Machado discovered that he had made an error of
9 kilom. in his plans, the frontier being that distance further from Delagoa Bay
than he had imagined in 1882; but, though he informed his Government of this
at the time, and reminded them of it in 1886, no communication was made to
the Company to inform them that the plans already approved by Royal Decree
were incorrect.

Machado and the Boers, who had found means to attach him to their inter-
est by appointing him their railway surveyor, saw the advantage to be derived
from this fact, and in July 1887 he informed the Railway Company’s engineer at
Lourenço Marques that beyond the terminus of the line, as shown in the plans
already approved, a further section of 9 kilom. would be required to bring it up
to the frontier.

By the time the Contract for the completion of the line according to the
plans had been given out, and the work was in active progress. The Portuguese
Directors, on being informed of Machado’s communication, at once asked for
explanations at Lisbon, and, after careful inquiry, were informed in October that
nothing was known officially or unofficially at the Ministry of Marine on the
subject of the 9 kilom.
In November 1887 the Portuguese Government called the attention of the Company to the fact that the last section had still to be made; and the latter, while claiming that they had discharged their obligation under the Contract by constructing the line to the point marked ‘frontier’ on the approved plans, expressed their willingness to continue the line, but they pointed out that to do so, it was necessary for them to learn where the frontier was. They were informed, in reply, that the delimitation of the frontier was then the subject of negotiation with the South African Republic, whose claim in the matter was unacceptable to the Portuguese Government, and whose position was supposed to be connected with the railway tariff question; but that as soon as the frontier was settled, the Government would fix a reasonable period for completing the line.

In the negotiations that took place between Portugal and the South African Republic, the latter now showed their hand clearly. Until the Contract was annulled, or the tariff arrangement which they had propounded was forced on the Company, they refused to delimit the frontier, or to allow the Netherlands Railway Company to commence their section, and they threatened to close the Komatie poort, so as to deprive the Lourenço Marques line of any chance of traffic from the Transvaal. They also suggested to the Portuguese Government that the non-completion of the 9 kilom. gave them a lever to force the Company to submit to their terms.

On the 10th March, 1888, Bok, the Transvaal Secretary, wrote that his Government expected the Portuguese Government to do all in their power to compel the Company to come to a tariff arrangement, or to forfeit the Concession; adding ‘it is unnecessary to assure your Excellency that if your Government incurs any pecuniary sacrifice in connection with annulling the Concession, this Government is ready to bear its just share. . . . I am instructed to assure your Excellency that this Government guarantees the exact performance of the conditions of the railway Concession in case of its being withdrawn from its present holders.’

The demands of the South African Republic were pressed with increasing energy, until at last on the 23rd June, 1888, Van Blokland telegraphed to the Dutch Consul-General at Lisbon to inform the Ministry that the South African Republic ‘insisted’ on either the tariff, or / forfeiture of the Concession, or a grant of the Tramway Concession, and demanded a categorical reply. On the 26th June the Minister of Marine wrote to the Minister of Foreign Affairs, showing reasons why none of these courses would be equitable at the present time; but on the 28th June the latter informed Van Blokland that the Portuguese Government were ready to demand from the Company the immediate construction of the line to the frontier, and the acceptance of the tariff demanded by

* The gorge through which the line passes as it crosses the frontier.
the South African Republic, if the latter, on their side, would engage to fix the frontier according to a Convention already proposed.

The Company having refused to accept the tariff, a Royal Decree was issued on the 24th October, 1888, ordering the Company to complete the line to a terminus in the Incomati poort within eight months. The Company protested that this would be impossible, as the period included the rainy season from November to May, during which it would be impossible to work, but their protests were met by new and more peremptory Decrees confirming the first.

To add to their difficulties unusually severe floods occurred in January 1880, which not only proved that Machado’s plans for the last section were impracticable, but also swept away portions of the line already opened. This, of course, should have been regarded as a case of force majeure under the Contract, and, moreover, the Portuguese Directors were privately assured by the Minister of Marine that if the Company showed its desire to fulfil the Contract by commencing the work, they would undoubtedly be granted a prolongation of the time. Relying on this, the Company sent out the necessary plant and began work even before the end of May, and they used the utmost efforts to get a three months’ prolongation. In this they were supported both by the United States’ and by Her Majesty’s Government, who warned the Portuguese Government that to refuse to extend the time, or to arbitrate under the arbitration clause of the Contract, would be regarded as ‘a very serious step.’ The Portuguese Government, however, were deaf to all remonstrance, and on the 25th June, 1889, the eight months having expired on the previous day, they seized the railway with an armed force, and annulled the Concession by Royal Decree.

The British Company appealed to their Government for redress. The Law Officers (Sir R. Webster and Sir E. Clarke), as well as Sir Charles Russell, Sir H. James, Sir Horace Davey, and Mr. Underwood, were unanimous in their opinion that the conduct of the Portuguese Government was unjustifiable; and the Law Officers considered the case so clear that they advised Lord Salisbury to refuse to admit any question as to the right of Portugal to make the seizure. They also considered that the claim of the Company to receive 1,000,000£ in respect of its capital was not unreasonable.

A passing reference may be made to the composition of the Portuguese Board, who resigned in a body as soon as Her Majesty’s Government intervened in the matter. The first President was M. Serpa Pimentel, an ex-Minister. He was succeeded by M. Chagas, the Minister who had given the Concession to MacMurdo, and who, up to the date of the seizure, vigorously upheld the interests of the Company, but who, two days after he had resigned, publicly approved the policy of his Government from his place in the Chamber. Another Director was M. Ressano Garcia, who resigned to become Minister of Marine, and four
months later drew up the ‘Exposé des Motifs’ and the Royal Decree annulling the Concession.

None of the Portuguese Directors appear to have paid anything for their qualifying shares, and some of them appear to have made considerable profit by selling the shares presented to them by MacMurdo. It is interesting to observe that in May 1887 Baron de Costa-Ricci, the Financial Agent of the Portuguese Government in London, writes to MacMurdo to ask when he may expect the realization of his spontaneous and generous promise to give him 200 shares in the British Company. (Répl. Angl., p. 159.)

Demands for reparation were made to the Portuguese Government by Her Majesty’s Government on behalf of the British Company, and by the United States on behalf of the widow of MacMurdo, who had died in May 1889.

The Portuguese at first refused to treat with, or to recognize, any one save the Portuguese Company; but at length they gave way, and agreed to submit to the arbitration of three Swiss jurists the question of the amount of the indemnity for which they were liable.

On the 8th August, 1890, the Swiss Government were asked to select the Arbitrators, and on the 17th September they selected MM. Blaesi, Heussler, and Soldan. After considerable correspondence between the three Governments, the terms of reference were finally settled on the 13th June, 1891.

On the 5th March, 1892, the Rules of Procedure were promulgated.

On the 2nd April, 1892, the British Case was filed. The Portuguese Counter-Case should have been presented by the 22nd July, but they obtained extensions of time to the 31st December.

The British and United States’ replies were to be filed by the 31st March, 1893, but owing to the length of the Portuguese Case and to other causes, the British claimants were not able to send in their reply till the 10th November, 1893. The Portuguese rejoinder was presented on the 14th November, 1894. The Tribunal then required each side to file a list of the essential facts of its Case, and the points on which it considered that oral or expert evidence should be taken; and this was done in August last.

The further action of the Arbitrators has not yet been reported, but they have to decide what evidence they will receive, and after this has been taken Counsel will address them, so that it is clear that the Award will not be given for some time to come.

The British claim is for 1,138,500 l. and the American for 760,000 l., plus, in each case, interest from the 25th June, 1889, and costs. Thus, the combined claims considerably exceed 2,500,000 l. The Portuguese, on the other hand, estimate the value of the line at about 163,000 l., from which they make deductions sufficient to bring in the Company as in their debt to about 100,000 l., without
taking into account the ‘material and moral prejudice’ caused to them by the Company’s misdeeds.

The position of the British and United States’ Governments in the arbitration is not identical. The former have confined their action to bringing the English claimants in regular form before the Tribunal, so that they may state their case. The United States’ Government at first proposed to appear directly as claimants, but Lord Salisbury induced them to adopt a line more in harmony with his own.

The bonds and shares owned by MacMurdo’s widow were held (as security apparently) by creditors of MacMurdo’s estate; and the English Company asked that the whole of the sum awarded might be handed to them for due and proper distribution. Mr. Blaine absolutely refused to go on with the arbitration on such terms, and at length a compromise was arranged by which MacMurdo’s creditors deposited their bonds with the United States’ Minister in London on an assurance that the United States’ Government would set aside an equitable portion of the Award to be dealt with as part of MacMurdo’s estate, the other portion being reserved for the personal benefit of his widow.

It has already been stated that one of the conditions of the MacMurdo Contract was that if the Company failed to complete the line and the Portuguese Government stepped in, the Concession should be put up to auction on the same terms, and the sum realized, less the expenses of the Government, should be paid to the Company; and the Royal Decree of the 25th June, 1889, which rescinded the Concession, gave directions accordingly. It is evident that had this condition been fulfilled, it would have enabled the Company to recover their property; for they would have been able, under these circumstances, to outbid any other competitor. But the condition was never carried out, partly because (as is believed) of foreign pressure, and partly because the Portuguese Government speedily put it out of their power to put the Concession up to auction ‘on the same conditions.’

For in August 1889 Van Blokland* appeared once more at Lisbon, and departed in a few days after accomplishing his Mission, which was to arrange a permanent tariff over the Transvaal and Portuguese sections of the line.

On the 4th September, 1889, a Tariff Arrangement / was signed between the Minister of Marine as representing the Lourenco Marques Company and Mr. Ernest George, the Transvaal Consul at Lisbon, the terms being practically those which the Delagoa Bay Railway Company had refused, including a kilo-

* As an evidence of what reliance is to be placed on Van Blokland, it may be mentioned that on the 6th July, 1889, he assured our Minister at the Hague that since the 17th May, 1884, the date of the secret engagement, the Transvaal Government had ‘been parties to no further transaction in connection with this affair.’ For a long time, Sir Horace Rum- bold seems to have been completely deceived as to the real attitude of Van Blokland and the Dutch Government.
metrical division of receipts, by which, as shown above, the Transvaal Company can, if necessary, deprive the Portuguese section of all chance of profit. This being settled, the Transvaal, who had hitherto forbidden their concessionnaires, the Netherlands South Africa Railway Company, to commence work, caused their section to be pushed on with all speed. The Portuguese Government, on their side, finished the last section of 9 kilom. (at extravagant expense), and the whole line from Pretoria to Delagoa Bay was completed before the end of 1894, although the formal inauguration did not take place till July 1895.

Before leaving this portion of the subject, it is necessary to mention a correspondence that took place in 1888 between the South African Republic and Her Majesty’s Government with reference to the railway.

On the 26th May, 1888, President Krüger telegraphed to Sir Hercules Robinson to ask if Her Majesty’s Government were willing to declare that they had no intention to buy or acquire the Delagoa Bay Railway, or the controlling power in the railway or in MacMurdo’s Company; and that they had no intention to oppose or counteract the Transvaal Government with regard to the railway. He gave as his reason the belief that MacMurdo, strengthened by the hope of support from Her Majesty’s Government, would refuse to agree in the tariff question.

Sir Hercules Robinson advised that the President be informed that Her Majesty’s Government would give the assurance desired, if the Government of the South African Republic would state that they had no intention to impose duties on imports by colonial routes other than those imposed on imports by the Delagoa Bay route.

By clause 39 of the Netherlands South African Railway Company’s Concession, the Transvaal Government had engaged to levy no duties on goods imported by the Delagoa Bay line. The Law Officers were at this time being consulted as to whether this engagement was a breach of the XIIIth Article of the London Convention securing most-favoured-nation treatment for British imports, and they reported favourably to our view.

On the 16th June Sir H. Robinson was empowered to give the assurance asked for, as far as the words ‘in MacMurdo’s Company’ on the conditions suggested by him, and without prejudice to our position under the Convention, in case our offer was not accepted. The rest was considered too vague to be the subject of a declaration by Her Majesty’s Government.

On the 19th and 22nd June President Kruger gave the assurance that the South African Republic had no intention to impose duties on imports by colonial routes other than those imposed on imports by the Delagoa Bay line, and stated that the Railway Company had agreed to cancel Article 39 of their Concession.
He did not add that the Railway Company were compensated by receiving, instead of this, the amount of all the duties collected on goods coming in by their line.

II. – The British Rights in connection with the Province of Lourenço Marques and the Railway.

In 1875, when the MacMahon Award (respecting the southern portion of Delagoa Bay and territory to the south thereof) was about to be given, Her Majesty’s Government proposed to the Portuguese Government to make an Agreement that ‘the Power in whose favour the Award is made will not entertain any proposal for the acquisition of the said territory by any other Power until the defeated claimant shall have had an opportunity of making to the successful claimant a reasonable offer for the acquisition of that territory, either by purchase or for some other consideration.’ The Portuguese Minister gave in return ‘the fullest assurance as to the determination of the Portuguese Government of not ceding to any third Power the territory the possession of which may be secured for it in virtue of the arbitration.’ In acknowledging this assurance, Lord Lytton referred to it as one ‘not to cede or sell to any / third Power . . . without having previously given to Her Britannic Majesty’s Government the opportunity of making a reasonable offer for the purchase or acquisition by other arrangements satisfactory to Portugal of the territory thus awarded.’

In 1886 Sir Geo. Petre was instructed to obtain a renewal or confirmation of this assurance. Senhor Barros Gomes told him that, even before referring to the correspondence of 1875, he ‘could at once give the most positive and unqualified assurance that the Portuguese Government had not the remotest intention of ceding Delagoa Bay on any consideration,’ and that Portugal ‘would scrupulously and loyally abide by whatever engagement she had entered into with Great Britain on this particular question as on all others.’ Subsequently Sir G. Petre reported, in a despatch dated the 8th January, 1887, that Senhor Barros Gomes, after referring to the correspondence of 1875, had given him ‘an unqualified assurance that the Portuguese Government considered that engagement as a binding one.’

On the 11th June, 1891, a Treaty was concluded between Great Britain and Portugal for the purpose of settling the grave questions that had arisen between the two Powers in Africa.

Article I defined the Portuguese territories north of the Zambezi; Article II those south of the Zambezi; Article III allowed the Portuguese to extend their sphere of influence south of Delagoa Bay as far as a parallel following the confluence of the Maputa and Pongolo to the sea; and Article VII, after a reference to Articles I to VI, provided in its second paragraph that ‘the two Powers agree that in the event of one of them proposing to part with any of the territories to the
south of the Zambezi assigned by these Articles’ (*i.e.*, I to VI) ‘to their respective spheres of influence, the other shall be recognized as possessing a preferential right to the territories in question, or any portion of them, upon terms similar to those proposed.’

Our rights as against the South African Republic are defined by Article IV of the London Convention of 1884, which is as follows:–

‘The South African Republic will conclude no Treaty or engagement with any State or nation other than the Orange Free State, nor with any / native tribe to the eastward or westward of the Republic, until the same has been approved by Her Majesty the Queen. Such approval shall be considered to have been granted if Her Majesty’s Government shall not, within six months after receiving a copy of such Treaty (which shall be delivered to them immediately upon its completion), have notified that the conclusion of such Treaty is in conflict with the interests of Great Britain, or of any of Her Majesty’s possessions in South Africa.’

The interpretation placed by Her Majesty’s Government on these stipulations will be most conveniently shown in the next section; but it may be observed here that the above-quoted Article VII was not accepted by the Portuguese without demur, and that Lord Salisbury, while refusing to abandon it, gave it a reciprocal form in order to spare their susceptibilities as much as possible. The Portuguese fought hard against our demands on this and other points, and instructed their Representatives abroad to invoke the intervention of the Powers,* but without success. When matters seemed at a deadlock the German Ambassador unofficially tendered his good offices to Lord Salisbury, ‘not because Germany had any interest in the questions at issue,’ but for reasons of international policy. He obtained a copy of the draft Treaty from the Portuguese, and offered to Lord Salisbury certain comments upon it;† but he does not appear to have made any reference to Article VII. It may be important to bear this in mind hereafter.

III. – Negotiations with Portugal respecting the Railway, the Attitude of Foreign Powers, and the Action taken by Her Majesty’s Government in consequence.

In October 1891, Van Blokland was again at Lisbon endeavouring to negotiate for a sale of the railway. Great secrecy was observed by the Portuguese, but our Minister (Sir G. Petre) managed to ascertain from private sources that although they had not definitely agreed to the principle of a sale to the Transvaal, they had got so far as to discuss the price to be given in the event of such a sale. The Portuguese demanded / 2,222,000l., while the Transvaal would not go beyond 1,777,000l., and the negotiations were left at this stage, with the understanding that they were to be regarded as merely suspended.

* Vide Portuguese White Book IV of 1891.
† Vide Marquess of Salisbury to Sir E. Malet, May 1, 1891.
So long ago as 1887 the Cape Government had been anxious to approach Portugal with a view to the cession of Delagoa Bay, but the Foreign Office threw cold water on the proposal, and it was not pursued. In 1891 Mr. Rhodes took up the idea, his view being that Her Majesty’s Government should act as principal in the matter, being secured by a Cape guarantee; and between January and March 1802, Lord Rothschild was moving in concert with the Cape Government for the purchase of all the Portuguese possessions south of the Zambezi.

The Portuguese, while declining to sell, hinted at a lease, and M. de Soveral even told Lord Rothschild that, with a little patience, we should have an offer made to us.

In April 1892 Mr. Rochfort Maguire went to Lisbon on behalf of Mr. Rhodes to sound the Government as to whether they would negotiate with the Cape for an arrangement respecting the Province of Lourenco Marques; but he appears to have come back with the conviction that the Portuguese would not accept the Cape or any Government as lessees. Moreover, the number of offers then before the Portuguese Government would have led them to form an exaggerated idea of the value of their territory, and to demand an impossible price; for besides the Transvaal and Lord Rothschild there was a private Syndicate, composed of Messrs. Isaacson and Baumann (M.P’s.) and others who were also after the Concessions, and Sir John Pender was negotiating, on his account, as an unauthorized agent of the Cape.

Another consideration that must have weighed with Portugal, both then and since, was that the United States had warned them that the railway must not be disposed of pending the Award, as it was practically the only asset which could be utilised for payment.

In December 1892 Mr. Rhodes renewed his attempt, this time through Baron Merck, a German financier, in whom Sir G. Petre had full confidence. The Baron, who enjoyed the support of Lord Rothschild, was semi-officially informed in January 1893 that the Portuguese were willing to receive a firm offer, and that there was every chance of success if time were not wasted. He was nearly certain that they would accept a Company in return for payment of 600,000£ in cash, payment of the Award, and 40 per cent. of the profits. Time was, however, lost in consulting Sir J. Pender and others; and though Sir J. Sivewright, on behalf of the Cape, authorized him to offer 600,000£ in cash for the Concession, the bid, when made in the following February, proved insufficient. At this time there were no less than four competitors at Lisbon, the others being: (1) a party of Boers headed by Isaac Lewis (of the firm of Lewis, Marks, and Co.); (2) Van Laun, acting through a Belgian agent named Van Closen, who was said to have offered 80,000£ in bribes, and pretended to be acting on behalf of the Transvaal; and (3) the Transvaal Government through Van Blokland. But
the Portuguese Government told all applicants that they intended to do nothing pending the Award.

On the 10th March, 1893, Mr. Rhodes telegraphed (probably on information derived from Baron Merck) that the Transvaal, backed by Germany, were in the field as purchasers of the line; that every effort should be made to prevent this; and that his colleagues assumed all responsibility of purchase. On inquiry, it was found that the Transvaal Agents had left Lisbon, and therefore no representation was made to Portugal. Subsequently, Mr. Rhodes repeated that the Cape Government were prepared to purchase the line.

In the meanwhile, Lord Rosebery's views as to the rights of Great Britain in the matter had undergone material development. On the 11th October, 1892, he informed the Delagoa Bay Railway Company that he did not see that the pending arbitration gave Her Majesty's Government any right to object to the alienation by Portugal of her rights over the district of Delagoa Bay; and on the 21st December he wrote privately to Sir H. Loch that as long as Portugal retained her sovereignty he could not see what right of intervention we possessed.

On the 23rd March, 1893, the Law Officers (who had been consulted as to the bearing of the Agreement of 1875 on the question) reported that a Concession to the South African Republic of the right to levy customs duties in Lourenço Marques, while not a cession of the territory, is / clearly the cession of a sovereign right in relation to it, and clearly goes to lessen its value; that it was therefore against the spirit of the Agreement of 1875, and might properly be made the subject of remonstrance.

On the 29th March, Sir H. MacDonell was accordingly instructed to inform Portugal that Her Majesty's Government would not recognize or allow any alienation of a sovereign right (such as customs rights) in the Delagoa Bay territory without giving previous notice to Her Majesty's Government, and affording them an opportunity of acquiring it.

On the 5th May, 1893, the Portuguese Minister informed Lord Rosebery that he had not the slightest apprehension of any sale to the South African Republic during the arbitration, and Lord Rosebery intimated, in reply, that if this were done ‘we should be compelled to take our own measures for protecting our own position.’

Sir H. Loch having pointed out to Lord Rosebery that Article VII of the Treaty of 1891 had a more important bearing on the question than the Agreement of 1875, which only applied to a small portion of Lourenço Marques, his Lordship in July 1893 sent a Memorandum to Sir H. MacDonell, for his own information, explaining the views of Her Majesty's Government as to the applicability of that Article to the question of the concession of sovereign rights in Delagoa Bay territory. His conclusion was that, in the event of Portugal propos-
ing at any time to part with any of the territories to the south of the Zambezi assigned by Article II to be within the sphere of her influence, Portugal would be bound by Article VII to recognize Great Britain as possessing a preferential right to the territories in question, or to any portion of them; but he did not intend to claim this preferential right in respect of the territory named in Article III.

[It is not easy to imagine what induced Lord Rosebery to make this limitation, which might have had most unfortunate effects, as Article III is one of the Articles to which Article VII applies, and the territory concerned is precisely that on which the Boers have designs. The point is of less importance, as the Memorandum was sent for private information, but it might be well to warn the British Minister that Lord Salisbury does not adopt his predecessor’s view in this respect – if such be the case.]

In March 1894 the Portuguese Minister for Foreign Affairs (Senhor Arouca) informed Sir H. MacDonell confidentially that the Netherlands Minister had approached him confidentially on behalf of intending Dutch purchasers of the Delagoa Bay Railway, but that he had replied that the Portuguese Government would entertain no proposals before the Award.

In April 1894, by desire of Mr. Rhodes, Sir H. Loch (who was then in this country) was in communication with Lord Rothschild on the subject of the railway. Lord Rothschild was certain that Portugal would not sell, but thought they would lease the railway for 100 years if a firm offer were made, and he suggested that his firm should be authorized to negotiate on the basis of paying the Award (which he estimated at 1,250,000£), besides payment for the lease, say, 400,000£, or possibly more. He would not mention the Cape Government in his negotiations. Sir H. Loch telegraphed to Mr. Rhodes, suggesting that he should first offer to lease the whole province, and, if that failed, he should propose to lease the railway. On the 5th May Mr. Rhodes replied that Lord Rothschild should intimate that he was prepared to make an offer when the fitting moment arrived. On the 16th May the Cape Government sent a further telegram, intimating that they would prefer to await the Award, but that Lord Rothschild might meanwhile find out the Portuguese terms; and nothing more definite could be got from the Cape.

In connection with this suggestion to lease the province, it may be observed that before any arrangement of this kind could be concluded, it would be necessary to know exactly what Portugal still has the power to sell. She had already practically assigned to Companies (the chief of which is the Mozambique Company) the administration of all her territories between the Zambezi and Lourenço Marques, and on the 26th October, 1893, a Concession over the northern half of that province was granted by Royal Decree to Senhor Diogo Conto and Captain Vasconcellos. It assigned to them all the territory between the Limpopo, the Transvaal, and the Incomati River, for the purpose of developing the mining and agricultural resources of the district, and it included the
power to make railways. In December 1893 Sir H. MacDonell protested to the Portuguese Government against the conditions of this Concession, as impairing the value of the MacMurdo Concession, but it does not appear that his protest had any effect. It has also been stated that a Boer holds the Concession of a strip of land in the south of the province (the Catembe district), running right across from the Transvaal to Delagoa Bay, and there may be other Concessions granted to Boers or Portuguese of which we know nothing.

On the 10th May, 1894, our Minister was informed privately by the Prime Minister (Senhor Hintze Ribeiro) that he had lately had a proposal from a group of Dutch financiers, apparently acting on behalf of the Transvaal, who were evidently backed up by the Dutch Government. They offered to guarantee the whole amount of the Award whatever it might be, and to share equally with the Portuguese Government whatever profit might be derived from working the line at the present rates. They proposed to leave Portugal in nominal possession of the railway, but claimed the exclusive fiscal control of it, and the right to carry out such improvements as they might deem necessary. According to the Prime Minister, they were informed, in reply, that the Portuguese Government were determined to listen to no proposals whatever touching the acquisition of the railway or harbour.

On the 28th August, 1894, Sir H. MacDonell reported the substance of further information confidentially communicated to him by the Prime Minister. When Van Blokland last visited Lisbon, ostensibly to negotiate an Extradition Treaty, he made several attempts, in concert with the Netherlands Minister, to induce Portugal to come to a tacit understanding with regard to the railway and a port improvement scheme, but the Portuguese categorically refused pending the Berne Award. Shortly after the Netherlands Minister introduced two Dutch financiers, who proposed to assist Portugal in her financial troubles, but in all the plans which they put forward the railway and a port improvement scheme were among the guarantees to be provided, and the Portuguese refused to negotiate on this basis. The German Minister then stepped in, and, by desire of his Government, urged Portugal not to break with these financiers, as they alone could extricate her from her difficulties. The Portuguese Government, however, held firm, and secret inquiries showed that one of the ‘Dutch’ negotiators was a Director of the Bank of Darmstadt (an institution enjoying influential support in Germany), which would thus have financed the scheme.

On the 15th September, 1894, Sir H. MacDonell informed Senhor Hintze Ribeiro that Her Majesty’s Government felt confident that the Government of Portugal accepted the clear understanding that no action will be taken by them without previous reference to Her Majesty’s Government in regard to granting any Concession or privileges connected with Delagoa Bay, even after the delivery of the Berne Award. To this he at once demurred, saying that if he continued
at the head of the present Administration, he would make it a point not to act in the matter without their cognizance after the Award had been given, but he could not pledge the Portuguese Government to a line of action which his successors and the Chambers might not approve. Germany, Holland, and the Transvaal had been urging him incessantly, claiming the right that they should be consulted in shaping their course, if the Award should be in favour of Portugal, and holding out every inducement in the shape of material assistance should the verdict be unfavourable. He had invariably replied in the same sense – no decision at present, and no engagement for the future.

Sir H. MacDonell reminded him of the Portuguese engagements with Great Britain, and said that if Portugal regarded England as being on the same footing in the matter as Germany, Holland, and the Transvaal, he begged him to take note of his declaration that Her Majesty’s Government expected that the King’s Government would take no action in the matter, even after the Award had been delivered.

Senhor Lobo d’Avila, the Minister for Foreign Affairs, took the same line as the Prime Minister, but was more unequivocal in his assurances that the Portuguese Government would eventually act in concert with Her Majesty’s Government in the railway question.

On the 19th September the British Minister delivered a note to Senhor Lobo d’Avila, stating that, in accordance with the Agreement of 1875, Her Majesty’s Government had the right to claim that previous notice should be given them, and an opportunity afforded them of acquiring such rights as the King’s Government may have it in contemplation to dispose of in Lourenco Marques.

On the 2nd October, Lord Kimberley pointed out to Sir H. MacDonell that the Agreement of 1875 only referred to the territory in respect of which the MacMahon Award was given, and would, therefore, not include the railway and port of Lourenco Marques; but under Article VII of the Treaty of 1891, ‘it is not open to Portugal to alienate territory south of the Zambezi to a third Power, and Her Majesty’s Government holds that the Article also precludes her from parting with rights now existing in that territory which would in any way diminish the value of the preferential claim of this country.’

During the native rising at Lourenco Marques in the autumn of 1894, 400 Transvaal Volunteers offered to proceed to Delagoa Bay to restore order. We know from Sir J. de Wet that this offer was approved, if not inspired, by President Kruger, and it was accepted by the Minister of Marine, but the Portuguese Government cancelled the acceptance in consequence of a private, but energetic, protest by our Minister. Van Blokland had previously made an official tender of assistance on the part of the Transvaal Government, but this was declined.
On the 18th October, 1894, Senhor Hintze Ribeiro made a statement in the House of Peers that the Government were firmly resolved not on any account to surrender the administration of the railway.

On the 19th October, Mr. Gosselin was confidentially informed that the Political and Colonial Directors in the German Foreign Office had stated that their Government could never agree to Delagoa Bay, or any other of the Portuguese possessions on the East African Coast, falling under the control of Great Britain; that German East Africa was already hemmed in on the north by the British sphere, and that it was of vital importance that a similar bar should not be placed to a possible future extension of the German sphere of interest on the south.

On the 27th October, Sir H. MacDonell reported that the German Minister had lately communicated a confidential Memorandum to Portugal on the Delagoa Bay Railway, which dwelt in emphatic terms on the concern which Germany / claims to feel in this question, and expressed the urgent desire that immediately on the Declaration of the Berne Award the German Government should be the first to be taken into the confidence of Portugal, with a view to combined action. According to the Portuguese, no reply was given to this communication.

On the 31st October, Count Hatzfeldt told Lord Kimberley that he had informed Lord Salisbury (in 1890 or 1891?) that in the event of a break-up of the Portuguese dominions in East Africa, Germany could not consent that they should become British possessions, as the result would be that the German Colony would be almost completely shut in by British territory. Lord Kimberley declined to discuss what might happen in such a case, but pointed out that we should, under our Treaty of 1891, have a preferential right to Portuguese territories south of the Zambezi.

In November 1894, Sir H. MacDonell was informed by Senhor Lobo d’Avila that the Netherlands Minister had pressed him on behalf of his own Government and of the Transvaal to come to some distinct understanding, in anticipation of the future, with regard to the railway, adding that Van Blokland was prepared to come to Lisbon with carte blanche to arrange any conditions in the shape of men or money, to enable Portugal to counteract the designs of the British Government on Delagoa Bay. Senhor Lobo d’Avila had replied that Portugal was determined to maintain the status quo in Lourenço Marques, and required no financial or other aid from the Transvaal or elsewhere to accomplish that object.

On the 17th November, 1894, Baron von Marschall informed Mr. Gosselin that Germany desired a maintenance of the status quo, both politically and commercially, so that the railway, pier, and harbour should remain in Portuguese hands; for the Germans had great commercial interests in the South African Republic, and could not allow foreigners to absorb those undertakings, He especially alluded to the possibility that the Cape might seek to bar the access of the Transvaal to Delagoa Bay.
In the previous month Sir H. Loch had returned to South Africa, bearing with him Lord Ripon’s instructions as to certain alterations in the London Convention, which President Krüger was understood to desire. He was permitted to assent to a modification of Article IV, but, in view of the position taken up by Germany, a telegram was sent to him on the 29th November, directing him not to initiate any discussion on the subject, and to refer the matter home if the President raised it. At this time, the German Colonial Society and newspapers of all shades of political opinion were urging their Government to take steps to counteract British designs on Delagoa Bay, and to uphold the independence of the Transvaal; and Baron von Marschall was repeatedly alluding to the bay in his conversations with our Charge d’Affaires, in a manner which indicated an intention on the part of the German Government to make their influence felt in South-East Africa.

On the 21st November, the Portuguese Prime Minister observed to Sir H. MacDonell that in any arrangement with regard to the railway, it would be necessary, in view of the attitude recently assumed by Germany, to be very careful to avoid anything which would involve even the appearance of any change in the political status quo; and our Minister expressed his concurrence in this view.

It may here be explained that under their arrangement with Portugal, the Transvaal Government have built a pier at Delagoa Bay for the exclusive purpose of landing railway material for their own lines. When no longer required for this purpose, the pier is (I believe) to revert to the Portuguese Government on payment of its cost; but the Transvaal have acquired land all round it, and evidently wish to establish a vested right in it. The Portuguese are at the present moment negotiating for its purchase for shipping purposes; but they are not prepared to pay the price asked for it, and the negotiations, which seem to have given rise to some friction, are not yet concluded.

In December 1893, the Transvaal had been pressing Portugal to give them permission to erect a jetty for landing and shipping, but the Portuguese had stoutly refused. A Concession had been given to one Cohen (apparently the former Portuguese Consul at Pretoria) for a landing pier, and in December 1894 Mr. Sawyer (who had executed work on the railway for the Portuguese Government) applied to Sir H. MacDonell for an introduction to Senhor Hintze Ribeiro in connection with this pier Concession, which Cohen was transferring to Mr. Lewis. Mr. Sawyer represented it as a genuine Anglo-Portuguese undertaking, and in opposition to the Netherlands Railway Company; but knowing the intimate relations of Messrs. Lewis and Marks with President Krüger, Sir H. MacDonell was suspicious. He, however, took Sawyer to the Prime Minister, who, after hearing what he had to say, replied that the Portuguese Government were quite aware of the plans and intentions of the Transvaal Government and those who side with the Netherlands Company, but were prepared to stand by
their rights, and would not interfere with the status quo, whatever the neig-
bouring State might say or do as regards the railway and port. On this Sawyer
said that he would advise Mr. Lewis to abandon the scheme altogether; but it
was ascertained that he afterwards interviewed the Minister of the Colonies,
and telegraphed to Lewis to legalize his contract with Cohen. I understand that
Cohen is still working at Lisbon to get approval of his plans for putting his Con-
cession into force, but that so far he has not succeeded.

At this time, the Portuguese Government seem to have been convinced that
the Transvaal had endeavoured to use the native rising at Lourenco Marques for
the furtherance of their political designs; and they removed their Consul from
Pretoria on suspicion that he was connected with the false reports sent from
the province to England and Germany by agents acting in connivance with the
Transvaal authorities.

On the 24th January, 1895, Sir H. MacDonell observed that there could be
no manner of doubt that both in Portugal and in the South African Republic the
conviction universally prevailed that Germany, Holland, and the Transvaal were
acting in concert with a view to secure a footing in Delagoa Bay.

On the 26th January Sir E. Malet,13 in conversation with Baron von Mar-
shall, remarked that he could not understand why Germany should show a
tendency to coquet with the Transvaal, when they must be aware of our extreme
dislike to it. Baron von Marschall replied that they were bound to protect Ger-
man interests, that the railway from Delagoa Bay to the Transvaal was made with
German and Dutch capital,* and that it was the only outlet [sic] for the com-
merce of the Transvaal with which German trade was increasing. Sir E. Malet
answered that the railway was in no way menaced, and that Her Majesty’s Gov-
ernment were determined to maintain the status quo. Baron von Marschall said
that he was well aware of the Treaties between Great Britain and the Transvaal,
and that there was no thought of doing anything which could have any political
significance, or to exercise in any way political influence in the Transvaal. Finally,
Sir E. Malet begged Baron von Marschall to remember that the whole question
was one on which we were peculiarly sensitive.

The celebration of the German Emperor’s birthday at Pretoria was marked by
some very effusive utterances on the part of President Krüger; and in connection
with this, Lord Kimberley wrote privately on the 30th January to Sir E. Malet,
suggesting a friendly reminder to the German Government that Article IV of the
London Convention prevented any Treaty of Alliance between the South African
Republic and any other Power without our consent, and that it was a stipulation
which we should enforce. He was also to point out that as we are agreed to main-

* Probably Sir E. Malet misunderstood him. This is, of course, only true of the Transvaal
section of the line.
tain the status quo in those parts of Africa, it was most important that nothing should be done or said which could awaken suspicion as to German action in the Transvaal. Public opinion both here and in South Africa was extremely sensitive on the point, and nothing would more prejudice a good understanding with Germany than any belief that she was attempting to lay the ground for interference in the affairs of the Transvaal. Lord Kimberley by no means credited the various rumours which reached him on the subject, but he would not be frank if he did not say that they had caused us some anxiety. This letter was read by Sir E. Malet to Baron von Marschall during an animated interview, in which the latter used strong language about Mr. Rhodes, whose recent utterances about Germany and the Transvaal, as reported by a ‘Kreuz Zeitung’ interviewer, had given violent offence in the former country. At a subsequent interview Baron von Marschall was more conciliatory, and authorized our Ambassador to assure Lord Kimberley that there was no sort of alliance between Germany and the Transvaal, that their relations were purely commercial, and not political.

On the 19th February, Lord Kimberley wrote to Sir E. Malet that as he had read to Baron von Marschall this private note, he might explain that in speaking of the status quo he referred to the friendly understanding which exists between Great Britain and Germany to do nothing to impair the authority of Portugal over her possessions in South-East Africa, and that he had no intention of referring to the South African Republic, as Her Majesty’s Government could not enter into any engagements which would interfere with the development of commercial relations between the Transvaal and the British possessions in South Africa.

In May last, a report appeared in the public press that 500,000l. had disappeared from the Treasury at Pretoria, and had been remitted to Lisbon in connection with the purchase of the Delagoa Bay Railway, and it was insinuated that part of the money was intended to bribe the press and public men in Portugal. The Portuguese Government instructed M. Soveral to publish an indignant protest against these imputations, but they received at least partial confirmation from Sir J. de Wet, the British Agent at Pretoria. The Treasurer-General of the South African Republic informed him confidentially that this 500,000l. had been remitted to Lisbon, where a Transvaal Deputation then was, and plainly intimated that part or the whole of the money must be intended to be spent in bribery to gain the support of powerful influence with the Portuguese Government. At a later date (29th July), Sir J. de Wet reported that a portion of the money had already been spent, and that the Government refused, even in secret session of the Volksraad, to say what had been done with it, on the ground that to do so would be prejudicial to the negotiations.

On the 9th July, in connection with these rumours, Lord Salisbury instructed Sir H. MacDonell to refer the Portuguese Government to the assurances given by them in 1893 and 1894, that no engagement would be entered into pending
the Award, and to say that it would be quite satisfactory / to Her Majesty's Gov-
ernment that Portugal should retain the railway in her own hands, but that they
would regard any steps in respect to an arrangement which would give to any
other Power direct or indirect control over the railway as inconsistent with the
understanding that the status quo should be maintained. Any engagement which
would transfer to a third Power rights in the Province of Lourenço Marques
which now belong to Portugal, including rights over the ports, railways, or cus-
toms, would amount to a cession of sovereign rights, and would be inconsistent
with the spirit of the Agreement of 1875 and of Article VII of the Treaty of
1891, and would, therefore, not be recognized by Her Majesty's Government.

On the 22nd July, Senhor Lobo d'Avila replied that the Portuguese Govern-
ment neither have, nor have ever had, any intention of alienating any part of
their colonial territory; that while the arbitration is pending they consider it
their duty to abstain from any act that may alter the state of the question as it
was submitted to the Tribunal; and that, with respect to the future, they had not
entered into any engagement.

On the 12th August, Lord Salisbury pointed out, in reply, that this note did
not cover the future of the railway after the Award. He instructed Sir H. Mac-
Donell to insist on the fact that Her Majesty's Government hold that Portugal
has no right to diminish, in favour of any other Power, the value of the territ-
ory in regard to which Great Britain has the right of preemption, and that they
maintain the view that – while the cession of land on which the railway stands,
or which is connected with it, or of any Government land, however limited in
extent, would be unquestionably an alienation of territory inconsistent with the
right of pre-emption – a Concession giving powers over the railway or over such
land would equally be an infringement of the preferential right of Great Brit-
ain. He was to make it clear that the time has arrived when it is essential that it
should be understood that the two Governments are agreed in this interpreta-
tion of the Convention of 1891.

On the 21st August, the Portuguese Minister verbally informed Lord Salis-
bury that Portugal had not the slightest intention of ceding their rights over the
railway to the Transvaal or any / one else, and would not allow it to be bought
by any one.

On the 30th August, Sir H. MacDonell delivered a note to the Foreign Min-
ister, in accordance with Lord Salisbury's instructions, but Senhor Lobo d'Avila
made it clear in conversation that he did not interpret the agreements in that
sense. He said that the agreements clearly lay down that Portugal cannot alienate
any portion of territory, however small, nor part with any of her sovereign rights,
or alter the territorial status quo without consulting Great Britain, who has a
right of pre-emption, and therefore a written declaration to this effect would
be superfluous. On the other hand, he maintained that, as soon as the Award is
given, the Portuguese Government necessarily comes into absolute and undis-
puted possession of the railway, and of all the privileges attached to the original Concession, and he considered that the payment of the Award would give Portugal the incontestable right, should she deem it necessary, to intrust others with its control and administration, which would carry with it no alienation whatever of sovereign rights. He was willing to give verbally the most positive assurance that the Government had neither entered into, nor intended to take any steps or enter into, any sort of engagement which would in any way commit them with respect to the eventual fate of the railway; but he declined to bind the present Administration or any future Government by a written declaration which would in itself constitute a renunciation of their sovereignty over the railway and territory in question in favour of Great Britain after the publication of the Award. He gave the usual civil assurances, and said that the Government were determined to keep the line in their own hands, adding that the money for the Award, which he estimated at 500,000l. or 600,000l., was already set apart, and this Sir H. MacDonell believes to be the case.

In his written reply (of the 7th September) he reiterated the statement that the Portuguese have no intention of alienating their sovereignty over Lourenço Marques or 'any other district of their colonial possessions;' and he added that they not only considered the development of their legitimate national interests in Lourenço Marques to be compatible with the most friendly relations with England, but they deemed it / useful and expedient that these relations should be drawn still closer and confirmed.

On the 17th September, Lord Salisbury telegraphed to Sir H. MacDonell a Report from Sir J. de Wet that Dr. Leyds (the Transvaal State Secretary) was at Lourenço Marques negotiating for running powers over the line, with a view of eventually securing a lease of it; and he instructed the Minister to inform the Portuguese Government that Her Majesty’s Government cannot admit either that Portugal has any right to lease the line without first offering it to Great Britain, or that the South African Republic have any right to have dealings with Portugal or any other foreign State except through Her Majesty’s Government. The last words are noticeable as being a distinct advance on any contention put forward by us since the London Convention of 1884.

In connection with the Portuguese claim, that a lease of the railway would not be a cession of sovereign rights, it may be useful to remember that they have put forward the opposite contention, in the strongest possible form, before the Berne Tribunal. In their Counter-Case they say:–

‘Le droit de controller l’exploitation technique et commerciale du chemin de fer est un droit souverain et inaliénable de l’État auquel aucun Ministre ne peut renoncer, parce qu’il est indispensable à la réalisation du but de l’État.’

* Quoted in the ‘Réplique Anglaise,’ p. 71. I have not verified it by a reference to the Portuguese Case.
IV. – The Railway Question in South Africa.

With the growth of the Transvaal this question has rapidly been coming to the front, and is now the most important one in South African politics. As between the Cape and Natal, the competition for the lucrative traffic of the Transvaal has accentuated and somewhat embittered the oldstanding rivalry between them; and as between the Cape and the South African Republic, the policy of the Transvaal Government, or of the Netherlands South Africa Railway (for in this matter it is hard to say if the railway is the Government or the Government the railway), has contributed to the notable weakening of the sympathetic ties which long connected Afrikanders in the two countries.

On the retrocession of the Transvaal in 1884, the policy of its Government was to discourage in every way trade with Great Britain or her Colonies, and especially to prevent any extension of British railways by which troops might be thrown into the country.

In 1887 they subscribed to the funds of the Netherlands South Africa Railway for the purpose of extending the Portuguese railway to Pretoria, and President Krüger endeavoured to induce the Orange Free State to forbid the extension through that State of any Cape line for a period of ten years. In this he failed; and in 1889 and 1890 Agreements were made between the Cape and the Orange Free State by which the Cape, at its own cost, has constructed, maintained, and worked the line from its border to the border of the South African Republic. The Orange Free State have power to take over the line at cost price; they receive half the profits, while losses, if any, are to be borne wholly by the Cape.

The Netherlands South Africa Railway Company is the outcome of a Concession given in 1884, and was first effectively constituted in 1887. It is nominally a Dutch Company domiciled at Amsterdam, but the greater part of its funds have been obtained from German sources. It has the monopoly of constructing all lines running to the borders of the South African Republic, except such as the Government may wish to construct itself – a reservation of which, I believe, no use has yet been made. The Transvaal Government is said to own from 80 to 90 per cent. of its share capital, and the total of its share capital and loans (all guaranteed by the Government) amounts to about 6,750,000l.

In 1892, the Government procured a loan of 2,000,000l. from Lord Rothschild, which they transferred to the Company for the completion of the Transvaal section of the Delagoa Bay line, and the Company is repaying it in instalments.

In 1890, the pressure of the mining population became too great for the President’s policy of shutting out the British lines; and, after a kind of émeute had occurred at Johannesburg, he determined to make use of the Cape until his own line, which by then was well advanced, should be completed. In December
1891 an agreement was made by which the Cape lent the Netherlands South Africa Railway Company 300,000l. towards extending the line from the Orange Free State to Johannesburg and Pretoria. This line was opened in 1892. In return the Cape obtained running powers and the right to fix tariff rates over the Transvaal line till December 1894, when, the Delagoa Bay line being finished and the Cape loan repaid, the South African Republic terminated the agreement, and opened hostilities against the Cape.

The ambition of Natal to get a share of the Transvaal traffic (in anticipation of which the Colony had incurred a very heavy expenditure on railway construction) was gratified in February 1894, when an agreement was concluded for the extension of their line from Charlestown to the Transvaal railway system. The extension, which is now completed, was undertaken for the Netherlands South Africa Railway by the Natal Government, who received the price in debentures of the Company which they disposed of in Holland. Elaborate tariff provisions are made in the agreement for insuring that the Natal route shall not operate to the disadvantage of the Delagoa Bay line, and there is every reason to believe that President Krüger only sanctioned the line in order to use it as a weapon against the Cape. Quite recently he is said to have formulated his policy thus: ‘His’ line to have all it can carry, Natal to have the rest, and the Cape to get the crumbs that fall from the table.

There are now five lines of communication by which traffic from the South African Republic can reach the coast, three of them being through the Cape. They are:

1. Cape Town to Johannesburg (Cape Western system.) 1,015 miles.
2. Port Elizabeth to Johannesburg (Cape Midland system.) 715 miles.
3. East London to Johannesburg (Cape Western system.) 666 miles.
4. Durban to Johannesburg (Natal line.) 480 miles.
5. Delagoa Bay to Johannesburg (Portuguese line.) 396 miles.

The first of these lines is not really a competitor on account of its excessive length. The second is cheaper to work than the third, in spite of its greater length, and has hitherto been preferred by importers, but the East London route is rapidly overhauling it. What the value of the prize is for which the several lines are contending may be seen from the fact that in 1893 these two lines alone carried over 137,000 tons of traffic to the Transvaal, for which they received 388,000l., at a cost of 122,000l. — thus earning a profit of 266,000l. And for the first seven months of this year, over 5,000,000l. worth of goods have been imported into the South African Republic, of which nearly 3,500,000l. were brought over the Cape lines, while less than 500,000l. came through Delagoa Bay.

The latter railway should have a formidable advantage over its rivals. Besides being much shorter, the Transvaal Government favour it by allowing it to retain
the customs duties on goods imported by it; and as their duties range from 7½ per cent. upwards, the benefit thus gained is very considerable.

The policy of railway extension recently followed by the South African Republic seems at first sight a reversal of its previous policy of discouraging communication with the British Colonies, but this reversal is more apparent than real. The power of directing traffic through other channels is a weapon which the President can use against the Portuguese to enable him to secure their line on cheaper terms than they would otherwise accept; but, besides this, he will now be able to play off the two English Colonies against each other, and though, for the moment, he is favouring Natal against the Cape, he will doubtless leave the former in the lurch when it suits him.

A Conference of the various Administrations was held at Cape Town in November last to devise some modus vivendi, and the Cape, which had hitherto claimed to receive one-half of the gross traffic in any such arrangement, now lowered its claim to two-fifths; but as Natal claimed one-third, and the Transvaal would listen to no proposal which did not favour Natal as against the Cape, and Delagoa Bay as against both, the Conference led to no result.

Since then there has been open warfare between the Cape and the South African Republic. The latter led off by raising the tariff on their section of the line, from the border to Johannesburg (52 miles), on goods coming from the Cape / through the Orange Free State.* The Cape met this by arranging to off-load goods on the Orange Free State side of the frontier, and forward them by ox-waggon to the Rand, and this service has attained large proportions – to the benefit of the Orange Free State transport-riders. But now that the Natal line is finished, the Transvaal have issued a Proclamation closing to over-sea traffic the drifts by which these wagons entered their territory; and the Cape have protested against this action as a breach of the XIIIth Article of the London Convention, and ask the intervention of the Imperial Government.

Meanwhile, the Delagoa Bay line has proved unequal to the demands upon it. The Portuguese section is so badly kept up that heavy engines dare not run over it; the locomotives are insufficient in number, and break down from overwork; the landing facilities are hopelessly inadequate; the Customs staff is ridiculously undermanned; goods are strewn on the beach, damaged, lost, or only found after days of delay; and every impediment that official incompetence can devise is placed in the way of speedy transit. Consequently, the block is so great, and the

* According to a despatch from Sir Hercules Robinson, dated the 7th October, 1895, and received since this Memorandum was written, up to the close of the Agreement the through traffic rates from the coast to Johannesburg had been fixed by the Cape at the average rate of about 2.4d. per ton per mile. After the close of the Agreement the Netherlands Railway Company raised the rates on its 52 miles of railway, from the Vaal River to Johannesburg, to an average of nearly 8d. per ton per mile.
Bay has got such a bad name, that shippers are diverting their cargoes elsewhere. In Johannesburg, at the other end of the line, importers have almost equal difficulties to contend with, though these are, of course, experienced whatever route is adopted. By order of the Government, the Netherlands South Africa Railway use nothing but Dutch in their business communications with their English customers, and import Dutch officials unused to and unfit for their work. The congestion of traffic is such that mines have to burn wood to keep their batteries going for want of the coal they have ordered, drapery people find their stocks out of fashion before they receive them, and so on through every branch of trade.

V. – The Policy of Her Majesty’s Government after the Award.

The foregoing pages have shown the position as between ourselves and the Portuguese. We claim that they are not free to give a Concession of the railway to any but ourselves; they refuse to recognize the claim, while privately assuring us that they will not dispose of the line. What are they likely to do?

Germany, Holland, and the South African Republic are united in urging them to give, at least, a lease of the line to the Netherlands Company, *i.e.*, to the Transvaal. We know that the Portuguese long ago promised the Concession to the Transvaal; that the Transvaal undertook to bear any share of the Award; that Portugal has the greatest difficulty in finding money for the service of her debt, and that she must have incurred heavy expense in her operations against the natives; that, in May, 500,000l. were mysteriously transferred from Pretoria to Lisbon; and that, in August, the Portuguese Government acknowledge to having 500,000l. or 600,000l. set aside for the Award. On the other hand, the Portuguese say that they have entered into no engagement respecting the future of the railway. The balance of probability is against the hypothesis that they are speaking the truth.

How are we to enforce our claim? Certainly not by arbitration. It would be sufficient for the Portuguese to reply that they have granted similar Concessions south of the Zambezi without protest from us; and that, moreover, Article VII is a reciprocal engagement, and that they are doing in their territories even less than we have done in ours to diminish the value of the reversion to one or the other Power. And even if the Portuguese Government were willing to accept our view, could they get the approval of the Chambers and of public opinion, which apparently would rather see the line in any hands than ours?

Assuming that the amount of the Berne Award makes it indispensable for Portugal to seek help from outside, that Her Majesty’s Government can find means of overcoming the difficulties mentioned above, and that the Portuguese can be induced to lease the line (a sale seems out of the question), the possible courses are:–

Purchase by an English Company.
Purchase by the Cape, direct or through Lord Rothschild.
Purchase by Natal.
Purchase by Her Majesty’s Government.

Secrecy and rapidity of action before agitation could be set on foot in Portugal by other parties seem essential, and this alone would negative the idea of an English Company, though other objections, noticed later on, would also apply.

Purchase by the Cape or by Natal would be objectionable. The two Colonies are rivals in the matter, and whichever obtained the Concession would use it as a weapon against the other. In fact, either, with its own line, *plus* Delagoa Bay, could practically ruin the other (unless the latter obtained the active assistance of the Transvaal, which it could probably get – at a price), and we have every reason to think that either would push its advantage with very little consideration for the other. It would not be just for Her Majesty’s Government to lend themselves to this, and if they did, they would be brought into a dangerous position, owing to the feeling that would be aroused against them.

It may be argued that by acquiring the Delagoa Bay line the Cape could force Natal into confederation, but how if Natal refused to be forced, as she doubtless would, and sought safety in a closer alliance with the Transvaal? The idea may be fantastic, but it has more than once occurred to me that among President Krüger’s day-dreams may be that of the possibility of detaching Natal from the British Crown.

There remains the proposal of direct purchase by Her Majesty’s Government, which has all the advantage of prompt and secret action. But if we purchase on our own account we stand to lose, for there can be little doubt that the President would be so enraged at finding his plans frustrated, that he would prefer to send his traffic through Natal and the Cape; and if, on the other hand, this did not happen, Her Majesty’s Government would be in a most difficult position as a trade competitor with the Colonies.

(The same difficulty would be experienced in a lesser degree if Her Majesty’s Government enabled an English Company to get possession of the line.)

In these circumstances, I suggest the following plan as a solution: – /

Her Majesty’s Government should lease or purchase the line; the Cape and Natal should guarantee the interest and sinking fund; and then the line should be administered by the two Colonies for their joint benefit, the profits being divided between them in proportion to their guarantees. Thus, if the line is a loss through being boycotted by the Transvaal (which is unlikely, as there would no longer be an object in doing so), what the Colonies lost in this way they would gain in the extra traffic carried over their own lines, and if their own lines suffer through the competition of the Bay, they would be recouped by the profits from the latter.
It would be necessary that the purchase should in some way include exemp-
tion from the fiscal or administrative interference of the Portuguese, for 
otherwise the Concession would be so hampered as to be unworkable; and it 
would, I consider, also be necessary to stipulate with the Colonies that Her Maj-
esty’s Government could at any time take back the railway on equitable terms. 
The reason for this I give presently.

It is clear that we should have to face a violent protest from Germany, but it 
may be assumed that Her Majesty’s Government are prepared to disregard this, 
as there would otherwise not be much point in their recent diplomatic action.

There would be no good ground for such a protest, as, on their own showing, 
German interests are pecuniary and commercial, and these would be advanced 
rather than hindered by a business-like administration of the line. But, none the 
less, the protest would be made, and doubtless political motives would under-
lie it. It is contrary to reason to suppose that Portugal can for long continue to 
maintain this narrow barrier between the Transvaal and the sea, and it must be 
well known in Berlin that the Boers, or, rather, the more ignorant section of 
them, known as the Doppers, look forward to a Republic owning Delagoa Bay, 
and under a German Protectorate. The idea of such a Protectorate is of long 
standing, and so far back as 1876 negotiations are said to have been opened at 
Berlin on the subject.

It is evident that if we are to acquire the line, we must be prepared to pay 
a fancy price for it. Our utmost right is one of pre-emption, and the / Portu-
guese have been sufficiently apprised of its value by the active competition for 
its possession. The British claimants before the Berne Tribunal have estimated 
the value of the whole MacMurdo Concession (lands, docks, and railway) at 
anything up to 5,000,000l.; the Portuguese have appraised the line, for the pur-
poses of the Award, at 163,000l., and their selling price would probably be not 
less than 2,000,000l. But having regard to the low rate at which we can raise the 
money, and to the traffic prospects of the line under good management, there is 
no reason why it should not prove remunerative even at such a price. The meas-
ure of the value of the line to the Colonies is not so much what it would yield in 
their hands as the injury it would be capable of doing them if controlled by oth-
ers. From an imperial point of view, it seems absolutely necessary that we should 
acquire the railway (and hereafter the Bay) at any cost. Here, again, the measure 
of its value to us is not only the use which we should make of the Bay, but the 
effect on British interests of a German occupation of the territory, which seems 
to be the necessary alternative. Further than this, it is inevitable that within a 
few years English influence will prevail in the Transvaal, and it is idle to expect 
that, if we have neither assistance to give nor advantage to offer, its present form 
of government will undergo any change. The existence of a rich and powerful 
English-speaking Republic on the borders of our South African Colonies would
have an influence on the latter, and possibly on our whole Colonial Empire, which it would not be easy to exaggerate. But if we have it in our power to offer them, when the time comes, the immediate control of the line, and the eventual possession of a port and seaboard, there is no reason why they should not again come under the British flag as a self-governing Colony. It is for this reason that I have suggested the advisability of leaving ourselves free to resume the line from the Colonial Governments, so that, in a political rearrangement of the kind fore-shadowed, we may be able to secure fair play all round.

G.V.F.

October 11, 1895.
F. Cardew, *Railway Schemes for the Colony of Sierra Leone. An Address before the African Trade Section of the Liverpool Chamber of Commerce, 2 August 1895* (Liverpool: Chamber of Commerce, 1895).

THE AFRICAN TRADE SECTION

OF THE

Incorporated Chamber of Commerce of Liverpool,

AUGUST, 1895.

Railway Schemes

for the

Colony Of Sierra Leone.

Address given by

His Excellency Governor Cardew, 1 C.M.G., at a Meeting

of the Members, held at the Rooms of the Liverpool

Chamber of Commerce, August 1st, 1895.

[Extracted from the 'Liverpool Journal of Commerce,' August 2nd, 1895.]

Yesterday, at the rooms of the Liverpool Chamber of Commerce, an address was given by his Excellency Col. F. Cardew, C.M.G., Governor of Sierra Leone, before the members of the African section of that chamber, and others. The title of the address was 'Railway Schemes for the Colony of Sierra Leone.' Mr. Ellis Edwards, chairman of the section, presided [...]

The Chairman said:– Gentlemen, I have pleasure in introducing to you his Excellency Colonel Cardew, Governor of Sierra Leone, who has very kindly come here to give you some information on the subject of railway schemes for
the Colony of Sierra Leone. (Applause.) You have doubtless all received a pamphlet lately circulated from this chamber, containing a most interesting and instructive address given by his Excellency to the Legislative Council of Sierra Leone. This will have given you a great deal of information about the Sierra Leone hinterlands, or what is left of them, and the capabilities and wants of the colony. Col. Cardew has travelled much in the interior, and has acquired an extensive knowledge of the country and people. His journeys by land in the colony and its hinterland have extended over 1,500 miles. He will doubtless tell you he is convinced that railways into the interior are urgently required, and that there are good prospects of their ultimate success as investments. We must not, however, forget that few railways, even in this country, or in India, pay directly in the first instance, but they do so indirectly, by promoting trade, and by increasing revenue, to say nothing about their civilising power in a country like Africa. A missionary from Lagos lately expressed the opinion that a railway in the hinterland of Lagos would do more to civilise the nations and bring them under Christian influences than a large number of missionaries. Railways in West Africa are a necessity of the times, and we must have them. They would add immensely to our political influence and put an end to many petty wars that occur in the interior. They would further benefit our trade with Africa, and through that trade many industries and manufactures in this country; and in a few years, having revolutionised commerce with the West Coast, everyone would ask why they were not made years ago. This country is the last in the field in their construction. France has 150 miles of paying railways at the Senegal, Portugal by this time has over 200 miles at Loanda, with satisfactory and increasing receipts, and Germany is undertaking a line at Waldfish Bay. Personally I am in favour of railways being made in all our West African Colonies, but especially at the Gold Coast, Lagos, and Sierra Leone. We here cannot pretend to say exactly which route should be chosen at any of these places. This is a matter for the Government and the African merchants on the spot. What we ask is that there should be no further delay in their construction. The African trade section of this chamber has for some years been agitating for railways in West Africa, and I believe we shall soon be rewarded for our trouble, as our members of Parliament have promised to vote for railways, and have referred to the need for them in their speeches and addresses, and the Colonial Government are now fully alive to the importance of them. In conclusion, I think it is of the utmost importance for the success of the coming railways that natives should be brought from the different places in West Africa where railways are likely to be made to this country, to learn railway work, in order to enable them, when railways are made, to act as porters, guards, station masters, &c. I now call on Col. Cardew to give his address.
Colonel Cardew, who was heartily received, said: I will ask your permission to allow me to read my paper, because the subject is somewhat full of details, and because I think I shall be more correctly reported, for I understand that one of the objects of my coming here is the wider dissemination of the information I gave before the Sierra Leone Legislative Council, and which is already published in the pamphlet from, which I see some of you gentlemen have in your hands. I will now proceed to read what I have to say on the colony. and the railway scheme in connection with it:–

[...] With respect to any scheme for a railway, whether such railway were constructed in the direction reported on by Mr. Shelford, whose report I daresay has been in the hands of many gentlemen present, or due eastward, or to the south-east, the question of traversing the broken and hilly country, which forms the eastern portion of the protectorate, must be faced if the railway is to be extended so as to tap the resources of that country, an object which should, I think, be the final purpose of any projected line. The hilly country is so broken up and rugged that it does not need an expert to show that unless some river valleys offering easy gradients exist, along which a railway line could thread its way, the cost of overcoming the engineering difficulties entailed by penetrating such a country would be quite prohibitive of the scheme. The only suitable valleys, as far as I know, are those of the Sehli or Rokelle river in the north, and of the Moa or Sulima river in the south. and which of these valleys the line should follow should be determined, I think, by the following considerations, which I propose to refer to seriatim:– (1) Characteristics of the natives and density of population; (2) nature and fertility of the country and existing products and trade routes; (3) capability of country for development; (4) prospects of trade from countries outside the protectorate. With regard to the characteristics of the natives I need not trouble you with a detailed statement concerning each tribe; it will be sufficient to say that generally speaking the tribes in the northern half of the protectorate are more intelligent and industries than those of the southern half, which mainly consist of Mendis, who was are not at all industrious, and are very superstitious. Besides, those in the northern half, if not Mahommedans or Mushrikin, or professing Mahommedans, are more or less under Mahommedan influence, so more temperate in their habits and reliable, but the population in the southern half is more dense than in the northern. With respect to the nature and fertility of the country and existing products and trade routes the main trade routes through the protectorate are as follows:– (1) From Falaba by Bafodeya or Bumban thence to Port Lokko; (2) from Matatoka, tapping the Kuniki and the Sanda Kono countries (the latter in the region of Karriyemma), thence by road to Benkia, on the Rokelle, where the produce is loaded in small canoes and transported to Magbilleh, and thence transshipped in larger ones to Freetown;
(3) from Mongheri, through Senahu, to Freetown; (4) from the Upper Mendi districts to Mafweh, Pujebun, and Bandasuma respectively, thence by waterways to Bonthe, Lavana, Sulima, and Mano Salija. As to the produce conveyed along these routes; by the first route small quantities of ivory and gold from the interior, rubber from the interior, and also from Kuranko; cattle in considerable numbers, kola nuts, small quantities of palm kernels and oil, and rice chiefly from the districts around Port Lokko; by the second route plam kernels, rubber, benni seed, kola nuts, rice, &c.; by the third route rubber and kola nuts, a little ivory, and a small quantity of palm kernels; by the fourth route rubber, small quantities of kola nuts and ivory, and large amounts of palm kernels and oil.

Turning to the nature and fertility of the country, I think there is no doubt that the southern portion of the protectorate, which may be divided, roughly speaking, from the northern by an east and west line drawn through Port Lokko, is by far the most fertile and productive. In the northern portion the country lying to the west of the range of the Warra Warra Limba mountains, which extend from Bafodeya to Bumban, is, generally speaking, open grass land, with ‘scrub’ well adapted for grazing cattle, but the soil is either light and sandy or mixed with gravelly laterite, and in some parts so little productive as not to be able to raise sufficient rice, which is their staple food, for the inhabitants. To the east of the range as far as our frontier the country is richer, especially between Sininkoro and Karriyemma, where it is under forests for the most part, in which the rubber vine abounds, but the valley of the upper waters of the Bagweh, Bafin, and Sehli rivers, which comprehend the Iraiya district, are not productive. There are no palm trees to the east of the Warra Warra Limba range, and these trees are very scarce to the west of it, and the only district where they grow in any productive quantity is about Massumbu, where they were noticed by Mr. Bradford during his survey of the line to Bumban. On the other hand the southern portion may be said to be throughout rich and productive, especially in oil-bearing palms; the districts about Sherbro and all along the coast are famous for the amounts of oil and kernels which they yield. In some parts of the Bargru district, along the coast, the natives even complain that they are so numerous as to impoverish the land, and that they cannot in consequence grow rice; but these rich products are not alone confined to the lower districts, the Upper Mendi districts as far north as a line drawn from Mongheri to Kanre Lahun, and the Saua Konno district, to the north of that line, abound in palm trees, but only a small portion of the harvest they yield is gathered in consequence of the distance from a market and difficulty of transport, and, as one chief informed me during my recent tour, because there are not enough people to pick the nuts, meaning there were so many nuts. Besides, the forests yield rubber and many valuable woods, such as konta and kamwood, which of course cannot be utilised, owing to the difficulty of transport. In the district lying immediately north of the route from Senahu to...
Tninahu there are no palms, but at Senahu there is a rich belt which follows the valley of the Bumpe river.

Though I believe that there is little or no mineral wealth in the protectorate, and that we are never expect a rise by leaps and bounds in the prosperity of the country, still I am of opinion that by judicious administration, a well-ordered and disciplined police force, particularly instructed to foster trade, the prompt suppression of any slave raiding or intertribal disturbances, and the encouragement of the natives by every means to reoccupy wasted and deserted districts, giving them where necessary seed rice to sow their farms, there will be a steady development of the resources of the country and a marked increases in the volume of trade. One means to these ends is obviously to encourage and instruct the natives in the cultivation of such products as are now left to nature to develop, but perhaps the foremost is to increase their wants. As long as these are few it is obvious the natives will only produce just sufficient to supply them, but as they increase so will the products be forthcoming to obtain them.

It often occurs to me when I come across factories in the interior that a greater variety of articles and more tempting ones might be on sale in them. The inside of a store, with its piles of Manchester woven goods, huge iron cooking pots, demijohns of rum and green cases of gin, has a somewhat somber appearance. There seem to be no articles bright and attractive for the natives, such as one would see in a Kafir store in Zululand or Natal, and such as the itinerant Syrian traders and hawkers, who are coming in such increasing numbers to Freetown and penetrating the interior, have amongst their wares. I make these remarks with much diffidence in the face of so many experienced merchants as I believe are before me. Further, it appears to me, apart from the moral point of view, that it would be so much better for trade if other wants and desires were created in the native mind besides those for the noxious beverages which are presented to him in the form of so-called gin and run. I noticed again and again in my travels in the interior that, wherever there was a drinking chief, his people and their towns and villages had an untidy, dirty, and poverty-stricken air, and there were few if any signs of trade going on or produce being gathered in.

The missionaries in the interior, particularly those of two or three American societies, are doing very good work (but, alas! at a great cost of life) in creating new wants amongst the natives by means of industrial training and other civilizing agencies, but still more can be done by the traders themselves by pushing their trade further afield and carefully studying the requirements and tastes of the natives. The Upper Mendi, Konno, and Kuranko districts furnish a wide field for commercial enterprise; the people are almost in their primitive condition. Manchester woven goods and cottons have scarcely found their way there, and it is most unusual to see in a crowd anyone dressed otherwise than in native-made fabrics. On the other hand, where an article is offered which meets a felt want,
it is surprising how quickly the natives acquire it. I found women using patent cotton carders of English or American manufacture in the remotest towns of the interior where no other article of European commerce could be discovered, and observed large numbers of these articles being conveyed in the caravans passing from Freetown to the districts along the Niger, hundreds of miles beyond our territory. The eastern portions of the protectorate, which consist of highlands, with on the whole a bracing and salubrious climate, relatively speaking, are well adapted for the cultivation of coffee, ginger, and other valuable products. Another means for the development of trade and the resources of the country would be the settlement in these parts of natives with capital from Sierra Leone, the West Indies, and the United States, who would be able to carry on such kinds of agriculture. The aborigines live only for the present; they cannot see the force of cultivating plants such as the coffee, for the fruits of which they must wait for a long period of four or more years. They are anxious for 'quick returns.' This may arise in a certain measure from selfishness and want of foresight on their part; but I think it is principally due to the conditions under which they have lived, for instance, to the slave-raiding habits of the people, and to the envy and distrust with which chiefs regard any of their subjects who may be possessed of more than ordinary means. Though slave raiding has practically ceased, the chiefs still exercise despotic powers, hence there is no security of tenure, from the fear of having their property confiscated at the will of the chief, the people are discouraged from making provision for the future; but I hope a closer control of native affairs by the Government will gradually do away with this feeling of insecurity. Already I have observed in the Sanda Lokko and other districts the cultivation of young kola trees along the approaches to the villages and towns, but this industry might be very much enlarged but for the influences I have referred to; and in the hands of enlightened natives with capital it might be made remunerative, for the demand for it is an increasing one, as I have endeavoured to show. The principal trade routes which exist from beyond the Protectorate are those which enter it across our northern frontier through the French posts at Herimakunu and Wossu. On the eastern frontier between Herimakunu and Kanre Lahun, though certain routes cross into our territory, as by Kombili, which is east of Koinadugu, and by Sehamma and thence between the Tinki range and Mount Binsing, practically no trade passes along them, owing to the deserted condition of the country bordering both sides of this frontier. From Kanre Lahun a certain amount of trade is done with the interior at the markets in the country, but owing to the chronic state of warfare which exists between chief Kailundu and the Kissi, Bandeh, and other chiefs, the trade is very languishing and intermittent. Along the frontier on the Liberian side from Kanre Lahun to the coast at Manoh Salija there is, as I have already pointed out, a constant state of warfare, and the border districts are a desert. During my recent tour there appeared
to be a great revival of trade with the interior across our northern frontier, and the number of caravans that have come down are unprecedented; but the future prospects of this trade are very uncertain, and its continuance cannot be counted on, nor have the products which have come down had such an effect as I anticipated in relieving the depressed condition of the market. Considering how very sparsely inhabited the regions of the Upper Niger appear to be, it is possible that the interior trade from that direction is over-rated.

Turning to the consideration of Mr. Shelford’s report, my recent tour has more than convinced me of the desirability of projecting the railway through the Upper Mendi districts rather than towards Bumban: that is to say, through the southern portion of the Protectorate rather than the northern. It must be admitted that the northern portion is on the whole inhabited by a more sober, industrious, and intelligent people, and a people a large number of whom are born traders; but on the other hand, the soil is less productive, and the trade is more or less dependent on the produce which comes from the interior rather than from the soil itself, and the former is, as I have endeavoured to show, an uncertain quantity. Again, such produce as does come down, and which, with the exception of the cattle, consists principally of rubber, gold, and ivory, is not of such a bulky nature as the products of the southern portion, which include palm kernels and oil and timber, and therefore its transport would not be so remunerative to a railway. With regard to the cattle, it is doubtful whether it would be an advantage to transport them by rail; again, the northern portion is not so capable, I think, of development by means of settlers as the southern, for though it possesses higher land towards the east, and possibly a more salubrious climate than relatively similar parts of the southern portion, the soil is not so productive. On the other hand, there is no doubt, as I have already said, that the southern portion is extremely rich in palm oil and kernels, and that its forests contain large quantities of useful and valuable timber and rubber vine.

For these reasons I would prefer the railway passing through the southern portion rather than the northern. Turning to the consideration of the exact route which the line would follow, this could only be determined after a survey by a competent engineer; but during my recent tour I carefully observed the country through which I passed, and am of opinion it should follow the route which leads from Songo Town through Manjehun and Mano to Baoma or Koranko. With the exception of the bridging of the larger rivers, such as the Ribbi and Taia, there appear to be no serious engineering difficulties as regards the configuration of the country. From Koranko my route passed over the range of the Kambui Hills to Segbewema, a very hilly and difficult country; but I am informed that this range can be turned by a road which passed from Baoma through Wendeb into the valley of the Moa or Sulima river. This valley once gained there would, I think, be no great difficulty in carrying the railway as far
as Kanre Lahun. The Ribbi River, which is navigable for steamers of from 6 to 8 feet draft some miles higher up than the point at which it would be crossed by the proposed line, would prove of great service for the transport of materials. This route, while it would not interfere with the cheap and easy means of transport by the waterways through the Lower Mendi and Sherbro districts, would tap the resources of the Upper Mendi districts, at present quits undeveloped owing to their distance from a market and the expense of transport. I don’t think it is necessary for me here to advert to the financial aspect of a railway for Sierra Leone as regards its initial cost and that of its maintenance and working expenses. There matters were fully discussed in Mr. Shelford’s report, and also in the Sierra Leone Legislative Council.

But as to the advantages or disadvantages to the colony that would result from the introduction of a railway, it is possible that at first it might be a failure financially, but there is no doubt in my mind that it would develop the resources of the country through which it passes, and that in the absence of waterways this appears to be the only effectual mode of doing so. So that the question to be determined is whether the prospective advantages from the development of the country outweigh the possible financial losses that may accrue through the railway proving unremunerative.

Palm kernels and oil are the chief products of the interior, and as long as the demand for them continues their transport, owing to their bulk, must be remunerative to a railway. It is to be hoped that this demand will continue, but sometimes the fear arises that this may not be so. In the early part of this year there was a very heavy fall in the price of these commodities, and though the prices, as I understand, have since recovered, they may fall again; but in this matter of the future prospects of the trade in these commodities you, gentlemen, are far better able to give an opinion than I am, but in this connection I venture to think, apart from any railway scheme, that more might be done to increase the supply of palm kernels for the market by the use of labour-saving machines for cracking the nuts. Machines of this kind, I believe, are in use in some of the colonies further south than Sierra Leone on the coast, and that at Old Oalabar there is steam machinery for the purpose; but in Sierra Leone there are no such appliances for expediting the work of cracking the nuts. In the interior the nuts are cracked one by one on a flat stone with another in the hand; the process is very laborious and tedious, and it takes a woman the whole day to fill with kernels an empty gin box, whereas the machine I refer to would do the same work in one-tenth of the time. These machines, I dare say, are known to many gentlemen present; they cost about 8s down the coast, and if they were introduced into the interior I think their advantages would be appreciated by the natives, and that in the course of a short time their use would result in an increased supply of kernels.
As regards passenger traffic, from inquiries I have made, it appears that the aborigines in Senegal largely avail themselves of the railway from Dakka to St. Louis, and it is reasonable to suppose that those in the interior of Sierra Leone would also do the same. For purposes of administration and military control of the country, a railway would of course be very valuable. This has been the experience of French officers in Senegal.

I have endeavoured to demonstrate that, in my opinion, a railway passing through the Upper Mendi country would be preferable to the line proposed to be carried in the direction of Bumban; there remains, therefore, only to consider the desirability of what I may call the Sulima line, from Mina to Sembahun. It already stands condemned in Mr. Shelford’s report, where it is conclusively shown that the prospects of any remunerative returns from it are most remote. I may mention that the estimate of the cost per mile for this line, which would be about 64 miles in length, is over one-third more than that of the main line to Bumban, the length of which would be about 140 miles, i.e., for a light line, as £4,483 to £3,223. The Sulima line would have to compete with the water carriage along the rivers, a far cheaper means of transport, and there would be the cost of transshipment at Mina. The proposed extension to Bendu, shown by the dotted line in the map, would, I should say, be very costly, and would present considerable engineering difficulties in the passage of such large rivers as the Kittam and Great Bum, and the rivalry of the water carriage would not be done away with.

I should like here to revert to a point I have already alluded to, and that is the liquor traffic in connection with the native races. It is a question that is intimately connected with the welfare of the hinterland of Sierra Leone, and must therefore command the attention of anyone, officially connected as I am, with that colony, but furthers, I think it is one that materially affects also the commercial interests of those concerned with it.

I think there is no doubt that the importation of spirits into the interior does the natives great harm. Putting aside the testimony of missionaries, who some may think are unduly biased on the question, owing to their zeal for the spread of the Gospel, which they assert it hinders, there is against it the testimony of many officials who have served on the coast, and amongst others of one of the most enterprising and famous of our explorers. Who is intimately acquainted with the Central African races. I refer to Captain Lugard, who, in an article recently published in the ‘Nineteenth Century,’ speaks in strong condemnation of the traffic, and likens the importation of it to a ‘flood of poisonous liquor.’ Admitting, therefore, that the importation of spirits on the West Coast does harm to the natives, the further question is whether the traffic does not also affect more or less injuriously our mercantile interests.
Its entire prohibition on the West Coast is, in my opinion, quite impracticable. The direct loss of revenue that would result from the cessation of the importation would be ruinous to the colonies concerned, but I think if, by concerted action with the other powers possessing colonies on the West Coast, a much higher duty were placed on spirits, that gradually the demand would cease, and in the meantime other wants by the natives would be created; thus, though the volume of trade in spirits would diminish, it would increase probably in an almost direct ratio with respect to other commodities.

In conclusion, it should be borne in mind whilst considering any scheme or the development of Sierra Leone, that she is not so rich as her sister colonies on the coast. The Gold Coast has her gold fields, Lagos a wealth of palm trees, with a teeming population in her hinterland to produce the oil and receive English merchandise in return; the Niger Company has the magnificent waterways of the Niger and Benue navigable by steamers for hundreds of miles inland, by which the produce is brought down from the remote interior; and the Niger Coast Protectorate, which occupies the delta of the Niger, is intersected with countless creeks and rivers, all of which are highways for commerce. These colonies can get, as it is somewhere remarked, what revenue they like almost for the trouble of collecting it; whereas a very different state of things prevails in the Protectorate of Sierra Leone. On one side it is enclosed by the colonies of France with a barrier of protective tariffs, and on the other by the Republic of Liberia, the hinterland of which, right up to our borders, is in a chronic state of disturbance.

The Sierra Leone Protectorate has no mineral wealth, its population is on the whole sparse, and a large area on the eastern confine is uninhabited; the soil of the northern portion is poor, the rivers, excepting those of the Sulima district, owing to the high lands from which they fall, are obstructed by barriers of rocks often to within a few miles from their mouths, and, even these excepted, have no great commercial importance as waterways, as they are barely navigable beyond 50 miles in a straight line from the coast. On the other hand, Sierra Leone possesses advantages for the development of the interior which are not shared by her sister colonies. She has a large population of Christianised and civilised negroes, many of whom are extremely intelligent, some of whom are men of first-rate ability, and amongst whom are to be found represented all the learned professions. From such a community it should not be difficult to find settlers for the interior, who by their knowledge and industry would be able to develop the products of the land to its fullest capacity, and teach the aborigines the arts of a better system of husbandry than they now possess, introducing amongst them the culture of the coffee, cocoa, ginger, and other plants.

With civilisation would come an increased demand for the useful commodities of life, and thus Sierra Leone, though she does not possess the inherent natural wealth and resources of her sister colonies, or access to the markets of the
interior of Africa, may yet, by the increased impulse given to trade by her greater
development, become a thriving and prosperous colony, and to this end nothing
can more surely contribute than a railway.

I think I have now said all that has occurred to me on the subject of a railway
scheme for Sierra Leone, and I beg to thank you for the very patient hearing you
have given to a subject which I feel might have been laid before you in a far more
attractive and interesting manner than I have done.

The President of the Chamber of Commerce, Mr. Chas. McArthur, said he
had much pleasure in moving that the very hearty thanks of the African Trade
Section and also of the chamber be given to his Excellency Col. Cardew for the
very interesting, weighty, and practical observations he had addressed to them.
He was quite sure they felt it was a matter of great gratification that the affairs
of so important a colony as Sierra Leone should be administered by a gentle-
man who did not perform his duties in a perfunctory manner, but who took the
deepest interest in all that concerned the moral and material well being of the
inhabitants. (Hear, hear.) He was sure they could not have listened to his address
without feeling that they had in that colony the right man in the right place.
(Hear, hear.) He was quite sure that the observations which his Excellency had
made on the subject of their trade with Sierra Leone would receive the earnest
and respectful consideration of all who were engaged in commerce with that
part of the world. They could not but feel the great weight of his observations
on the liquor traffic. They felt it was most important and most desirable that
that traffic should be so regulated that the evils which flowed from it should be
removed, and the result would not only be conducive to the well-being of the
inhabitants themselves, but would in the end promote the growth of legitimate
trade. With regard to the observations his Excellency had made on the subject
of railways, he was quite sure they would command the attention of those who
had to decide which was the best route in which railways should be laid in that
colony. He thought he might say that, as far as the Chamber of Commerce was
concerned, they were not very particular about the route as they were to see
a railway established. They were content to leave the question of route in the
hands of those best qualified to judge. They had, in season and out of season,
been pressing the Government to take up this matter of railway construction,
and they believed now that the work of conversion was accomplished, and that it
might speedily find an outcome in the work of construction. That was a consum-
mation they all desired to see realised. He was sure the observations of Governor
Cardew on the subject would find their way to a very large auditory, and would
have weight in deciding the minds of those who had to deal with this question.
He had pleasure in moving the vote of thanks.

Mr. A.L. Jones said that after the very able address of the president of the
chamber, he would merely emphasise his remarks about their visitor, to express
as strongly as possible the sincere thanks of the West African Section to Governor Cardew for his able address. It was a great advantage for commercial men to be in touch with Government officials, and it was a great pleasure to find that Liverpool and Manchester had been the cause of having these routes named surveyed, and that the results had been so highly satisfactory. The Governor had referred to the duties on spirits. The Liverpool merchants and those interested had no hesitation in recommending those duties to be increased where those duties were properly applied, and where the colonies had got a very large surplus revenue they thought they should ask them to spend that revenue before they increased taxation to the disadvantage of the trader, for it would be dangerous for Sierra Leone to increase her taxation unless their neighbours did the same. (Hear, hear.) Any increase in the duties of spirits would be supported in Liverpool, but it was necessary they should act with their neighbours. If France would be willing to increase the duties on spirits England would be the first to recommend it – (applause) – but not unless the increase was also applied by other nations. (Hear, hear.) The amount Col. Cardew had said was necessary to make this railway was so small that it seemed ridiculous to hesitate. In the pamphlet it was stated that it would cost £6,000 a year. This to a colony like Sierra Leone, where there was such valuable land, should be absolutely nothing, and they should not hesitate. Liverpool men had agitated for a great many years to get such a railway made, and they must really let officials in London know that they were getting impatient. They thought they were wasting their time. (Hear, hear.) They had a right to be considered and a right to attention. He was grateful to Col. Cardew for giving them such an able address. It was one that was of great value to commercial men. (Applause.) Mr. J. Holt supported Mr. Jones’s remarks in regard to the railway and the liquor traffic. These questions had been before the section on various occasions, and they had spoken their minds on the subject. Mr. Jones had correctly stated that they had no objection to the Government taking the liquor traffic into their own hands. It was so unprofitable to the merchants engaged in it that if they lost it altogether they would not lose much. Personally, he should like to see the Government taking a monopoly of the liquor traffic, and doing away with the disgrace that in some people’s minds attached to the selling or liquor to these poor Africans. The thing was greatly overstated – (hear, hear) – not purposely, perhaps, but much that was said was erroneous. He had been in Africa, and had mixed amongst the men who paid for and took liquor, and he had never seen anything of what he had heard went on. – (Hear, hear. & e., a voice, ’Perfectly true.’) They got such reports of the fearful state of the natives, who were said to be debased by the liquor traffic, but he did not believe a word of it. (Hear, hear). He did not care who made these statements – he challenged him to prove it, as applying to the whole of the population, and that was the impression that was left on the minds of the people of this country. (Hear, hear.) They had the right to
call in question such statements, and to ask that such people as the governors of
their colonies, like Governor Carter, the Governors of the Gold Coast and Sierra
Leone, should have their evidence taken before the statements that had been
made should be accepted by those who heard them. (Applause.) This was mat-
ter that he wished to refer to, especially as it was agitating people’s minds at the
present moment, and he wanted to call public attention to it, and to put a stop to
such reports. Governor Cardew thought that possibly the increase of duties on
liquor would have some effect in stopping the liquor traffic. It would be a source
of revenue to the colony if they could increase the duty, but they must always bear
in mind one thing—a thing that was sometimes forgotten—and that was not to
put a premium on the native production of spirits. High duties would be a greater
inducement to the natives to produce their own spirits. There was no reason why
they should not distil their own liquor if they got to know how. It might be done,
and the more they increased the duties the greater would be the inducement to
the native to produce his own liquor, and perhaps stronger than it was made now.
With regard to the question of the railway they took credit for having brought
this matter before the governors of the coast. They wanted them to make the
railway—to spend the money they got in revenue judiciously in the making of
these railways. He did not think they would like to see railways constructed that
would not be remunerative. If they were not remunerative, the money spent on
them would be wasted. He was pleased to hear the Governor criticise the route
to Bumban. He was not convinced that this was the best route, and was of opin-
ion that the lower route through the southern part of the colony to the Upper
Mendi would be most likely to be the successful route. He wondered how it was
that the route to Bumban had been surveyed when the governor in going across
the country came to the conclusion that the most desirable route was in a dif-
ferent direction altogether. How was it that the officials did not find this out
before they made the survey? It was a serious waste of time, because it meant that
another survey would have to be made, and it might necessitate years of labour to
get this lower route surveyed as the upper one was. It was a pity they did not dis-
cover this until the governor went there and found the lower route the better one.
He had much pleasure in supporting the motion. / Mr. Zochonis (Manches-
ter) said he never felt his inability to express his gratification at the interesting
address of Col. Cardew more than at present. The colony of Sierra Leone was
to be congratulated on possessing such an able administrator. They had had able
men before him, but none more able than he. (Hear, hear). He had been deputed,
with another gentleman, to report to the Manchester Chamber of Commerce on
the report of Mr. Shelford. and he had come to the same conclusion as Governor
Cardew, that the route proposed by Mr. Shelford was not exactly the right one,
and they had already recommended the Chamber of Commerce of Manchester
to disapprove of it. The Chamber had communicated with the Colonial Office,
recommending the route to the Upper Mendi. He did not think it was necessary that there should be the delay spoken of by Mr. Holt, for the first portion of the railway could be proceeded with. It would be a waste of money to construct the other, because there was a waterway there which was quite sufficient for the trade. He had resided for a good many years in Sierra Leone and he believed that the traders connected with the colony would be grateful to Col. Cardew for all he had done for the trade there. (Hear, hear).

Governor Cardew said he was extremely obliged for the kind expressions used in reference to this work. As regarded the liquor traffic, what he had said—though perhaps he was not quite clear—was that prohibition was impracticable, and that any marked increase in the duties on spirits must be arranged in concert with all the nations possessing colonies on the West Coast. It would be a suicidal policy to raise the duties in one colony, and then find that Germany, France, or Liberia would take instant advantage of it to pour their liquor across the borders at a lower rate than it was sold for in their own colony. What they should strive to do was to get that concert amongst the nations concerned, which they had in the case of the introduction of arms of precision into the interior. He thought the demand for spirits would decrease with a higher duty, but that trade generally would increase and make up for the loss on spirits. With regard to the remarks of Mr. A. L. Jones about the cost of the railway, he might say that £6,000 a year would be the cost of only one portion—that to Songo Town, only 30 miles of railway. If this line were extended every extension would necessitate a greater demand on the resources of the colony. Mr. Jones also referred to the reserve fund of the colony, which he said, could be used for this purpose. Unfortunately they did not possess a reserve fund of any great amount; it was not more than £35,000, if so much. With regard to the remark that the natives might make distilleries unless alcohol was introduced into the country in sufficient quantity, he did not think this would be so. The natives he thought, would content themselves with the palm wine of the country, which was very good, and answered their purpose. He was glad that his opinion had been confirmed by Mr. Zochonis with regard to the construction of a railway in the southern part of the colony. The railway to the north was projected before he had any voice in the matter. He thought the gentlemen present would bear him out when he said that by far the richer part of the colony was the southern porting, up to the district of the Upper Mendi, and it was here he proposed that the railway should go rather than that surveyed to the north. (Hear, hear.)

[...]

THE BEIRA RAILWAY.

REPORT OF PROCEEDINGS.

BEING A REPRINT FROM THE ‘RHODESIA HERALD’ OF THE VARIOUS MEETINGS HELD IN SALISBURY, RHODESIA, ON THE ABOVE QUESTION.

Printed in London on behalf of the Beira Railway Extension Committee, Salisbury, Rhodesia.

Salisbury, Rhodesia,
13th December, 1895.

For a long time past the inhabitants of Mashonaland have been labouring under serious disadvantages, occasioned chiefly by the lack of efficient transport, and in consequence – instead of going steadily ahead, as it should have done – the country is practically at a standstill.

A reference to the map of South Africa will show that the natural highway into the country is plainly via Beira and the East Coast, and repeated applications have been made to the British South Africa Company to extend the Beira Railway right up to Salisbury, without attaining the desired result, notwithstanding that it has been conclusively proved that it is absolutely impossible to develop the mines profitably, or even to bring up the required machinery for that purpose, with the present inadequate system of ox-wagon transport.

It is not intended in this letter, nor, indeed, would it be possible, to give full particulars of a scheme which involves such enormous interests, but we beg to
enclose / you a pamphlet reprint from the *Rhodesia Herald* of the reports of the various public meetings recently held in Salisbury, containing all necessary details. The result of these meetings was to elicit a reply from Mr. Rhodes to the effect that the railway would be extended to Umtali, or about half way to Salisbury. This reply, however, not being considered as one adequately meeting the case, it was unanimously decided at a further public meeting to petition her Majesty the Queen on the subject, and a petition will in due course, it is trusted, come before the House of Commons during the next Parliamentary Session.

The object of this petition is one which appeals to the heart of every Englishman, viz., a desire to obtain justice, and our Committee feel sure they can rely upon the support of their brethren at home.

In giving publicity to this just claim, and according it your support and influence, you will be rendering a service to the entire population of Eastern Rhodesia which can only be calculated by the overwhelming importance this question possesses for them and their future.

On behalf of the Beira Railway Extension Committee,

I am, dear Sir,

Faithfully yours,

W. E. FAIRBRIDGE,¹

*Hon. Sec.*

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**NOTE.**

So large an amount of English capital having been invested in Rhodesia, and especially in mining companies, it is felt by the Beira Railway Extension Committee that a question of the first importance to the Colonists themselves will be of no little interest in the Home Country, and particularly to Members of Parliament and the English Press.

It was considered that no more faithful and useful account of the Rhodesian railway question could be given than by reprinting, *in extenso*, the local newspaper accounts of the various public meetings held in Salisbury on the subject, and this course has, therefore, been adopted by the Committee.

In publishing the whole of the newspaper reports, the Committee do not, of course, necessarily endorse every individual expression of opinion therein contained, but they wish to point out that the resolutions themselves were, without exception, carried unanimously, and have met with the full approval of all classes in Rhodesia.

J. H. DEARY, *Chairman.*²

W. E. FAIRBRIDGE, *Hon. Sec.*

**Salisbury, Rhodesia,**

*December 12th, 1895.*
BEIRA RAILWAY EXTENSION COMMITTEE.

Chairman:
H. J. Deary, Esq., J.P. (Deary and Co., Salisbury), and Elective Member of Town Board.
G. D. Bates, Esq., Elective Member of Town Board.
Stamford Brown, Esq., Manager, Bechuanaland Trading Association, Salisbury.
M. A. Freeman, Esq. (Tennant and Freeman), Salisbury.
E. E. Homan, Esq., J.P.
Captain Hoste, Managing Director, Holton Estate Gold Mining Co., Ltd.
J. Boyd King, Esq. (King, Williams and Co.), Salisbury.
F. G. Lowe Esq., Managing Director, Scottish African Corporation, Ltd., &c.
Frank Mack, Esq. (am Ende and Mack), Managing Director, French South African Development Co., Ltd., Salisbury.
A. J. McLaurin, Esq., Government Member of Town Board.
E. W. Meyer, Esq., Mining Engineer, Salisbury.
M. Muirhead, Esq., Salisbury.
Wm. Smith, Esq., Commissioner, Mazoe Development Co., Ltd., Salisbury.
W. Steele, Esq., Salisbury.
R. G. Snodgrass, Esq. (Snodgrass and Mitchell), Salisbury.
L. Susman, Esq., Managing Director, Salisbury Reef Gold Mining Co., Ltd.

Hon. Secretary:
W. E. Fairbridge, Esq., J.P. (Resident Director, Argus Printing and Publishing Co., Ltd.), Elective Member of Town Board, &c. /
A PUBLIC MEETING was held at the Masonic Hotel, on Friday night, to discuss the attitude of the British South Africa Company with regard to the extension of the Beira Railway. The hall was filled almost to overflowing, the meeting being fully representative, and embracing every class of industry in the country. The meeting was called for the purpose of passing certain resolutions, and as these resolutions are of considerable length, they are inserted here as being more convenient for reference, together with the names of their respective proposers and seconders.

Resolution 1. – Proposed by Mr. W. E. Fairbridge, seconded by Mr. Brown:–

That this meeting desires to emphatically impress upon the British South Africa Company the absolute necessity for immediately extending the Beira Railway to Salisbury, the utter inadequacy of waggon transport from Chimoio proving an effective bar to the development of all industry in the country.

Resolution 2. – Proposed by Mr. W. Smith, seconded by Mr. E. Meyer:–

That in the opinion of this meeting, representing all interests in Eastern Rhodesia, the immediate construction of a railway is of paramount importance, for the following reasons:–

(a) Notwithstanding the extension of the line to Chimoio, it has been abundantly proved that waggon transport, even under the most favourable circumstances, between Chimoio and Salisbury, and especially in the low-lying country east of Umtali, has been wholly unsatisfactory, while now, owing to various causes, all traffic has ceased, and no relief promises in the immediate future.

(b) Owing to the above causes it will be utterly impossible to / convey to the various mining centres the enormous quantity of heavy mining machinery and material which must be sent in before an output from the mines
can be expected; and it is a well-known fact that the shipments of a very considerable amount of mining machinery have been countermanded.

(c) In the absence of railway communication, and under existing circumstances, the farming industry is seriously hampered, and it has been found unremunerative to import blood-stock and agricultural machinery.

(d) At the present rates from Beira to Salisbury, viz., £50 per ton, the cost of living presses heavily upon all wage-earning classes.

(e) While the cost of bringing goods to Salisbury remains at this figure, transport being even then extremely uncertain, the projected developments in building operations in Salisbury, which are very considerable, have been entirely stopped.

Resolution 3. – Proposed by Mr. Bates, seconded by Mr. Grimmer:

That this meeting does not consider it necessary to do more than mention the very obvious fact that a railway from Beira is the proper and natural highway into this country, and, moreover, presents no engineering difficulties in construction. This meeting, therefore, desires to ask the British South Africa Company whether they intend to proceed at once with the building of the Beira Railway to Salisbury; and if not, whether they are prepared to sanction its construction by private enterprise, as it is well known that in the latter event adequate capital would at once be forthcoming.

Resolution 4. – Proposed by Mr. Snodgrass, seconded by Mr. F. G. Lowe:

That a committee be now appointed to lay before Mr. Rhodes the foregoing resolutions, and that this meeting stand adjourned until this day week to receive the report of the committee and its answer from Mr. Rhodes.

At the commencement of the meeting Captain Hoste proposed that Mr. H. J. Deary be chairman, which proposition was hailed with acclamation. On the platform with Mr. Deary were the following gentlemen:– Messrs. Stamford Brown, W. Smith, E. Meyer, G.D. Bates, W. Grimmer, R.S. Snodgrass, F.G. Lowe, J. Edmonds, Steele, Muirhead, and W.E. Fairbridge.

The Chairman, on rising, said: Gentlemen, – It is now about eighteen months ago since we had a meeting here in connection with the extension of the Beira Railway. At that meeting we gave a very emphatic utterance as to what our views were with regard to this extension, and as a result of that meeting we obtained the present railway to Chimoio. I hope, however, that the result of tonight’s meeting will be that we get the railway, not merely extended to Umtali, but right up to Salisbury. (Cheers.) As, perhaps, you are aware, the Chamber of Commerce has taken this matter in hand, and for some time past has been in correspondence with the Government, but the response we received from the / Government has been anything but satisfactory. In reply to our last request
on this subject we received the following reply from the Administrator at Buluwayo:

Frank Mack, Esq., Salisbury.
Beira Railway, Extension.

Sir, – In further reference to your letter of the 31st July last, covering petition signed by the inhabitants and ratepayers of Salisbury praying for the extension of the Beira Railway to Salisbury, and to my reply thereto of 11th August, I have the honour to state that this petition was duly laid before Mr. Rhodes, who now desires me to inform you that it having been considered desirable, from a railway point of view, to first provide a better base from which to work the railway, and to establish direct communication with the port, arrangements were entered into some time since for a line of railway to be built from Beira to Fontesvilla; and Mr. Rhodes feels sure that the signatories to the petition will recognise the primary importance of thus establishing direct railway communication with the Coast Port.

I have the honour to be, Sir,
Your obedient servant,
Percy S. Inskipp,
Secretary to the Administrator.

Salisbury, 17th October, 1895.

Gentlemen, this reply can only be considered as distinctly unsatisfactory. (Hear, hear.) It simply means putting the thing off for a further period, and I don’t think we can submit to that any longer. (Cheers.) We thought it would be only courteous on our part to advise the Council of our intention to hold this meeting, and the secretary of our Committee wrote them accordingly requesting the honour of their attendance. In reply thereto we received a letter from the Acting Administrator regretting that the members of the Council were unable to accept this invitation; that, although they could not be present, the meeting had their entire sympathy, and they would do all in their power to help on the Beira Railway.

We have taken considerable trouble in drawing up resolutions which we will submit to the meeting in due course, and gentlemen present will be asked for any views they may hold upon the subject. Our object is to give the most decided utterance that is in our power, and I would here take the opportunity of thanking the local papers for the support they have given us on this question. I have to thank the Nugget especially for the various paragraphs which appear in their issue of to-day calling public attention to this meeting. (Hear, hear.) There are speakers before you this evening representing the professional, commercial, mining, and farming interests of this country, and I have no doubt they will be able to throw additional light on the subject. We all know that the country
between Chimoio and Umtali, under the most favourable conditions, can never be fit for transport, and we must keep that important fact before us. With these introductory remarks I will call upon Mr. Fairbridge to move the first resolution. (Cheers.)

Mr. Fairbridge: Mr. Chairman and Gentlemen,—In moving the first resolution, I will not attempt to deal with points which will be treated very fully in the second resolution, but will confine myself entirely to the resolution entrusted to me. This resolution, which is a very brief one, puts the whole thing in a nutshell, and gives the why and the wherefore of our demand for the railway. The plan of the campaign we may have to enter upon before securing the railway is a very difficult one, but I think we can do something if we all pull together and show a determined front. (Hear, hear.) It must be gratifying to all of us to see so many here to-night, and I, for one, am very glad to see this hall so full. The people of Salisbury have ever been a patient and long-suffering community, but when their cup is full to overflowing they can speak, and speak to the point; that is one reason why the Administrator generally has to give in to us. (Hear, hear, and laughter.) Well, if it is necessary to hit at somebody in order to get our railway, I suppose we must hit at Mr. Cecil Rhodes, and here I will point out a difficulty with which we, as the party of opposition in this railway matter, are confronted. There is no doubt the real circumstances directing the policy of the Chartered Company are withheld from us; we are always more or less kept in the dark. Unlike the opposition in a self-governing colony who have in their turn of power been permitted to look behind the scenes, we have had all sources of information closed to us; consequently, when we hit out in self-defence, as we are bound to do, we may hit the wrong man. Nevertheless, Mr. Rhodes is the accepted head of the Chartered Company, so that I do not care very much, nor see that it matters very much, if in hitting out at Mr. Rhodes we should hit the wrong man, or hit at him the wrong way. It is the generally accepted belief here that in Mr. Rhodes' opinion the most important thing is the extension of the Cape Government Railway northwards, and that the value of that railway would be greatly depreciated if the Beira Railway was completed first. Well, Mr. Rhodes may have had a hand in delaying the railway for various reasons, but we must not forget that he is tied to a great extent. (‘No, no.’) Well, gentlemen, I think I am right in saying that the Mozambique Company have helped to tie Mr. Rhodes' hands. I believe I am correct, if not I hope Mr. Mack will put me right, in saying that a large number of shares in the Beira Railway are held by the Mozambique Railway Company, most of the remaining shares being held by the Chartered Company. When we held our last meeting on this subject the directors of the Mozambique Company created a difficulty, and it is well-known that Mr. Rhodes had to lend the money for that extension out of his own pocket. Whether Mr. Rhodes' hands are tied or not there are other persons connected with the Chartered Company to whom
we can apply pressure in case of need. I refer to the Home Directors of the Chartered Company. (Hear, hear.) Mr. Rhodes cannot do everything for everybody, although he can do great things: he has to keep in touch with the people of Cape Colony as well as the people of Great Britain, and between these two we seem to get left out in the cold. The Home Directors, however, are not tied in any way, and, if they please, can command the money and power to extend the railway at once. As we know, this country is one in which certain groups of home speculators have very great interests, and if everything else fails we can make things so unpleasant for them that they will be compelled to yield, if only for the sake of peace; and in hopes of getting money out of the country in which they are so largely interested they will naturally wish to give the country a fair name. It will not do for them, nor the Chartered Company, to fight this question to the bitter end; and I feel confident that we shall get this railway, though possibly not without the Chartered Company being given to understand that we are prepared to go to any length in order to achieve that object. The urgency of our situation gives us no choice; but I don’t think that Mr. Rhodes or the financial groups at home are prepared to see us go to extremes, and therefore I venture to prognosticate that the battle will result in victory for ourselves. (Cheers.)

Mr. S. Brown: Mr. Chairman and Gentlemen, – I think our case that we are bringing forward to-night is a very strong case, and one founded upon facts from which the Chartered Company cannot escape, and I feel sure when those facts are laid before the Company that we shall get what we want. It has been proved during the last few months that waggon transport is quite unable to cope with the requirements of this country. (Hear, hear.) In a few months’ time the wet season will be upon us, and we shall have no traffic at all. We have always had a grievance in this country, but this present grievance is the greatest of all. If the Chartered Company cannot, or will not, build this railway themselves, we can get it done ourselves by private enterprise. The present rate of £50 per ton for transport entirely prevents the introduction of mining machinery into the country. (Hear, hear.) At the present moment our local merchants are without stocks, our mines without machinery, our builders without material, and, in fact, everything is at a standstill on account of the delay in extending this railway. It is absolutely necessary, if the country is to go ahead at all, that we should have this extension without any further delay. I have very great pleasure in seconding the resolution. (Cheers.)

Mr. Chadwick instanced the effect this lack of transport had had in connection with his firm. On their arrival here some four months ago they expected to find their machinery here before them, but that machinery is still lying at Chimoio, and as far as he could see would be there another four months. Although they had done a certain amount of development work, he had no hesitation in saying they could have done at least five times as much if their machinery had only come to hand as it should have done. (Hear, hear.)
The resolution was then put to the meeting and carried unanimously amidst tremendous applause.

Mr. W. Smith, in moving the second resolution, said: Mr. Chairman and Gentlemen, – In laying these very important resolutions before the meeting I think our task is very much lightened by the fact that no argument is needed to support them. We are all agreed, I believe, that without a railway this country runs a very great danger of having its brightest prospects blighted, and the development of its resources indefinitely delayed. I will refer very briefly to the various sub-sections of the second resolution, a cursory reading of which may not have impressed them sufficiently on your memories. Section A emphasises the fact that even in so-called good times, when oxen are fresh and well fed, and grass and water abundant, the roads in good condition and rates at their normal figure of 15s., waggon transport is wholly unsatisfactory. I hardly need to dwell upon this before a Salisbury audience. We have all had our little experiences, which have clinched that fact in our minds, but this section goes on to show that transport has now utterly broken down, just when our needs are greatest, and we have no assurance of any improvement in the future. Section B of the resolution deals with the effect which the present state of affairs is having on what must be considered our staple industry, i.e., the mining industry, in the prosperity and success of which the whole country is bound up. It is hardly necessary to detail to a mining audience the difficulties which the absence of effective transport has entailed upon us in the past. I would rather look forward and ask you how you conceive it possible for the development of our mining properties to be carried on under the existing circumstances? How is it possible for heavy machinery to be moved along our roads from Chimoio to the surrounding mining centres when it is next to impossible to provide transport for a box of matches? (Cheers.) I will not touch upon Section C, as this will be dealt with by a gentleman more capable than myself. Section D appeals to the purses of almost the entire community. I have just been informed that the hotel proprietors intend to seriously increase their charges, and who can blame them? (Sensation.) The question we shall have to face very shortly will not be so much what we shall pay, but what we shall eat! (Hear, hear.) In a similar way Section E refers to a matter which must have struck every inhabitant of Salisbury. You have only to take a walk anywhere about the township to see the numerous fine buildings standing unfinished for want of material, and if work is stopped there inevitably follows a stoppage of wages, with all its consequent hardship and misery. (Cheers.)

Mr. Meyer, who seconded the resolution, said: Mr. Chairman and / Gentlemen, – After the able manner in which the previous speakers have dealt with this question, I don’t think I can enlarge to any great extent upon what they have said. We all seem to be agreed that the prosperity of the country depends entirely upon the arrival of the Beira Railway, and Mr. Brown stated that we were
at present paying for transport at the rate of £50 per ton. Does anybody realise what this means? It means that to distribute machinery, &c., to the various mining districts this cost of £50 per ton becomes trebled! It means that instead of there being labour in this country for thousands of miners, the only men who are engaged in that occupation are a few prospectors preying on the gullibility of the British public! (Cheers and laughter.) We all know, or at least we all believe, that the mines in this country promise very great returns in the future, and I don’t think many of us would be here unless we did think so. (Hear, hear.) As a mining man for over sixteen years in all parts of the world, I can say that I have never been in a country which promised so well as this country, with one exception – I refer to the want of a railway. (Cheers.) In conclusion, I heartily second Mr. Smith’s motion that not only the mining industry, but other industries and the success of the whole country, depend entirely upon the speedy arrival of the railway. (Cheers.)

Mr. Edmonds, who spoke in support of the resolution, said: I would like to make a few remarks from a farmer’s point of view. There is no doubt we have a grand farming country here, but unfortunately we have to labour under very great disadvantages. There are many enterprising men who have spent a lot of money in importing blood-stock and cattle into this country, but only in one instance has the experiment met with the least success. Not only is the difficulty of introducing live stock into the country very great, but it applies equally to agricultural machinery. Speaking from my own experience as a farmer, I affirm that under the existing circumstances it is hopeless to attempt to bring any machinery up here. We have other difficulties to contend with, such as the locust plague, and last, but by no means least, we have the very serious difficulty which exists in obtaining native labour. There are few men, unless they have been in the country a long time, who really know how much this question of native labour affects us. The natives in many districts are starving – in fact, in some cases are already receiving Government assistance – and unless some scheme is devised without much delay whereby food can be brought up, matters will soon reach a climax. The Government accept the responsibility of feeding these natives, and, taking a very moderate estimate, it would require at least fifty bags of meal a day to do this. How are they going to meet this responsibility? It is in their own interests that this railway should be extended at once. Half a loaf is better than no bread; and if they will not give us the railway up to Salisbury, they might at least extend it to Umtali. (Cheers.)

Mr. Boyd King said: We have heard the weighty remarks of the gentlemen who have proposed and seconded this resolution, and I think most of us agree with those remarks. I do not, however, at all agree with Mr. Fairbridge and other speakers that this meeting will bring about the desired result. We must fight it out to the bitter end, and, if necessary, appeal to the Imperial Parliament, not merely
to extend the line to Umtali, but to Salisbury itself. (Hear, hear, and cheers.) One of the speakers has just said that half a loaf is better than no bread, but if the loaf itself is no larger than this – (here, amidst tremendous applause and laughter, Mr. King produced a most diminutive loaf) – I think we shall fare very badly on the half-loaf. (Cheers.) Gentlemen, I would propose that this loaf be sent to the Chartered Company – (cheers) – or even to the Imperial Parliament, as showing what the people of Mashonaland have to put up with, and what little value we get for our money when we have to pay a shilling for an article like this. (The cheering here was so vociferous that the speaker was obliged to pause.) In supporting this resolution I would conclude with the remark that we must not be content with mere prognostications. (Loud and continued applause.)

Mr. Richardson was in favour of a petition being drawn up. The local papers were very good, especially the *Nugget* with its pictures – (laughter) – but he contended that the people at home would never believe they had had such a meeting as was being held that night.

The Chairman pointed out that a petition had already been sent in, and a most unsatisfactory reply, which he had referred to in his opening remarks, had been received.

The resolution was then put to the meeting and carried unanimously.

Mr. Bates said: Before attempting to deal with the third resolution, I will refer to a trip I have just had down to Chimoio. The road from Umtali to Chimoio is simply lined with dead cattle, the stench being something awful in some places. It has been computed by reliable transport riders that close on one thousand head of cattle have been lost on that portion of the road alone during the last two or three months. We all know what that means: that the money to replace these cattle has to come out of this country. Amongst other heavy losers in this direction I may mention Messrs. Symington and Co., coach proprietors, who in this period have lost no less than 150 cattle. It has been stated that this year has been an exceptional one, but this is not the case. In 1893 I, personally, lost over 80 per cent. of my cattle, and there were others besides myself who suffered in an equal degree. I know of two men who were transport riding down there at that time – they may even be present here to-night – who can corroborate this statement.

It has been clearly demonstrated that the country between Chimoio and Umtali, under any circumstances, is totally unfit for transport. I don’t think anyone will deny that the welfare of Mashonaland is entirely bound up in the efficiency of the eastern route to Salisbury, and that efficiency can only be gained by the railway from Beira being extended. (Hear, hear.)

Dr. Harris, speaking in Cape Town on July 10th, 1894, in support of a railway between Kimberley and Bloemfontein, said ‘that such a railway would make food stuff cheaper in Kimberley, and that both Kimberley and Bloemfontein
would mutually benefit thereby. If the Cape Government and the Free State Government were both unwilling to build it, why not give out the construction to some reliable, responsible, and trustworthy contractors, who would only be too ready to take the matter up.' Well, gentlemen, as Mr. King has just said, we want to get food cheaper, and with food cheaper other things will become cheaper also. It has been said that the Beira Railway would not pay, but this is argued by those who are opposed to its construction. There is, however, a railway about to be constructed, from Mafeking to Buluwayo, which these same people assert is going to pay: but if this latter railway is going to pay, with its length of 1,400 miles (from Cape Town), surely the shorter one, from Beira to Salisbury (400 miles), should also pay, (Hear, hear.)

As regards the proposed railway from Beira not being able to pay, and the difficulties of construction, &c., the following is rather interesting: Not so very long since an expedition was sent out from England under the charge of an eminent engineer, who has constructed railways in different parts of the world, with instructions to survey the country from Beira towards Salisbury, and to advise as to the feasibility of building this railway. His opinion was an exceedingly favourable one, although (presumably on this account) his reception from Mr. Rhodes was anything but a cordial one. Nothing daunted, however, this gentleman returned to England, and later on his people submitted a scheme to the Chartered Company, with reference to the construction of a railway, the railway we are now agitating for, but the scheme was utterly rejected by the Company. There is a gentleman at present in Salisbury whose friends, since then, have offered £300,000 towards the construction of this railway, but this offer also the Chartered Company declined to accept. I do not hold with Mr. Fairbridge’s opinion that Mr. Rhodes is not entirely responsible for the delay in the extension of the line. Mr. Rhodes is the one man who looms out head and shoulders above everyone else in connection with the Chartered Company, and he is the one man we have to fight against. (Cheers.) As regards the Home Directors of the Company, these gentlemen have both a political and social position to maintain, and they would not, I think, sanction a scheme to keep back the welfare of Mashonaland. Had Mr. Rhodes ever had the slightest idea of obtaining a railway from Beira he could have accomplished it long ago, and I contend that Mr. Rhodes is, first and last, the one man responsible for the present state of affairs in this country. (Cheers, and a voice ‘He’s making the oof all the same.’)

The manner in which the people in this country have been fooled and humbugged by the Chartered Company from the very beginning is, to say the least, decidedly unscrupulous. We all know how, three or four days before the recent sale of stands at Umtali and Salisbury, the report was spread about that we should have the railway, and then immediately the sale was over the Company informed us that we should not have the railway. The result of this undoubtedly was that stands at
these sales realised far higher prices than they would otherwise have fetched, and although the Government may consider this was only diplomacy on their part it is, in my opinion, very bad diplomacy on the part of a Government when they have to stoop so low as to trick their own people. (Hear, hear, and cheers.)

Speaking at the last annual meeting of the Company, Mr. Rhodes said that if the country needed railways the money could easily be found outside the Chartered Company. We all know that, and so far as the demand for a railway is concerned we have been demanding it for the last three years; therefore Mr. Rhodes with his own words condemns himself. What is the cause – what is the obstruction that prevents this railway being constructed? If it should be, as Mr. Fairbridge states, that the Mozambique Company are causing the obstruction, the best thing Mr. Rhodes can do is to tell us they are in the way, and we might assist him to remove that obstruction. But whatever the reason may be, the people of Mashonaland, who are so much interested in the matter, have a right to know the nature of that reason. Mr. Rhodes has more than once admitted the power of the British people, and it may be as well to remind him that if the British public gave him the charter they can also take it away. (Loud cheers.) We have met with the firm determination of getting what we ask for, and if the Chartered Company still oppose the extension of this railway, and retard the progress of the country, we, the people of Mashonaland, will be prepared to fight the matter out to the finish. I don't think we need have any fear about the result – history will again repeat itself; and if the Chartered Company still oppress the people they will awake one morning – and at no very distant date – to find Mashonaland in the possession of other masters. (Loud and prolonged cheering.)

Mr. Grimmer said: We are trying to put a case to the Chartered Company which is as plain as the fact that a man has a nose on his face. (Applause.) As far as the usefulness of this railway is concerned we have the words of Dr. Jameson, who, of all men, knows what is best for this country. In support of it he, in no uncertain terms, said that the Beira Railway is the natural highway into the country. For any man to contend that this railway should have to wait until the one to Buluwayo is done, whoever that man may be, he must be a born idiot to talk such nonsense. (Cheers.) We don't insist upon the Chartered Company building the railway themselves, all we want is for them to give the necessary permission for it to be built by private enterprise. But if they refuse either to build it themselves or to allow of it being done by private enterprise, then I say we have a right to know the reason. (Loud cheers.)

Mr. Steele, in supporting the resolution, said: I believe the time has gone by when we should beg of the Chartered Company to give us a railway. (Hear, hear.) We are here to stay, and for us to stay it is absolutely necessary for us to have a railway. The time has now arrived when we must demand it, and we must be prepared to do something more than just come to a meeting and pass reso-
lutions. (Hear, hear.) Mr. Chamberlain is compelled to do his utmost for the Colonies as regards the building of railways, &c., and there is one to Uganda now being built. If a railway is going such a distance as this, where it is more than doubtful if it will ever pay, why can we not have one here to Salisbury where it will pay? (Cheers.) It rests with us to give Mr. Rhodes and the Chartered Company clearly to understand that, come what will, we must have this railway. (Applause.)

The resolution was then put to the meeting and carried unanimously.

Mr. Snodgrass: After the eloquent speeches we have heard to-night there is very little left for me to say. I have a resolution to propose which, if carried, will bring things to an issue; and I quite agree with the last speaker that the time has come when we can no longer ask, but must demand. (Hear, hear.) The Chairman informed us at the commencement of the meeting that the Committee had thought it only courteous to send an invitation to the Government members of the Council, and I am very much disappointed to see that the Government is not represented to-night. It would have been only courteous on their part to have had at any rate one representative at this meeting. It would have looked better. (Hear, hear.)

Mr. F. G. Lowe: I have very great pleasure in seconding this resolution. At the commencement of the meeting the Chairman read out a letter from the Council saying that they recognised the importance of our having this railway, and that the meeting had their entire sympathy. I am only sorry they were not present, as I feel sure that, after hearing what has been said to-night, they would have gone home feeling still more how urgent a matter the question of this railway really is. (Hear, hear.) I would express a wish that Dr. Jameson, and even Mr. Rhodes himself, had been present. (Cheers.)

One of the speakers had said that the sooner these difficulties were looked into the better, but have not these difficulties been ‘looked into’ for the last two years, and we are just as far from attaining our object as ever? In that little village London – (laughter) – there is a place called Exeter Hall, and if Khama can go there and pour out his grievances, so can we. (Cheers.) If we cannot get what we want here we must go home to the British public and tell them that the money subscribed for the Chartered Company has been absolutely thrown away. (Hear, hear.) It has been suggested that this loaf be sent to the Chartered Company, or even to the Imperial Government, as showing the difficulties under which the people of this country have to labour. Gentlemen, I would go a step further and suggest that it be embalmed and sent to the British Museum – (cheers) – where it would remain for generations to come as a standing disgrace to the Chartered Company. (Renewed cheers.) The Chartered Company are putting difficulties in our way which effectually prevent our doing any work, and if they continue doing so we must let the British public know that we can no longer continue,
but must shut down all our works. If we take up the matter in this spirit I don’t think either Mr. Rhodes or the Chartered Company will be strong enough to stand against us. (Cheers.)

Mr. Muirhead, in seconding this resolution, said: I took up my residence in Beira just when the railway was started. The papers at the time, I remember, said this was going to be a record railway, and at first I thought they were right for once, but they turned out to be wrong, as they generally are. (Laughter.) At least they were right in one respect – the line did turn out to be a record one, but in a very different way. The reason for the delay in extending this railway cannot be want of capital, for, as we all know, if liberty is only given the capital is ready waiting at a moment’s notice. We are all deeply concerned in this railway – commercial, mining, and farming interests alike are involved – and when we plainly see the volume of trade so greatly reduced, work on the mines being brought to a standstill, and building operations in the township almost entirely suspended for lack of material, we can only realise that in the completion of this railway is bound up the very existence of the country. (Cheers.) I don’t think at this stage we should be justified in going to the British public, but in the first instance should approach the Chartered Company in a respectful manner – (hear, hear) – and if that has not the desired effect, then we can take more extreme steps.

This resolution, on being put, was also declared carried without a single dissentient, and a committee was appointed in accordance with the resolution, consisting of the gentlemen on the platform, Mr. Boyd King’s name being added thereto.

The Chairman: Before closing this meeting, gentlemen, I have to thank you all for the very orderly and serious manner in which you have taken up this subject to-night. I have never yet been present at a meeting in Salisbury where so much determination has been shown, and I think this will have its effect in the right direction. (Hear, hear.) It is a very great pleasure to me – and I am sure it must be a matter of no little pride for the inhabitants of Salisbury – to reflect upon the manner in which this meeting has been conducted. The meeting will now stand adjourned until next Friday night at 8.30 p.m.

A hearty vote of thanks to the Chairman concluded the proceedings, and the meeting broke up shortly after ten o’clock.
BEIRA RAILWAY.
ANOTHER ADJOURNMENT.

November 8th, 1895.

The adjourned meeting with reference to the above question was held at the Masonic Hotel last Friday, before a numerous audience. Mr. H.J. Deary was in the chair, supported by the following gentlemen:– Messrs. G. Pauling (Commissioner of Mines), Captain Hoste, W. Smith, W.E. Fairbridge, Grimes, Snodgrass, Meyer, Bates, Steele, S. Brown, Muirhead, and Edmonds.

The Chairman: Gentlemen, – As you are all aware this is an adjourned meeting from the one we held last Friday, and we have met to-night to consider the reply of the Chartered Company, and to discuss as to what further steps should be taken in the matter. I regret to say that the information I have to lay before you to-night is not as satisfactory as it should be. The Committee received the following letter yesterday from the Secretary to the Administrator:–

Salisbury, 7th November, 1895,

Sir – His Honour the Acting Administrator has much pleasure in forwarding for the information of your Chamber the following telegram which he received from His Honour Dr. Jameson in reference to the extension of the Beira Railway:–

‘Please tell Chamber of Commerce that I have seen Mr. Rhodes and he promises that immediately the Beira Fontesvilla / extension is finished the railway will be proceeded with from Chimoio to Umtali. They will understand that, considering the extension will be finished in three months, it would be absurd to carry rails up now with the defective river transport. It has been arranged that the engineers for the Chimoio-Umtali section shall be sent in February.’

I have the honour to be, Sir,

Your obedient servant,
Percy S. Inskipp,
Secretary to the Administrator.
The Secretary, Chamber of Commerce, Salisbury.

The Committee consider that this letter can in no way be considered a reply to their message, more especially as it is addressed to the Chamber of Commerce. It was not the Chamber of Commerce who forwarded the resolution, but the public of Salisbury, and the Salisbury public have a right to expect a reply. (Hear, hear.) For my own part I don’t think this telegram was meant for this meeting at all. I am under the impression that it is a cross-telegram sent by Dr. Jameson as a ‘sop’ to our last meeting, but arrived too late. The Railway Committee met yesterday afternoon, and as this telegram was not considered to be a reply we
thought it better to wire again to Cape Town. This was accordingly done, and in connection therewith we received the following letter later this afternoon:

Salisbury, 8th November.
W.E. Fairbridge, Esq.,
Hon. Secretary,
Railway Mining Committee.

Sir, – I am desired by His Honour the Acting Administrator to inform you that, in consequence of telegraphic communication with the Colony being interrupted between Mochudi’s and Palla, he fears that it will not be possible for us to receive Dr. Jameson’s reply to the further telegram which was addressed to him at your request in time for your meeting to-night.

I have the honour to be, Sir,
Your obedient servant,
Percy S. Inskipp,
Secretary to the Administrator.

Well, gentlemen, I believe it is a fact that telegraphic communication has again broken down – (laughter) – which might account for the delay in replying to our wire of yesterday, but it does not in any way account for the delay of six days in replying to the resolutions of last week’s meeting. (Cheers.) I will now read the following telegram received from the Advertiser, Umtali, which may be interesting to you as showing the feeling of the people in that district with regard to the Beira Railway extension:

‘Enthusiastic meeting held Umtali Saturday night, when following resolution unanimously passed: That this meeting, representing Manica and Eastern Rhodesia, although recognising the necessity of a comprehensive railway policy for Rhodesia, nevertheless points out, in strongest terms, the absolute necessity for the immediate extension of / the Beira Railway for the following reasons – (1) Total inadequacy of present transport supply for even common necessaries. (2) Exorbitant rates, which have risen from six pounds to twenty-three pounds per ton for seventy miles. (3) The length of time occupied in transit reaching even to two months. (4) The impossibility, even at existing high rates, of obtaining transport on account of the high mortality amongst oxen. The present block of goods at Chimoio amounts to almost one thousand tons, and is increasing every day; some heavy goods, including a large amount of machinery, having been lying there for months. This meeting expresses its extreme dissatisfaction at the apparent indifference of the Chartered Company to the welfare of Eastern Rhodesia, and asks for a definite statement from Mr. Rhodes as to the actual time to be fixed for the commencement of the extension, and would especially
point out that a large number of stands were recently sold in Umtali on the tacit understanding that the extension was to be commenced at once.'

That is Umtali's opinion, and I think we can heartily endorse every statement contained in the foregoing telegrams. I don't think there is any good to be gained by going over old ground, and will bring my remarks to a conclusion. I am sure you will all agree with me when I say how glad we are to see Mr. Pauling here to-night. (Hear, hear.) We have his sympathy in this matter I know, and I will call upon him to tell us what he knows of the Company's real intentions in the matter. (Cheers.)

Mr. Pauling, who met with a most cordial reception, said: Mr. Chairman and Gentlemen, – I did not come here to-night with the intention of making a speech, but I came more because regret had been expressed at last week's meeting that no member of the Council had accepted the invitation of the Committee to be present. Before dealing with the question before this meeting I would like to refer to the telegram received from Cape Town. I think, with Mr. Deary, that this telegram was not intended for this meeting at all, but was sent for last week's meeting, unfortunately arriving too late; and further that Dr. Jameson sent it without having time to consider the real state of affairs, and the proper remedy. (Hear, hear.) I can assure you, gentlemen, that this meeting has the full sympathy of the Council, and so far as I personally have been able to do any-thing to further this railway it has been most willingly done. At the time your resolutions were sent down to Cape Town I pointed out to Mr. Rhodes that if a survey is not commenced until next February, the tall grass and other difficulties would delay the matter six or seven months, and as the engineer, Mr. Mansergh, is practically on the spot, I asked for permission to put him on the work at once. (Cheers.) I think we should have had a reply assenting to this, but the telegraph has broken down. (Laughter.) I will tell you what, in my opinion, is the best course to pursue. The past has gone, and we have not got the railway, so there can be no use talking about what might have been. What we have to think about is how to get the railway up in the shortest time. (Hear, hear.) It would take at least two months to survey sufficient ground to enable them to commence the line. What the telegram says about the Beira-Fontesvilla extension is perfectly true, but that does not, or should not, prove any hindrance. Even supposing the rails required for this Beira Railway extension were ordered now it would be four months before they could arrive from England. This railway, gentlemen, is, as most of you are aware, a peculiar one; there is, perhaps, not another like it in the world. (Hear, hear, and laughter.) It is a very difficult country, and the line will take a considerable time to build. As to the actual length of time that would be required for its construction, this is entirely a question of money, and will accordingly have to be taken into consideration. Until the survey has been taken it is absolutely impossible for the Chartered Company to arrive at an estimate of
what the cost will be. In my opinion the best plan the Company can adopt would be to first complete the survey, and when that is done enter into a contract for the entire line right through to Salisbury. (Loud cheers.) Unless something of this kind is done the Company would get into difficulties and find themselves short of funds. Some people have an idea that the Beira Railway belongs to the Chartered Company, but this is not the case. Some of the money has certainly been found by members of the Company, Mr. Rhodes particularly, and so far these gentlemen have not seen a penny in return; there has consequently been some difficulty in persuading them to put their hands in their pockets a second time. That argument, however, does not apply any longer, and I have no doubt in my own mind that Mr. Rhodes will agree to what I have proposed. As far as the Council is concerned, we are just as anxious to see the railway pushed forward as any of you, so that you may be satisfied that anything you say or wish to forward to Cape Town will not be ‘burked.’ If we can do anything to help you in any way you can depend upon us doing it. (Hear, hear, and cheers.) I don’t think there is anything else I can say, but if any gentlemen present would like to ask any questions I will do my best to answer them. (Cheers.)

The Chairman: Gentlemen, – Mr. Pauling has told us something that we already know – that we have the sympathy of the Council; but he has not told us that we have the sympathy of the Chartered Company. (Cheers.) We must first know whether the railway is to be started at once as, from what Mr. Pauling says, there are no difficulties in the way and there are already competent engineers on the spot. Mr. Pauling has kindly offered to answer any questions put to him, and as it is so very seldom we experience the pleasure of extracting information from a member of the Government I think we should be somewhat remiss if we failed to take full advantage of his offer. (Hear, hear and laughter.) If any gentleman present would like to ask Mr. Pauling any question will he kindly do so?

Mr. Meyer asked how long it would take for the line to be built between Chimoio and Umtali, supposing work was to commence at the beginning of the year.

Mr. Pauling: As I said before, this is purely a matter of money. If the Company choose to pay for it I believe you could have a running line into Umtali within twelve to fifteen months after commencing the work, (‘Oh.’)

Mr. Snodgrass asked, with reference to the wire from Dr. Jameson respecting the Beira-Fontesvilla extension, if Mr. Pauling thought it possible this would be completed in the time mentioned. He understood considerable trouble had occurred between the natives and the Portuguese, and that native labour, already scarce, threatened even greater difficulties.

Mr. Pauling: The permanent way for half this extension is already landed at Beira. There certainly have been difficulties with the natives, owing to their wars with the Portuguese, and I think I am right in saying that the only thing to
prevent this extension being completed within the time mentioned will be the scarcity of native labour. However, as Mr. Lawley, the gentleman in charge of the line, is here to-night I will ask him to explain how matters stand.

Mr. Lawley, who met with a very flattering reception, said: Mr. Chairman and Gentlemen, – When I commenced the Beira-Fontesvilla extension my intention was to get it finished by January, but owing to unforeseen troubles among the Portuguese and the natives which has caused the supply of native labour to become exceedingly scarce, progress has been considerably retarded. I have done everything that was in my power to secure additional labour, but, although I have had men out to a radius of 300 miles, up to now I have only managed to secure 500 natives. However, I still hope to get it done by February. I have no wish to spend another wet season down there, and if for that reason alone, you can depend upon my doing my very best – if it is possible to get it done by February I promise you it shall be done. (Hear, hear and cheers.)

Mr. Fairbridge asked Mr. Pauling if, in his opinion, it would be possible to get the money guaranteed in London now necessary for the extension of the railway to Salisbury.

Mr. Pauling: I don’t think there would be any difficulty at all in doing this, providing no big ‘slump’ takes place in the mean-time. Gentlemen. I would prefer that this reply was not taken down – (loud laughter and cheers) – but my opinion is that if the Chartered Company say they will extend this railway the money could be at once obtained. (Cheers.) The present is about the most favourable opportunity that has yet occurred, or is likely to occur. You have many large mining properties up here which can do nothing until they have a railway, and they, in their own / interest, would also be inclined to help. I don’t think there is the slightest doubt that the money could be got as soon as it is wanted for the railway right through to Salisbury itself. (Loud cheers.)

Mr. Meyer asked if it would not be possible to have the line into Salisbury itself in twelve to fifteen months, or at any rate considerably reduce the time Mr. Pauling had estimated it would occupy to construct the line as far as Umtali. There were railways in America longer than this, and far more difficult to construct, which had been built in a much less time, and he thought that by ‘grading’ they could save a lot of time.

Mr. Pauling: They always come from America – (great laughter) – and tell us what they do there. Whilst admitting that they do things there which are not done in any other part of the world – (laughter) – I would point out to Mr. Meyer that the circumstances in America are very different to what they are here; there is no comparison. In America they have white labour; here we have to depend on native labour, and you all know well enough what the difference is. (Hear, hear.) The great difficulty is in laying the rails. I have had twenty year’s experience in building railways in this country, and my chief difficulty has been
with the platelayers. You can only get a very limited amount done in a day. If you manage a mile or a mile and a quarter a day you are doing very well. In America it is far different, and they can easily get three miles done in a day; but then each man knows his work, and everything proceeds like a piece of machinery. I don’t think there would be any object in ‘grading’ the line to Umtali, but I do think it can be done with advantage from that point; and I would further propose that the section from Umtali to Salisbury be started eight or nine months after the line from Chimoio to Umtali has been commenced, and thus work on both sections at once. (Cheers.)

Mr. King asked if Mr. Pauling could give them an estimate of the time it would take to bring the line right up to Salisbury.

Mr. Pauling: If, as I have just suggested, we commence the work from Umtali nine months after work has been started at Chimoio, I think we might have the line up to Salisbury in two years and three months. To do as I have suggested would, undoubtedly, cost more money, but that should be no object, seeing how important a result would be attained. (Cheers.)

The Chairman: We have just heard that delays are frequently occasioned by the fact of the rails for a two-foot gauge being a special article, and I think that is all the more reason why they should be ordered at once. (Hear, hear.) Then, too, unless we know for certain that the money is forthcoming the question becomes quite an indefinite one, and I would ask Mr. Pauling whether, supposing the money be forthcoming, the whole of the rails of the line, right up to Salisbury, could be ordered at once. /

Mr. Pauling: I have every reason to believe that the money required for the extension to Umtali is forthcoming, but for the extension up to Salisbury I cannot say. I think that the only reason that has prevented the railway being started before now is that a misconception has taken place as regards having the railway to Beira first. With regard to the Chairman’s suggestion that the whole of the rails should be at once ordered, I hardly see that this would serve any useful purpose, as four months after being ordered is quite sufficient to see them landed in Beira, and we should only have too much on our hands at once.

Mr. King asked Mr. Pauling if he considered a two-foot gauge would meet the requirements of the country, where so much mining machinery would be wanted; also whether it would not be practicable to have the line up in less than two years and three months, seeing that Dr. Jameson has given a pledge that the Mafeking line, 600 miles in length, should be completed within three years. (Cheers.)

Mr. Pauling: The two-foot gauge is quite sufficient for the requirements of this country. We have at present on the Beira Railway trucks capable of carrying fifteen tons, and I don’t know of any pieces of machinery that weigh more than that. I think the railway will be quite capable of bringing up all the articles for this country – at any rate for some years to come. With regard to the Mafeking
line, which is between 400 and 450 miles, and not 600 as stated by Mr. King, the country there is much better and far easier for railway purposes than that we are at present discussing. As to Dr. Jameson’s pledge – well, he may have said it would be completed in three years – (laughter) – but that is not my opinion. I think it will take four years to construct. (Cheers.)

The Chairman: I think we ought to thank Mr. Pauling for the kind and courteous manner in which he has met us to-night, and, so far as he personally is concerned, we can only regard his answers as being in every way satisfactory. (Hear, hear.) I am not speaking of him now as a member of the Government, but as a man of experience in constructing railways giving us information. We propose to submit two resolutions, and I will now call upon Mr. Fairbridge to move the first one.

Mr. Fairbridge said they would remember at the last meeting they had given the authorities at the Cape a week to consider as to their reply, when they were to meet again and discuss what steps should be taken. It might seem as if they were departing somewhat from their programme in postponing the meeting, but he thought they would all see how desirable it was that they should do so. If they desired to thrash the matter out in a constitutional manner, – and he did not imagine for a moment they wished to proceed otherwise – they were bound to give the Government the benefit of any doubt there might be, and in this case there was a doubt owing to / the telegraph line having broken down. At the same time he thought it only right that the gentlemen on the platform should ascertain the feeling of the meeting on the subject and, moreover, should not lose sight of their object, which was to obtain the extension of the line to Salisbury. (Hear, hear.) They did not know as yet whether there would be a refusal or not, and although it was proposed to adjourn that meeting their minds were already made up that nothing should stop them obtaining what they wanted in a legitimate way. He begged, therefore, to propose the following resolution:– That this meeting expresses its regret that a week has elapsed without a reply from the Chartered Company, but before taking further action is prepared to adjourn until next Thursday in order to enable the Chartered Company to reply firstly to the categorical questions sent them at last meeting.

Captain Hoste in a brief but vigorous speech seconded the resolution. He thought they were all of one mind on this question, and that if the Chartered Company did not like to build the railway themselves they must get someone else to do it. (Cheers.)

Mr. Grimmer said he had been called upon to support the resolution, which he did very gladly. He thought, however, after what Mr. Pauling had told them that the thing supported itself – that his remarks had in themselves supported all the statements contained in the resolutions passed at the previous meeting. (Hear, hear.) It had been pointed out, on more than one occasion, that
the railway would not only be in their interests, but would also benefit the Chartered Company, and he could only repeat what he had said before that if the Company refuse to give them, or allow them to build, the railway they must give their reason for refusing. (Cheers.)

The resolution was then put to the meeting and carried unanimously.

Mr. Bates said that the resolution he had to propose was one that affected their pockets. If they were to be in a position to fight for the railway they would require money to defray the necessary expenses that would be incurred. With regard to Mr. Pauling’s remarks it was gratifying to learn that the line to Umtali would not take longer than fifteen months, although he urged that as being all the stronger argument that it should be pushed on at once. What they wanted from the Chartered Company was a distinct understanding, and that, he contended, they must have. (Hear, hear.) Seeing that it was well known that the part of the country which proved so fatal to cattle was that between Chimoio and the Border, he would like to ask Mr. Pauling how long it would take for the line to be carried to that point. He thought it of the greatest importance that that part of the line should be pushed forward with the greatest possible speed. (Cheers.)

Referring to the resolution he was about to propose, he informed them that £105 had been already subscribed by the gentlemen on the platform – (cheers) – and he concluded by asking for their liberal support. He had great pleasure in proposing the following resolution:

That the Committee be empowered to open a fund to be called the ‘Railway Extension Fund,’ to collect subscriptions and expend the moneys as they may consider proper towards the attainment of this object.

Mr. Pauling: I quite agree with Mr. Bates that it is of the utmost importance we should reach the Border as speedily as possible; and once there our chief difficulties would be at an end. It would take six or seven months to do this.

Mr. W. Smith thought that, under the circumstances, they could not have done any different to what was proposed that night. The second resolution would prove how sincere they were in the matter. Money was absolutely necessary if they were to do anything at all, and he hoped the good example shown by the gentlemen on the platform would be well supported by the meeting. (Hear, hear.)

Mr. Meyer said they were called upon to subscribe to what might be called a fighting fund. Everybody had come to that meeting to say they wanted a railway; now it would be seen how much they wanted it. (Laughter.) He had been to many similar meetings before where men spoke bravely enough, but when it came to producing the ‘collateral’ – (laughter) – they buttoned up their pockets; but he hoped it would not be the case on that occasion. If any of them had a sovereign to spare and would not give it towards this fund he thought that man ought to be kicked out of the country. (‘Oh!’ and laughter.) Well, at any rate, he had no right to be present at that meeting. (Cheers.)
Mr. Lamb asked what the Committee proposed to do with all this money, and why such haste had been shown in asking for subscriptions.

Mr. Chairman: Without calling upon the Committee I think I can answer Mr. Lamb. It must be plain to everyone that before prosecuting anything of this kind we must have money. I take it that Mr. Lamb allows the gentlemen on the platform to be men of common sense, and that being the case they are not likely to subscribe £105 unless there is some necessity for it. (Hear, hear.) If there is any body here who does not care to subscribe he need not do so. We do not press anyone to subscribe, the act of their doing so being purely a voluntary one.

The resolution was then put to the meeting and carried unanimously.

The Chairman, before closing the meeting, proposed a vote of thanks to Mr. Pauling for his attendance that evening. They had, he said, received from him some valuable hints, which had been given in a most straightforward way. After drawing attention to the fact that the subscription list was lying on the table, if any gentlemen cared to come forward after the meeting was over, the Chairman declared the meeting adjourned to Thursday, November 14th.

A vote of thanks to the Chairman was passed, and the meeting broke up at 9.30.

[We may mention that many of the audience added their names to the subscription list after the meeting was over, the total amount raised being close on £300.]

THE BEIRA RAILWAY.

ADJOURNED MEETING.

November 14th, 1895.

Held on Thursday evening last at the Masonic Hotel. The following gentlemen were on the platform:– Messrs. H. J. Deary (in the chair), G. D. Bates, Grimmer, W. E. Fairbridge, W. Smith, W. Meyer, Boyd King, Muirhead, Steele and Captain Hoste.

The Chairman: Gentlemen, – Since meeting last Friday evening the resolutions passed at that meeting have been forwarded to Cape Town, and the following reply was received by your Committee yesterday:–
Secretary’s Office, Salisbury, Nov. 13, 1895.
W. E. Fairbridge, Esq.
Hon. Sec.,
Railway Meeting Committee.

Str,—I am desired by His Honour the Acting Administrator to inform you that a telegram has been received from His Honour Dr. Jameson stating that arrangements have been concluded for the immediate survey of the railway extension from Chimoio, and that upon the completion of the survey the earthworks will at once be proceeded with. The necessary instructions have already been issued for the employment of surveyors now on the spot.

I have the honour to be, Sir,
Your obedient servant,
Percy Inskipp,
Secretary to the Administrator.

A meeting of the Committee was at once called, when it was felt that this letter hardly constituted a reply to the resolutions passed at our first meeting. (Hear, hear.) An appointment was made with the Acting Administrator for this morning, when we had a / long interview with him, Mr. Pauling being also present. We explained at this interview that what we wanted — what the public of Salisbury wanted — was a definite reply as to whether the railway right up to Salisbury would be proceeded with at once. (Cheers.) The result of our interview was that His Honour consented to send a very strong telegram to Dr. Jameson, pointing out that the reply was not what the people of Salisbury wanted, and stating that the Railway Committee would not be satisfied unless they had a reply from the Company at Cape Town to the effect that they would proceed with the line from Chimoio at once, and keep on continuously until Salisbury is reached! (Loud cheers.) This the Committee thought was the least they could do, and although we have had all these troubles and delays I really think we should have had a reply in time for this meeting but for the unfortunate break-down of the telegraph wires. Well, gentlemen, this is the present position of matters, and as you will see, it places the Committee in a very awkward position. The question now arises whether, in the face of this telegram received by the Acting Administrator, we had not better delay taking the action we are fully determined upon until we receive the Company’s further reply. Should that reply be unsatisfactory, there would then be only one course open to us, and I need hardly say that we are all of us fully resolved upon taking that course. (Hear, hear.) We cannot hold the Chartered Company blameless in the matter, because the least they could have done would have been to study these resolutions and give us some definite idea of what their intentions really are. (Cheers.) I think the public have behaved in
a very just manner on the subject, and this must be the very last postponement we can possibly make; and whatever reply we receive from Cape Town, whether satisfactory or not, we shall then decide upon our future action. I think our agitation has already had the effect of awakening the Chartered Company to the fact that the public of Salisbury are really in earnest, and that when they ask for a reply they expect to have one. (Cheers.) It now remains for this meeting to decide whether we shall take immediate action or wait for the reply of the Chartered Company – yes or no – when we shall know exactly what to do.

Major Brown said they had had heaps of promises made to them, which had been broken time after time. Mere promises would not bring the desired reduction in the cost of food, clothing, &c., and he thought they had a right to expect something more definite and satisfactory than promises (Cheers.) What guarantee had they to induce them to rely upon this last promise of Dr. Jameson? They were one and all heartily sick of these promises; they wanted something doing, and he contended that a guarantee to this effect should be forthcoming. (Hear, hear, and cheers.)

The Chairman: I am sure, gentlemen, it must be very pleasant to you all to hear Major Brown speak as he has done. I wish Mr. Strachan had been here to-night; he might have given us his views on the other side of the question. (Laughter, and a voice: ‘Where is he?’) As we are having a free discussion on this question I would have liked Mr. Strachan to have been here and tell us something more than he has done in yesterday’s Herald. I do not think it right for a man who holds opinions on a public question to shelter himself behind newspapers – (hear, hear) – and if he is present I shall be very glad if he will come forward, when, if we agree with him, we shall be ready to say so. (A pause ensued, during which it was ascertained that Mr. Strachan was not present.) There is one important point which occurred when discussing the question this morning with the Government, which I omitted to mention before. Mr. Pauling assured us that if the railway was commenced at once as stated in Dr. Jameson’s telegram the line could be laid through the very bad country – i.e., forty miles from Chimoio – by the 1st of July next year. If we had the railway up to that point on that date it would help us a great deal; and if we got a definite promise from the Government for the continuous extension of the line to Salisbury we should in the meantime, I think, have a far better chance of getting our goods up from Beira and Chimoio than at present. This, however, should only make us the more anxious for the work to be carried on without intermission until we have the railway to Salisbury an accomplished fact. (Cheers).

Mr. King: I think, gentlemen, this question is much more serious than we apprehend. It is now a fortnight since we first met and passed certain resolutions, and the reply has not been forth-coming as yet, thereby placing us in a most awkward position, when we consider the threats held out in these resolutions.
(Hear, hear.) Seeing that that meeting was so unanimous in its decisions, it was all the more difficult to understand why the Chartered Company have ignored it so long; and as it is not the first time such appeals have been entirely ignored by the Company, some explanation, I think, is due to us. (Cheers.) However, we shall in a few days have received a definite reply one way or the other, no doubt containing further promises from the Company. Notwithstanding this, I think we should still keep up the agitation. We cannot get away from the fact that our resolutions of November 1st have so far been entirely ignored, although there has been ample time given for a reply. It may be, of course, that the Company consider they have some good reason for not extending the railway, which has accounted for the delay, but if this is so the least they could have done would have been to state that reason. (Hear, hear.) I think, therefore, in giving the Chartered Company another chance of definitely answering these resolutions, we ought to understand that it is the very last one. (Loud cheers.)

THE CHAIRMAN: I am sorry to say that Mr. King is rather out of order, as he has somewhat anticipated the resolution we have to bring forward, although I did not like to interrupt him, as we know he generally speaks to the purpose. I will now call upon Mr. Bates to move the resolution.

MR BATES: To a certain extent I agree with Mr. King that delay is dangerous inasmuch as we have nothing to gain by it and have everything to lose. Still, in asking you to adjourn this meeting until a definite reply is received, I think the Committee are perfectly right, as it would be most unwise for us to rush ahead until we know where we are. (Hear, hear.) It is very probable that the telegram sent down to Cape Town this morning will not only show the Company there that we are determined to go on with this matter if necessary, but will also bring a definite reply one way or the other. With regard to the interview the Committee had this morning with the Government, it was a great pleasure to us to be treated so courteously as we were by the two gentlemen who at present represent them in Salisbury. (Hear, hear.) Quite different to the old time attitude of indifference that was assumed by members of the Council. We all remember the off-hand manner of that Administration, such as cigarette smoking, the use of slangy expressions, and so forth. (Laughter.) The local Government deserve well of us, but for that ‘absentee’ Government, I ask how it is possible for us to respect them? (Cheers.) It is very essential that we should have the extension from Chimoio commenced at once, seeing that Mr. Pauling has informed us it will take six or seven months to get beyond the ‘deadly’ strip of country. We are all expecting, and with some reason, a considerable influx of people into the country next year, and I think you will have a very great difficulty in finding transport riders who will attempt that part of the road, notwithstanding the high rates of transport. The question already staring us in the face is, can we afford to pay those high rates for another year? I don’t think we can. (Hear, hear, and cheers.)
The Committee are strongly determined to carry the matter forward if need be. Unfortunately there are men on the Committee who are 'laggards,' and I think they ought to retire in favour of better men – (hear, hear.) – they keep very much in the background while the real work is being carried on, although they do not object to reap whatever benefits may be gained. We have to pull the chestnuts out of the fire for them to eat. I would not have made these remarks, gentlemen, but for the fact that we must have the Railway Committee in existence until we have the railway into Salisbury, and it is therefore of the utmost importance that our Committee should be composed entirely of men who are willing to take their fair share of the work. (Cheers.) Most of us have been in the country several years and have spent a considerable amount of money in it. What have the Chartered Company given us in return for our money? (A unanimous cry from the audience: 'Nothing!') Nothing, as you / all say. The motto of the Company is 'Justice, Freedom and Commerce.' Up to the present we have had very little of any of these. (Hear, hear, and a voice: 'They ain't got no justice'.) Justice is what we are here to-night to obtain. With regard to Freedom, there are several members of the Government who are quite willing to allow us full freedom, but the Cape Town section – the 'absentee' Government – are not willing and, in fact, not only refuse us freedom, but do their utmost to retard our Commerce! (Cheers.) We have now met three times, and up to the present have done nothing more than endeavour to persuade the Chartered Company to extend this railway, and this persuasion is still going on; but whether it will be continued any longer depends entirely upon the answer we receive. (Cheers.) I have very great pleasure in proposing that this meeting stand adjourned until such time as a definite reply has been received.

Mr. Muirhead: At the beginning of this agitation we made a request for the railway to Salisbury itself, and the Chartered Company have met us half-way in promising to make the survey, and push the line on to Umtali, but the Committee are determined not to relax their efforts until it is brought up here. For my own part I think the reply we are waiting for will be a favourable one, as I cannot conceive how they can possibly delay the matter any longer. (Hear, hear.) The capital of the Company is enormous, and it has assumed a position of almost international importance; that being the case, I don't see how, in their own interest, they can hold out much longer. Now that we have brought pressure to bear upon the Company I think they will give way, and as a few days do not matter very much I don't see how we can do better than wait for the last time, for a definite reply. Should this reply be unfavourable we can then take decisive action. (Cheers.)

Mr W. E. Fairbridge: Things have gone in rather a contrary direction to that anticipated by your Committee, and consequently they have been prevented from taking the steps they had at first contemplated. The position your Committee are in is a somewhat delicate one. When interviewing the Gov-
The Beira Railway

Government this morning we were accorded details concerning the Beira Railway Company which it would not be proper to divulge on this platform. You will quite understand, I am sure, why this should be. We need only remember that even in England, which is practically ruled by the people who are masters of even the Cabinet, information at times comes to those charged with carrying on the business of government that would perhaps be very interesting to their constituents, but which it is improper to use for publicity. So it is in a smaller degree with your Committee as regards the interview they had with the Government, but, although I am not at liberty to state the exact nature of that information, I may tell you that it was not of a very remarkable or private nature. It was quite sufficient, however, to show us the practical difficulties in connection with this railway under which the Chartered Company are labouring, and the position Mr. Rhodes is consequently placed in. Still, gentlemen, I am of opinion that these difficulties are more or less of the Company’s own creation in the earlier days – (hear, hear, and cheers), – and are of such a nature that if the Chartered Company cannot remove them by themselves now that they know the railway must come, I say that the public of Salisbury would be doing them a very good turn in appealing to the British Government to lend the Chartered Company a hand, and showing our rulers generally that these difficulties must be removed at any cost. (Loud cheers.) With regard to what Mr. Bates has said in respect of the lack of courtesy and indifference, &c., he alleges on the part of previous members of the Government resident in Salisbury – special reference being made to Dr. Jameson – I must, in this one matter, disagree with Mr. Bates, and I think his remarks might have been left unsaid. While allowing, for the sake of a contrast between the present and past members of the Government of Salisbury, that Dr. Jameson certainly seemed to take things easily, I contend that he was always courteous and well disposed to the public. What we had chiefly to complain about him was that he would never say what was in his mind, and I think this was owing more than anything else, to the fact of his being essentially a ‘Rhodesian Imperialist’; that is, he takes questions outside of strictly Rhodesian ones into consideration before our own local wants, although his views on this question were not perhaps so pronounced in former days as we have every reason to believe they are now. (Hear, hear.) Well, gentlemen, no doubt a far-sighted Imperialism is a very fine thing, but we do not look upon it quite so kindly when it begins to affect our bread and butter. (Cheers.) We know now that the mines cannot be worked at a profit under present conditions, and we have arrived at a stage where we must persuade the powers that be to give us, or extract from Mr. Rhodes by some means or other, at a very early date, a guarantee to the effect that this railway shall be carried forward continuously to Salisbury. (Hear, hear, and cheers.) It is not only that the cost of living and working is too high within this country, but the absence of the railway is ruining the name
of Mashonaland among the home investors. One of the things that has been depressing this community and its friends at home, of late, more than any other is a general feeling – whether right or wrong – that Matabeleland is being preferred by politicians at the Cape to the detriment of Eastern Rhodesia. We are, of course, glad Matabeleland is getting a railway, and that it has such good friends, but we object to be left out in the cold and submit to a process of starvation.

If we can obtain a satisfactory assurance from Mr. Rhodes that such is not the policy being adopted – that the Matabeleland line is not being pushed forward with the intention of retarding the Mashonaland line, and that this latter will be pushed on equally fast, then I think we should have won a very important point. (Cheers.) We hope to get a satisfactory assurance, but, gentlemen, I don’t think it unwise to hide from you the course we propose to adopt, in case the reply we receive from the Company is not a satisfactory one. (Hear, hear.) We are in a certain position, and having gone so far we do not desire to draw back now. If the necessity arises, we must, acting in a purely constitutional manner, send or take your grievances home to the Colonial Secretary, and seek the sympathy of the English public. We have a grievance in this:– the Beira line to Salisbury is the one essential to our industry, but instead of that being pushed on, we see a political line being pushed on to suit the Cape Colony more than any one else. As Mr. Muirhead said, the Chartered Company has grown to such an extent, and acquired such influence that its interests have become almost international interests. But my opinion is that no government, however strong and certainly not a government which in form is a commercial company, can afford to let the cry of a deeply discontented people go forth to the world. All said and done, the Chartered Company can exist and flourish only if a white community exists and flourishes. Well, our existence is far from a flourishing one, and the Company will be forced to give us the Beira line sooner than it perhaps intended. I wish to endorse what has been said with regard to the attitude of the two members of the Council who are left in Salisbury, and we, the Committee, were very pleased with the reception they accorded us this morning. These two gentlemen, who, as we know, fully recognise the importance of at once extending the Beira line, have not the powers the Council should have, and consequently are frequently placed in a somewhat helpless position. After five years’ residence, I don’t see how it is possible for this country ever to become prosperous so long as we are governed partly from Cape Town, partly from England, but never from here. (Cheers.) Until we can get real Local Government, or at any rate, have members of the Council vested with sufficient authority, so that it would not be necessary for them to appeal to Cape Town or London on any and every question that could be decided here just as well, or, in other words, feel ourselves free from being made to play ‘second fiddle’; I say that until then we can never really go ahead. (Cheers.) Let us look back and examine the working of the existing régime. Since
1891 we have had no less than four agitations; first, there was the Pioneer Agitation in 1891 – that was of little political moment. Then came the agitation against the 50 per cent clause, and other matters connected with the Chartered Company’s policy. Eighteen months ago an agitation succeeded in extending the Beira line a few miles, and now we are at it again; this time with our eyes open. Tomorrow, I suppose, we shall have to inaugurate an agitation to remove some other equally serious grievance. I think these agitations, which have been found necessary in order to obtain our just demands and keep residents from throwing up the country, constitute a very bad method for getting what we require. (Hear, hear.) We certainly obtain some redress and give people here new hopes, but the agitations do not do the country any other good; in fact, they only tend to alarm investors and frighten away the very people that are wanted in the country; and the sooner the Chartered Company go in for a real system of Local Government the better it will be, not only for Rhodesia, but for the Chartered Company itself. (Loud cheers.)

The Chairman: I would like to say a word with regard to Mr. Fairbridge’s remark about the course the Committee propose to take in the event of the reply being unsatisfactory. I think I need scarcely say that in omitting all reference to this I had no intention of concealing anything from you. I purposely omitted all mention of this particular point, because I do not believe in referring to such unpleasant questions until it is absolutely necessary to do so. (Hear, hear.) As regards the action of our local members of the Government, I must certainly support the previous speakers with reference to those gentlemen, who, so far as they were able, have done everything to help us. (Cheers.) Whatever our opinion may be of what Mr. Bates calls the ‘absentee’ Government, our own local members deserve our heartiest thanks. (Hear, hear.) For my own part I don’t think the time has yet arrived when we can properly discuss the question of Local Government. There is no doubt that the present one is a very ‘fly-about’ kind of Government – in fact, sometimes we hardly know whether we have a Government at all! (Laughter and cheers.) I do think, however, that the time is coming – perhaps not so far distant as it may seem – when we shall have another agitation, not merely as to what kind of Government, but as to what kind of Government we shall have! (Loud cheers.) One more point I would like to mention is the secrecy observed by the Government in dealing with us. I do seriously think that if the Government would only take the people of the country into their confidence a little more, and let them see, if only occasionally, what they are doing, we should not be placed in such a position as we are to-night. (Hear, hear, and cheers)

Mr. Fairbridge pointed out that he did not mean to imply that the Chairman had the slightest intention of concealing anything from them. In saying what he had his sole idea was to let the meeting know that the Committee really meant business. (Hear, hear.)
Mr. Meyer: Several speakers have said that we mean business, and that when we say we want the railway we mean to have it. There is no good in slang-ing the Government. We have had enough / criticisms, and what we want now is the railroad. (Hear, hear.)

We are all paying big prices for everything we eat and for everything we wear, and especially for everything we drink. (Cheers and laughter.) I don’t know the depths of the pockets of gentlemen here, but I do know that my own is limited, and will not wait five or ten years for a railway to come up here and reduce those prices. (Cheers.) With all due deference to Mr. Pauling, I still maintain that there are no engineering difficulties to be surmounted – it is only a tram line after all has been said – (laughter) – and it ought to be done in six months. I am of opinion that an addition should be made to this resolution to the effect that no answer should be accepted as satisfactory unless a specified promise is given by the Company for the railway to be carried forward continuously, to arrive at Salisbury within two years and six months. (Loud cheers.)

The Chairman suggested that Mr. Meyer should bring this forward as a separate resolution to follow the one then under discussion.

Mr. Steele: I am hardly surprised that we have received such a shabby reply from Dr. Jameson, as we are getting used by now to these evasive answers. We all know Dr. Jameson, and are not to be bribed by his drinks any longer. (Cheers and laughter.) That’s all right, gentlemen, but in days gone by you know that when discussing any question with him he would say, ‘This is rather dry talking, let’s have a drink.’ (Loud laughter.) To be quite serious, it is high time we let them know clearly that this reply must be a definite one. There is one point I would like to mention which seems to have been overlooked by other speakers. The Company have promised an immediate survey, and on the completion of the same to erect earthworks at once. We have the authority of Mr. Pauling that a survey will take twelve months, – that is, if it comes right through, but I think after they had surveyed a few miles they might build the line up to that point, by which time there would be another section surveyed ready for construction. (Hear, hear.) If an arrangement such as this could be adopted, it would save a considerable amount of time. (Cheers.)

The Chairman then put the resolution of adjournment to the meeting, which was carried.

Mr. Meyer then proposed a second resolution (as suggested by the Chairman) as follows:—

That the Chartered Company shall state a definite time, not to exceed two years and six months, in which the railway shall be carried right into Salisbury.

This was seconded by Mr. Broadbent, and supported by Major Brown. On being put to the meeting the resolution was carried unanimously amidst tremendous applause.
The Chairman having declared the meeting adjourned until such time as the Committee could call another meeting to finally discuss the matter, the proceedings terminated with a vote of thanks to the Chairman.

**BEIRA RAILWAY EXTENSION.**

**SPEECH BY MR. BYRON REED, M.P.**

*November 29th, 1895.*

**THE QUEEN TO BE PETITIONED.**

A further meeting with reference to the above question was held on Friday last, in order that some decisive action should be decided upon without any further delay, the hall of the Masonic Hotel being again crowded. A pleasant feature of the evening was the presence of Mr. H. Byron Reed, M.P., at present on a visit to this country, who heartily supported the movement in the course of a brilliant speech. The Chairman of the Committee, Mr. H. J. Deary, again presided, supported by the following gentlemen:– Messrs. F. Mack, Captain Hoste, W. Smith, F. G. Lowe, G. D. Bates, Grimmer, McLaurin, E. E. Homan, M. Muirhead, S. Brown, King, Snodgrass, Steele, and W. E. Fairbridge.

The Chairman stated that a fortnight had elapsed since their last meeting, during which time the Committee had hoped to receive a satisfactory reply from Cape Town. That very day they had received a letter from the Secretary to the Administrator on the subject, and just before the meeting started the Committee had received a wire from Mr. Rhodes himself; these would both be read out to them and the meeting would have to decide whether they were satisfactory or not. A very kind wire had been received from Buluwayo, to which the Committee had replied thanking them for their sympathy and had taken that opportunity of pointing out to them that the people in Salisbury had no intention whatever of preventing them having their railway. (Hear, hear.) He thought they were all of opinion that there was plenty of room in the country for two lines of railway. The Committee had also received a letter from the Salisbury Chamber of Mines sympathising with the movement, and he thought they ought to thank them for the same, as in a case like theirs they could not have too much sympathy. It was a very great pleasure to him to welcome on the platform Mr. H. Byron Reed, M.P. for Bradford, who had kindly consented to be present and see what they were doing in this matter, and he (the Chairman) thought that Mr. Reed’s presence would be of great assistance to them. (Cheers) That afternoon the Committee had received the following letter from the Secretary to the Administrator:–
Sir, – With reference to the resolutions on the subject of Railway Extension which were communicated to Mr. Rhodes, I am directed by His Honour the Acting Administrator to inform you that the Beira-Fontesvilla and Chimoio-Umtali Sections are in hand, and that due consideration will be given to the further extension as soon as circumstances will permit. In connection with this subject I am directed to call your attention to the fact that in the case of the railway from Mafeking towards Buluwayo, the contract has only been given out for the first section, namely, as far as Gaberones.

I am, &c.,
Percy S. Inskipp,
Sec. to the Administrator.
The Hon. Secretary to the Railway Committee,
Salisbury.

Later on that day – in fact only about half-an-hour before the meeting commenced – the Committee had received a wire from Mr. Rhodes at Cape Town as follows:–

Re the position as to railway communication, Beira and Salisbury, is as follows: I understand the railway from Fontesvilla to Beira will be completed about February. We have meantime authorised the survey from Chimoio to Umtali, which will be commenced at once, and upon its completion the railway will be extended from Chimoio to Umtali. If the traffic for Victoria, Salisbury, and the country connected with that area warrants its extension we shall then proceed to Salisbury.

He did not think it necessary for him to comment on this correspondence. As the wire from Mr. Rhodes had been received so late the Committee had not had time to deliberate upon it, and had decided to take the opinion of the meeting on the matter. (Hear, hear.)

On being put to the meeting it was unanimously decided that the wire from Mr. Rhodes could not be considered a satisfactory reply. The Chairman stated that the Committee had anticipated their decision and had drafted a resolution accordingly, which he would call upon Mr. Lowe to propose.

Mr. F. G. Lowe said the first thing that occurred to him on reading the telegram from Mr. Rhodes was the remark ‘if the traffic warrants a railway.’ The railway would not make the traffic, but the traffic would make the railway! As they knew only too well, there was plenty of traffic, and if they had a railway there would be quite sufficient traffic to make that railway pay. (Hear, hear.) He had been at considerable trouble to ascertain what goods at the present moment were waiting at Beira and Chimoio for transport, and although it was next to
impossible to get the exact amount he thought his figures were very near the mark. He was informed that at least 600 tons of goods for Salisbury were lying at Chimoio, and an additional 2,000 tons at Beira, all waiting for transport! The people at home, who were so interested in this country, and who had found so much capital for it, were asking them to push ahead and, by making an output, prove to them that this was a good country and that there was gold in it. How were they to do that? It was simply impossible for them to have an output whilst they had to contend with the present difficulties. They had approached the Chartered Company in a respectful and dignified manner as business men and he thought they would do so again that night. (Hear, hear.) They had not come to these meetings to ventilate their own private and individual wrongs, but they had come to assist a patriotic movement, and he appealed to them all to lose sight entirely of their own private interests and think of those people at home who had put their money into the country. What prospect had they of paying to those people at home dividends upon the money they had advanced to enable mining work to be carried on? They knew well enough that mining work had been almost entirely stopped simply owing to lack of transport. They had a very nice book of mining laws – (laughter) – in which they were all more or less interested, and under those laws they were compelled to work under very severe regulations, but unless they could make the mining work pay there was no use in going on with it, and it was impossible for them to make the work pay unless they had the available means at their command. (Hear, hear and cheers.)

The Right Hon. James Boyce, late President of the Board of Trade, who had recently made an extended tour in South Africa, had expressed the following opinion with regard to the Beira Railway:– ‘At present, what was most wanted was quicker and cheaper transport. Desirable as it was to carry forward the line from Mafeking to Buluwayo – and he was glad to hear a beginning had already been made with the first section from Mafeking to Gaberones – the completion of the Beira line was no less called for. When at Fontesvilla he was told that in four months the line from that place to Beira would probably be complete. This ought evidently to be followed up by carrying the railway from Chimoio right to Umtali. Three weeks ago, when he was there, there was practically no transport beyond Chimoio, for the locusts had destroyed the grass, and waggons could not proceed. The loss of oxen had been very heavy.’ It was very nice (Mr. Lowe continued) to have the support of a gentleman of the experience of Mr. Bryce, and who occupied such a high position in England, When Mr. Bryce was here a few weeks ago he had been very greatly impressed with the prospects of the country, and had been strongly of opinion that if only proper means of transport were at hand the country would go ahead at once. This opinion Mr. Bryce had said he was prepared to take home with him. (Cheers.) In the letter from the Secretary to the Administrator there was a clause which he was very sorry to see,
reading as follows:— 'In connection with this subject I am directed to call your attention to the fact that in the case of the railway from Mafeking towards Bulawayo, the contract has only been given out for the first section, namely, as far as Gaberones,' He thought it was very unfortunate that this should be dragged into the discussion at all, and for his own part he failed to see in what way it had any reference to the question they had under consideration. (Hear, hear.) Their meetings had been held with the sole intention of obtaining the extension of the Beira Railway to Salisbury, and had no reference whatever to the Mafeking line. They never had the slightest intention of preventing the extension of the Mafeking line, and he thought, therefore, that this clause might very well have been omitted. (Cheers.) When he was in Buluwayo a few days ago he found there was a very strong opinion prevalent there that Salisbury was trying to prevent the extension of the Mafeking line to Buluwayo. (Loud cries of 'No.') Well, as he had said before, it was a very mistaken impression, and most unfortunate that it should have been raked up at all — (hear, hear) — but he had explained to the people in Buluwayo as fully as possible that there had never been any such intention on the part of Salisbury — that so far from wishing to prevent the Mafeking extension being carried into Buluwayo, the people of Salisbury were very glad to hear of it, and had wished it every success. He thought that the people of Buluwayo understood now the real feelings of Salisbury on this particular subject, and, now that they did understand those feelings, had expressed their sympathy with the object of that meeting. (Loud cheers.) It had been a very great pleasure to him to read the very strong and able remarks in Messrs. am Ende and Mack’s circular with reference to the Beira Railway extension, and he thanked them most heartily for those remarks. (Hear, hear.) For his own part he wrote home to his friends very fully on the subject, and had repeatedly pointed out to them that there was a prosperous future before the country, but not until such time as they had the railway they were asking for. (Cheers.) The course suggested by the Committee was, he felt sure, the only one they could act upon. They had gone to the Chartered Company and told them that it was absolutely necessary for the welfare of the country that they should have this railway, and as the Chartered Company had not taken any real notice of their request, they had no alternative but to go to the fountain head and ask for the assistance of the Colonial Secretary and the British public in order to obtain their just demand. (Cheers.) He had very great pleasure in proposing the following resolution:—

That, as the Chartered Company have made no satisfactory reply / to the resolutions passed by the public of this province a month ago requesting a definite statement of its intentions with reference to extending the Beira Railway, this meeting, representing all sections of the community, considers public opinion is being ignored by the Government, and is resolved to petition Her Majesty the Queen upon the subject of its grievance, and hereby authorises the Railway
Extension Committee to draw up and to have signed and forwarded such petition through the proper channels.

Mr. McLaurin, in seconding the resolution, said he would like to make one remark with regard to the paragraph in the telegram from Mr. Rhodes, which stated ‘if the traffic warranted the extension, &c.’ He thought that when it was a matter of such great difficulty – at times almost an impossibility – to obtain sufficient transport for food-stuff alone, there could be no doubt whatever as to the traffic warranting a railway. (Cheers.) That was the first meeting on this question he had attended, and he had been greatly struck with the very serious manner in which they had come forward to support the efforts of the Committee.

Mr. H. Byron Reed, M.P., who was accorded a most enthusiastic welcome, said: Mr. Chairman and Gentlemen, – It is with very great diffidence that I address this gathering. I am here a stranger and a visitor, an impartial witness of the proceedings, and I should have preferred to take no part in this discussion. However, as I have been in South Africa nearly two months, and have seen and heard a great deal whilst in the country, I feel impelled to speak when asked to do so. I have no right to speak on behalf of the House of Commons or Her Majesty’s Ministers. I am only a humble member of the House of Commons, representing some thousands of working men in the North of England, and have neither the position nor influence of my colleague, the Right Hon. James Bryce. At any rate, I am an Englishman – (cheers) – and I may be permitted to lay aside my political character for a brief space, and say a few words on this subject. I must say that I am very greatly impressed with the strength of feeling which prevails in this city with regard to the extension of the Beira Railway, and I am quite prepared to convey that feeling to the proper authorities at home so far as it is in my power. (Loud cheers.) In my opinion railways are absolutely necessary for the extension of commerce and prosperity in every country, but especially in new countries, and I am certainly at one with the gentleman who proposed the resolution, when he said that the traffic would make the railway. In my somewhat limited capacity, I have found, whilst in this country, that it is a very difficult matter to obtain even the simple necessaries of life, and that difficulty is owing entirely to one things, the lack of efficient transport. (Hear, hear and cheers.) I have heard the same reply given time after time with overwhelming emphasis, ‘Give us transport and we will give you trade.’ I am reminded very forcibly of the time when Mr. Arthur J. Balfour – (cheers) – successfully carried out a system of light railways in the Western parts of Ireland. There the people had no industries, the seas were swarming with fish, and agricultural and dairy produce in any quantity was ready to hand; but they had no facilities for getting them to the markets, as they had no means of communication. Then Mr. Balfour, like the great statesman that he is, saw that the one way to promote Irish industry was to make them railways, so as to bring the industries and products of the working people into communication
with the markets from which they had hitherto been shut out. I want to apply that illustration to this vast country – the same principle to be adopted – and to see that means of communication with the outside world are afforded you. It is from my knowledge of what Mr. Balfour did in Ireland that I stand on this platform and say that I am heart and soul with you in this matter. (Loud cheers.) For over twenty years I have taken an active part in home politics, and have always found myself on the side of constituted authority. I am a Conservative – (hear, hear) – and have sometimes had to fight some very hard battles for that Constitution. My only qualm in appearing on this platform to-night is that I may be accused of turning round and fighting against it; still, although I support constituted authority when it is in the right, I shall never hesitate to speak on the other side, or withhold my vote, when I find it to be in the wrong. (Cheers.) In dealing with constituted authority, you have first to make up your own minds, and, having done that, you must express yourselves firmly, and persevere, and in the long run constituted authority will recognise that you are on its side. I hold that in adopting the methods you have, and in making your representations and passing resolutions, you are carrying out the very essence of constitutional government, and so long as you continue to do this you will find a very warm supporter in the man who has the honour of addressing you. (Cheers.) Your resolution speaks of making representations to the Colonial Secretary of Her Majesty’s Government. In speaking on this particular subject I am treading on somewhat delicate ground, as I am not aware of your exact position and your relations with regard to the Imperial Government, and therefore I speak with even more diffidence than before. I should say that every possible means that honourable men can employ should be exhausted in addressing your properly constituted authorities before taking such steps as those you now propose, which can only be regarded as a last resource, and I take it that you have exhausted every means in your power before deciding upon this course. (Hear, hear.) Imperial authority, to be exercised at all, must be done more from the view of a mediator than of a dictator. I may say also that this petition should be addressed to Her Majesty in person, rather than to one of Her Majesty’s Ministers. Of course, the petition would have to be dealt with by Her Majesty’s Ministers, who are responsible to the House of Commons, and who would have to account to that House for any action they may take in the matter. I can only add to what I have already said, that if, in the course of the next Session of Parliament, a petition from this country should be presented to Her Majesty, by her referred to the Secretary of State, and by him laid before the House of Commons, I shall be only too happy to take counsel with Mr. Bryce (who is my senior, and sits on the opposite side of the House) as to the best means we can jointly take towards securing what you desire. (Loud cheers.) Perhaps before I resume my seat the meeting will permit me to take this opportunity, – probably the only one I may have – of expressing my great admi-
ration for all that I have seen in this marvellous country, I have come here for the first time, but have determined it will not be the last – (hear, hear) – and from all that I have seen and heard, I am every day more and more impressed with the mighty future that lies before it. (Cheers.) When you have overcome such small difficulties as locusts, and managed that your rivers shall not flow too rapidly in one season and not enough in another – (laughter) – when you have overcome such difficulties as these, and secured more British blood and British capital in the country, you will have one of the vastest and most prosperous territories over which the British flag has ever flown. (Loud cheers.) Gentlemen, I am no ‘Little Englisher,’ I am a ‘Big Englisher,’ and I believe that in these great possessions of ours beyond the seas will be found the homes and happiness of generations yet to come; and when I say this I mean English, Scotch, and Irish alike, for thanks to the defeat of the Home Rule Bill, Englishmen, Scotchmen, and Irishmen are still Britons in the truest sense of the word – (cheers) – and when we are all dead and gone, the name of Englishmen will be handed down to posterity as men who feared God, honoured the King, and kept the Constitution. (Loud and continued applause.)

The Chairman said that when that meeting was called the Committee had no idea that they were going to receive the strong support of Mr. Byron Reed. That gentleman had assured them that they had done everything in a constitutional manner, and it would be a great pleasure to them all to receive that information. (Hear, hear.) After Mr. Reed’s very eloquent speech he thought the best thing he could do would be to put the resolution to the meeting without further delay. The resolution, after being altered in accordance with Mr. Reed’s suggestion so as to read ‘Her Majesty’ instead of ‘Her Majesty’s Secretary of State for the Colonies,’ was then put to the meeting and carried unanimously.

The Chairman then asked the audience what their intention was with regard to the reply the Committee were to send to Mr. Rhodes, whether they would themselves decide upon the reply or leave it in the hands of the Committee. /  

Mr. Main said that at the last meeting a vote of confidence in the Committee had been passed, and he thought they could not do better than let that vote stand and leave the matter of a reply entirely to the Committee. (Hear, hear.)

Mr. Lamb briefly seconded the resolution, which was carried accordingly.

The Chairman said that before the meeting dissolved he would like to say a few words with regard to finance. He had been somewhat misunderstood at a recent meeting, and he wished to remove any misunderstanding that might exist. In the first place the work of the Committee had increased to such an extent that the hon. secretary, Mr. W. E. Fairbridge, could not continue it any longer, and the Committee had decided that the Board of Executors should act for them in the matter. He wished, therefore, to inform them that all subscriptions would be received by Mr. Eustace, and when the proper time arrived a balance-sheet
would be issued showing exactly how the money entrusted to them had been spent. Naturally, at that stage the Committee could not say how the money would be spent, but he thought they could trust the Committee to expend the money in such a manner as would be best calculated to further the interests of the movement they had at heart. (Hear, hear.)

The meeting then dissolved. / 

THE REPLY TO MR. RHODES.

The following is an exact copy of the reply forwarded to Mr. Rhodes by the Railway Extension Committee:—

Secretary Railway Committee. Rhodes, Cape Town.

Your telegram arrived here a few minutes before the time arranged for a public meeting last night, which was very largely attended. It was duly submitted to the meeting, and a resolution was unanimously carried as follows:—

‘That as the Chartered Company have made no satisfactory reply to the resolutions passed by the public of this province a month ago, requesting a definite statement of its intentions with reference to extending the Beira Railway, this meeting, representing all sections of the community, considers public opinion is being ignored by the Government and is resolved to petition Her Majesty the Queen upon the subject of its grievance and hereby authorises the Railway Extension Committee to draw up and to have signed and forwarded such petition through the proper channels.’

[...]
Wassau (Gold Coast) Mining Company, Limited, to Colonial Office (19 August 1897); held at the National Archives, CO 879/49/2, No. 185a.

18359. No. 185a

WASSAU (GOLD COAST) MINING COMPANY, LIMITED, to COLONIAL OFFICE.

(Received August 20, 1897.)

[Answered by No. 191a.]

The Wassau (Gold Coast) Mining Company, Limited,
147, Cannon Street, London, E.C.,
August 19, 1897.

SIR

I am instructed to inform you that a resolution, as under, was passed at a meeting of shareholders of this Company, held on the 12th instant:—

‘That this meeting strongly urges on the Government the importance of constructing the railway to the mines with as little delay as possible, in accordance with their promise.’

My Directors have also asked me to give you the following as reasons which make it of the utmost importance for this line to be constructed if the mining district which this Company has now proved to be of such wealth is to be opened up, their reef in Wassau being of the same character as that of the Witwatersrand, and so far as is at present ascertained, likely to exceed it in richness.

In my letter of the 3rd May last,* I pointed out that there is little hope for the mining industry without railway facilities being provided. At the present time transport by the River Ankobra is most uncertain, and owing to the frequent want of water in this river, and the absence of roads, it has frequently taken a year to get our machinery up to the mine. It is found that the Natives are unwilling to transport heavy pieces of machinery, such work being undoubtedly much harder than the transport of ordinary goods.
Further, the Company finds that it has to go farther afield for fuel, and undoubtedly the opportunity of obtaining coal provided by the proposed railway will be of the greatest advantage.

Again, my Directors feel very strongly that with regard to health the railway is of the utmost importance. At the present time Europeans are apt to catch fever through the exposure they have to put up with in reaching the mines from the coast. Then again, when attacked with fever it is a vital necessity for them to get away quickly for a change.

At the present time the Company contemplated spending a considerable sum of money on fresh machinery for further development of their properties, but so great are the difficulties of transport they hesitate about doing so, and are particularly desirous, therefore, of knowing how soon the railway will be put in hand, and at what time there is a probability of its being completed.

I enclose a short report of the shareholders’ meeting above-mentioned, and shall await with pleasure to hear from you at your earliest convenience.

I have, &c.
C. S. BARNETT,
Secretary.

Enclosure in No. 185A.
(Short Report of Meeting.)

THE WASSAU (GOLD COAST) MINING COMPANY, LIMITED.

An extraordinary general meeting of the Wassau (Gold Coast) Mining Company, Limited, was held at the registered office of the Company, No. 147, Cannon Street, London, E.C., on Thursday, August 12th, 1897 [...] 

Mr. STRUBEN: [...] 
With regard to the railway, the surveyor sent out by the Government has returned, and is now preparing his report to submit to the Crown Agents.

Mr. E. H. BAYLDON suggested that in order to strengthen the hands of the Directors a resolution should be passed urging the Government to expedite the construction of the railway to the mines

The following resolution was then carried: ‘That this meeting strongly urges on the Government the importance of constructing the railway to the mines with as little delay as possible, in accordance with their promise.’

Mr. STRUBEN: If the Government do not soon complete the railway, I think it will be advisable to get a traction engine.

[...]
14th August, 1897.

PROSPECTIVE RAILWAY DEVELOPMENT IN BRITISH EQUATORIAL AFRICA

By C. Steuart Betton.

From the Mediterranean Sea, southward through Egypt and the Sudan, a regular service of railways and steamboats is now available for some 2,470 miles inland* to Gondokoro, the northern frontier post of the Uganda Protectorate; whilst 735 odd miles by the Uganda Railway and steamboats on the Victoria Nyanza, brings Entebbe, the administrative capital of Uganda, within a four days journey from the Indian Ocean.

Now Entebbe, 55 miles due east of Gondokoro, is 275 miles in a direct line S.S.E. by S. of it, and a project to connect this comparatively inconsiderable distance between the two places need no longer be considered chimerical.

A recently constructed cart road leads from Entebbe, via Kampala and Hoima, to Butiaba, a Government post on the Albert Nyanza, and from thence it is possible to descend the Nile (Bahr el Jebel) by boat, as far as Nimule, a post a few miles north of the junction of the Unyama with the former river.

The one steel boat at present on the lake is quite in adequate for existing requirements, and a light-draught steamer might at once be advantageously employed, as it will be needed for future development of lake commerce.

* Alexandria – Luxor, 547 miles, 4 ft. 8 1/2 in. gauge; Luxor – Shellal, 141 miles, 3 ft. 6 in. gauge (Egyptian Railways). Shellal – Tewfikiah (Wady Halfa), 125 miles, Cook’s or Sudan Government Steamboats; Wady Halfa – Khartum, 576 miles, 3 ft. 6 in. gauge, Sudan Military Railway; Khartum – Gondokoro, 1,081 miles, Sudan Government Steamboats and Gunboats.
Beyond Nimule, further progress by water is barred by a series of rapids, which extend for over 100 miles to Rejaf, and the sole available means of transport is by porters.*

Between the Belgian stations of Rejaf, Lado, Kero (or Kiru), on the west bank of the Nile, a small paddle steamboat, the *Van Kerckhoven*, plies; but at present there is no object in the Sudan Government steamers proceeding further south than Gondokoro, on the east bank,† which is the last place touched at. Moreover, the short distance, some eight miles, that might be saved at all seasons by water-carriage south of Gondokoro need not here be considered, as a more suitable site for a station in British territory is not likely to be found in that distance.

Sir Harry Johnstone, in his report on Uganda, [Africa No. 7 (1901), page 19] suggests that a good cart road be constructed from Dufi to Gondokoro, ultimately to be followed by a light railway.

Apparently Dufi is a lapsus calami for Nimule, as the former was a station of Emin Pasha’s on the west bank of the Nile, and is now abandoned, and furthermore, it is in Belgian territory.

It may be doubted whether, even if the cart road were constructed, transport animals would succeed in this climate. At an elevation of only 1,500 feet above sea level, in the Nile Valley the heat is intense, and the few horses and donkeys that have been introduced apparently lived but a short time.

Previous experience of the appalling mortality of transport animals, in some what similar country in British East Africa (where the deaths caused by tsetse fly formed but a small proportion of those from various kinds of cattle diseases), warrant one in assuming that such mode of transport could be but a costly and temporary makeshift. The Bari natives possess some cattle, but these are remarkably small, and unsuited to draught purposes.

The question then arises as to the possibility of a railway to connect up the 100-mile link in the chain of communications to Gondokoro.

* Porters are rarely available either at Nimule or Gondokoro, and a traveller reaching either place is likely to find himself stranded, until negotiations (through the administrative officer at the stations) can be concluded with the Bari chiefs for a supply of carriers from village to village. The incessant delays, endless ‘shauri’ (palavers), and general discomfort resulting, can be but faintly imagined by those unacquainted with the Nilotic tribes. It is preferable to engage Baganda porters at Kampala, and to march the entire distance between that place and Gondokoro. Travellers by the reverse route would have to advise their arrival two or three months beforehand, and arrange for carriers to be ready to meet them at the latter place.

† The ‘post-boat’ stern-wheeler *Amkeh* monthly plies between Khartum and Kanisa (6° 46’ North Lat.), a post for the sudd-cutting party; and thence a light draught gunboat carries the mails to Gondokoro. The accommodation on either boat is limited, but suffices for present needs.
From Nimule the present caravan track skirts the east bank of the Nile, crossing the formidable Assua River,* and, for 40 miles nearly to Mugi, porterage by native carriers, / even of the lightest loads, is extremely difficult. † The river (Nile) here runs through a deep one-sided gorge, said to be 135 feet in the narrowest part, where a high mountain range, rising 2,000 feet above it, comes close down to the west bank; forming a barrier of escarped hills of Gneiss and Mica Schist, which gradually diminish, and finally break out into cones as they recede to the north-west.

On the east side, very broken ground is encountered, and a range of hills, 1,000 feet or more above the river, is noticeable; but, unfortunately, I had no opportunity of ascertaining how far inland this extends.

Apparently this range forms the water parting between the Nile and River Gomoro (or Khor kit). This latter river runs north-west, and after 50 miles enters the Nile opposite Rejaf, being there 500 yards across, between low banks, with a sandy bed of decomposed granite, partly covered with water a few inches deep, and liable to heavy floods.

Beyond Mugi the country may be described as undulating, in places covered with bush jungle or grass, with patches of fine timber, and dotted with low ranges of hog-backed hills and granite outcrops, presenting, however, few engineering difficulties.

But it is certain that in the neighbourhood of Nimule heavy work will be unavoidable; for, in a radius of 10 miles, the Assua, and its large tributary, the Atappi, the Unyama, and the Jeifi rivers (vide p. 13) discharge enormous floods (after heavy rains) into the >-shaped elbow of the Bahr el Jebel at this point, and much broken ground may be reckoned on.

Assuming that a reconnaissance of the country between Nimule and Gondokoro will prove that a line is practicable (i.e., the cost be not excessive), it is obvious that railway plant and material, for however light a line, could not be brought up through the Sudan. ‡ Furthermore, neither labour nor food is obtainable in the portion of the Bari country under consideration. The natives, fairly

* After its main tributary, the Atappi, has joined it, and 1/2-mile above its junction with the Nile, it is 60 feet wide, a series of deep pools with ridges of granite rock running across it, strata uptilted nearly vertical. In flood said to be 80 feet wide, 14 feet deep, with swift current; liable to very sudden flushes, High ground on either bank.
† The track apparently has been unimproved since the Bari fishermen first utilized the Hippopotamus, and other game paths to convey their catches of fish to neighbouring villages. For a caravan route to an European settlement it is execrable.
‡ Even after the completion of the Suakim-Berber line, the distance from the Red Sea would entail transport of 470 miles by railway and 1,081 by boat. The exigencies of the Sudan, for many years to come, will require expenditure on improvements of its waterways rather than on construction of railways south of Khartuni.
numerous, are none too friendly, and generally have been on the verge of starvation during recent years.

Considered by itself, the idea of a short detached piece of line here is not practical. Should, however, the light line westward from Entebbe, as suggested by Sir Harry Johnstone, to open up the Ruwenzori district, be considered, we may examine the possibility of branching off from the latter at some convenient point, and, striking northward, of crossing the Somerset Nile near Fajoa, of continuing east of the Bahr el Jebel toward Nimule, and ultimately to Gondokoro.

Such a line might be feasible. The gauge of the railway need not be considered here, but, looking forward to possible distant-future developments, it may be questioned whether a 3 ft. 6 in. gauge would not be advisable at the onset.

As regards the engineering difficulties likely to be encountered, it may first be observed that the Victoria Nyanza is 3,775 feet above sea level, the Albert Nyanza 2,170 feet, and the Nile at Gondokoro approximately 1,550 feet. Heavy gradients, therefore, are not to be expected.

It is noticeable that, as one leaves the Victoria Nyanza for the Somerset Nile the valleys widen out, and the hills of red marl, shale, or metamorphic rock lessen, till, with a few exceptions, they gradually disappear and the country presents the appearance of a huge plain gently sloping to the north and intersected by wide swamps and numerous small streams. Long waterless tracts are nowhere met with.

Generally speaking, it would be an easy country to survey but for the intensely long rank grass which covers much of it. In the dry season this grass is red and an extended view then only is obtained.

Through Uganda and Unyoro most of the swamps are choked up with rushes, papyrus,5 and grass, and it is only occasionally that a current is noticeable. The time of year (October) at which I traversed the country is generally considered to be the middle of the second period of maximum rainfall, but in no case did it appear that any of the swamps would present much difficulty, and the treacherous and bottomless quagmires, mentioned by some travellers as occurring in Uganda, were not encountered by this route.

The native roadbuilders’ attempts at bridging these swamps consist of carrying across a foot or 18-inch bank, leaving a small opening at the lowest part of the valley, where a few / logs are thrown transversely to the road, and then covered with brushwood and earth. So long as these are kept in repair they admirably effect their purpose; but, except near the capital, these roads are often in a rotten condition.

I can recall no instance where a 5-feet bank would not have been amply sufficient for any contingency; and, as regards the opening, 10-feet girders on screw-piles, with the toe of the bank protected by rubble stone, would probably
be found better than culverts; for the difficulty of excavating foundations, during most months of the year, would be considerable.

Presupposing the railway to be started in the vicinity of Entebbe (which is situated on the south end of a peninsula that is practically an island), it is possible that a suitable harbour may be found on the western side of the Murchison Bay. Kampala is six miles due north of this bay, and the native road thither, as is customary in Uganda, runs straight over the low-lying hills, all of which might easily have been avoided by slight détours.

Striking north-west of Kampala, and following the native road which leads through Kunguni, Kalasa, and Kisibika, over low undulating country, a range of low hills (through which the River Maanja runs) is conspicuous on the south-west. Many of the valleys passed are swampy, in which cases corduroy bridges are employed.

At Kisibika an extended view is first obtainable, and one is surprised at the general aspect of the country, which is strongly suggestive of the Taru Desert (East Africa) at certain seasons.

Crossing the Maanja River where it is flowing swiftly, 20 feet wide and 6 inches deep (Nov., 1901), a mile of marsh land is met with. The track then keeps about 10 miles west of the latter river, and, except for a few swamps, no obstacle is met with up to the Kafu River, in Unyoro; crossed at a point due south of Masindi. The papyrus choked stream, 15 feet wide, has no perceptible flow, and for miles to the north of it there is low lying ground.

However, this river would probably be crossed near the abandoned station of Fort Lugard, and, by following the water parting between the Kafu River and the Albert Nyanza, the granitic hill country round Massindi would also be avoided. With the exception of the major bridges required for the Maanja and Kafu Rivers, the country traversed strikes one as being extremely easy for road or railway projects.

It is probable that the Kesokwa, Waja, and other rivers flowing into the Albert Nyanza would require major bridges; but the Waja only I crossed north of Masindi, where its branches were 5, 30, and 6 feet wide, at intervals of two miles apart, where it has a rapid fall, is evidently subject to heavy floods, and the main stream is between high banks.

On nearing Fajao the caravan track leads over very broken ground, and, a mile from the river, follows a spur, with deep ravines on either side, leading sharply to the Somerset Nile. The former European post, consisting of a few grass huts, is perched on an isolated rock hill, which commands the ferry.

Westward of Fajao the hills rapidly widen out and disappear, and a broad expanse of low lying ground borders the river, which is a mile in width, gradually increasing to five miles or more as it nears the lake. On the east side of the station
several more isolated rock masses are conspicuous, and three-quarters of a mile further are the Murchison Falls.

It is evident that the river has cut its way back, leaving these masses of gneiss as ‘witnesses.’ The cliffs, 200–300 feet high, are composed of rocks belonging to the Archæan series, and the specimens I brought home have been identified by Mr. George Prior, of the Natural History Section of the British Museum, as biotite gneiss, mica schist quartz, and garnetiferous mica schist.

At the site of the falls, which are probably over 100 feet in height (reputed 120 feet), the river, 1/4 mile wide, after several rapids, takes a sharp bend to the north-west, and then again west, and, rapidly narrowing, tumbles over a rock ridge 10 feet high, then over another 5 feet ridge, and finally enters a cleft through one side of a mica-schist-rock witness, similar to those previously mentioned.

The sides of the cleft, which varies in width from 20 to 30 feet (on meeting Major Delmé Radcliffe two days later he informed me the minimum width measured by him was only 18 feet), are absolutely sheer. Down this shoot the river rushes, an unbroken mass, for 150 feet, apparently then meets with some obstacle, probably a harder class of rock, through which it is endeavouring to force its way, and, hitting this with tremendous force, a ‘back wave’ is created. Meanwhile, ere this can break, the mass of water following on has forced its way over the obstruction with considerable turmoil, and often in a mass of spray.

Another 250 feet is traversed through the / continuous cleft ere the water tumbles into a huge basin below, followed hard after by the back wave, thus causing the peculiar irregular sound of the falls so noticeable even at Fajao.

On the south side the ledge above the cleft is of considerable extent and evidently marks the site of the river bed in former times. Hollowed out in the ledge are some large ‘pot-holes,’ one of which is 15 feet in diameter and 10 feet deep (another 6 feet in diameter) now filled with clear water. Behind this ledge (quarter mile wide including both sides of the cleft) the hills rise in tiers, but lack of time alone prevented a further examination of the river, more than half mile above the falls.

This spot, however, struck me as admirably adapted for a crossing, and the American type of trestle viaducts would be especially adaptable. Probably trestles of 100 feet height would be sufficient at the actual crossing, but as I was unable to examine the north side of the river at this point I know nothing as to the possibilities of the approach there.

Apparently there exists a plateau extending some distance northward, along which the line would run, avoiding the branches of the Tengi River, and crossing the Achwa near its sources. The latter river, a few miles ere it enters the Bahr el Jebel, was 50 feet wide and waist deep, between banks a few feet high.

From the Somerset Nile onwards the aspect of the country rapidly changes. We are crossing the Eastern watershed of the Bahr el Jebel, and usually are within
ten miles of it. The drainage runs from east to west – wide swamps are rarer, streams and rivulets more common. Long rolling downs of grass (still dense rank grass as before encountered, and often six to twelve feet high, but the natives are now, in November, already firing it)* are succeeded by patches of bush jungle. Probably the entire country was so covered; then, destroyed by fires, the bush jungle was replaced by cultivation; intertribal wars, &c., followed by famines, have reduced the numbers of natives, and huge areas of once cultivated land are now the haunts of antelope and other game.

The heat is much greater, but not so depressing, for the atmosphere is intensely dry. The natives also have changed. From the well-clothed natives of the ancient Kitara kingdom, we pass to the stark-naked Nilotic races: Acholi (closely resembling and probably allied to the Kavirondo), Lur, Madi, and, finally, Bari; amongst all of whom, the bastard form of Arabic spoken by the Nubians (i.e., the Sudanese) takes the place of Kiswahili, the lingua franca of East Africa.

No river of any importance (for the two crossed by the caravan track north of Wadelai,† would be probably avoided by the railway, and others crossed are only 2 to 4 feet wide), need not be mentioned, till the Zukar River is reached; 30 feet wide, 3 feet deep, it flows swiftly between low banks to the North-West, passing close to a bank of magnificent primæval timber.

A few miles north of the Zukar, the track crosses the water parting between the Bahr el Jebel and the River Jeifi, and distant views of wide rolling plains are obtained. The track crosses another river (? Dirikwa), three channels three to four feet wide and three feet deep, between banks 15 feet high, and then keeps along the west side of the watershed of the River Jeifi, crossed where it is 30 feet wide, 2 feet deep, with a branch 6 feet wide and 2 feet deep, between low banks.

Ten miles further the River Unyama is met, 30 feet wide, 2 feet deep, also with low banks, after the abandoned station of Affuddu is passed. The track then turns sharply north-west, and on a granite hill overlooking the Nile, and commanded by hog-backed hills on the east, the existing Government station of

* Apparently a road cleared 10 feet wide is, in less than a year, entirely overgrown except for the 10-inch track hardly kept open by passing traffic. This track is often completely obscured, especially after heavy rain, by the overhanging grass; and after a few miles march in the early morn, ere the dew has been dispersed, the entire caravan is wet through to the skin. The difficulty of constructing the road originally is so considerable (the only implement used by natives for grass clearing being a pointed heart-shaped hoe with a short handle – Uganda pattern), that it seems remarkable some European machinery has not been attempted. A light reaping machine, drawn by a couple of oxen or mules, to cut 5 feet swathes, would keep open the main roads throughout the country, and reduce the difficulties of transport, which are always sufficiently onerous during the greater portion of he year.

† The present station of Wadelai is on the east bank of the Bahr el Jebel, close to its junction with the River Omee. The original station of Emin Pasha’s was on the west bank.
Nimule is reached. The feasibility of a railway beyond this point to Gondokoro, has already been discussed.

In conclusion, it may be expected that the line will be one of easy curves (except possibly part of the last section) and gradients; water supply everywhere ample, and fuel, except in a few localities, generally plentiful.

It having been previously mentioned that the suggested railway could not be built from the Gondokoro end, there remains the question of its construction from Entebbe.

Now, the first portion of the line would pass through the densely populated part of Uganda proper, where a large supply of cheap labour can be obtained locally.

The hut-tax, introduced two years ago, of Rs. 3 per annum, is payable in coin, kind, or by one month’s labour on Government work. The Baganda largely avail themselves of the latter method, and as they provide their own food, public works are being cheaply constructed.

Allowing that, on starting the railway, increased demand for labour will tend to raise prices, and that food will have to be provided for the workmen when beyond the confines of their own districts, it will still be evident that, in comparison with the imported labour necessarily employed on the Uganda Railway, the cost would be slight: probably only one-quarter of the latter.

The present Government rate in Uganda may be taken as the minimum for unskilled labour; but, as an example of extremely low wage, I may instance when an Indian merchant at Kampala agreed to supply me with 33 porters for the six weeks journey to Gondokoro at Rs. 11 per capitum. (This included cost of registration, beads of various kinds for food barter en route, and commission. The porters, on their return, would be free to carry loads for the contractor, who would thus make a handsome profit. The actual wage for which the porters hired themselves out to the contractor was Rs. 4 for the three months – or 1s. 8d. per mensem; yet large numbers of porters are being hired at this small wage.)

It must be borne in mind that the administrative officers in the various districts, are already, through the native chiefs, directing the construction of roads, &c. All that would further be required would be the formation of a central labour bureau, under some officers well known to both Baganda and Banyoro,

\* e.g. on the East coast, where labour of any kind has always been scarce and high prices for even unskilled labour prevailed. Increased demand of recent years has forced up prices to absurd rates, which are (or were in 1901) still maintained. A repetition of this, in Uganda, it is to be hoped, will be carefully avoided.

\+ Punjabi coolies, on three year agreements, had to be provided with Indian rations, also imported. Their passage to and fro, housing, and incidental expenses which would not be incurred with Baganda labour, raised the cost of construction to a very high figure.
who would deal solely with the chiefs. His picked staff would deal with the
organisation, on which everything would depend.

Commencing with a few hundreds of labourers, it would be necessary as the
work proceeded, to insure continual drafts being forwarded to maintain the ultimate standard, say 10,000, required. The question of food supply would also fall
on this bureau; entailing high organisation and a complete mastery of detail;
and the strain on the Uganda administration would undoubtedly be great.

The difficulty of providing food beyond the confines of Uganda and Unyoro
would also be very considerable.

One important point may be noted – the labourers would be, advisedly,
working directly under their chiefs, in their own country or in adjoining ter-
ritories, with the natives of whom they are on friendly terms. Constant friction
between imported foreign labour and natives would be altogether avoided, and
a police force, except for the purpose of guarding stores, &c., unnecessary.

Moreover, the contact of the comparatively civilised and intelligent Baganda
with the savages of the Upper Nile Province (Acholi, Lur, Madi, Bari) would
have a far-reaching beneficial effect. Trading caravans of Baganda and Banyoro
are already constantly proceeding to and fro between Entebbe and Gondokoro,
and it is by no means uncommon to meet en route isolated unarmed parties of
two or three men. Not only would there be no disturbance (among the Bari
especially the advent of earthwork parties would be beneficial), but these latter
would soon join in the construction of the earthworks. They are keen traders,
but at present their chief desire is for brass, &c., wire, and beads, and such like
commodities. Large numbers at first might be attracted by the prospect of food
alone; for, generally speaking, from the Somerset Nile onwards, the tribes have
usually been famine-stricken during recent years. (It is, however, probable that as
the country becomes more settled, and a cycle of ‘wet’ succeeds one of ‘dry’ years,
there will be ample food for passing caravans; but no more can be expected.)

Another point in the employment of natives of this portion of the country
is that the difficulties of housing (also transport) are reduced to a minimum.
Even when on the march, they daily construct grass huts, at which work they are
adepts; and when a lengthened stay in one place is intended, wattle houses, with
rain-proof thatch, are quickly constructed.

In the case of the Baganda, personal belongings, on a three months’ trip, are
reduced to a change of bark-cloth clothing (mbugu) and a cooking-pot. Nor do
they possess much more when at home.

It is unfortunate that the natives of (former) Kitara have in recent years been
decimated by wars, famines, and disease (at this moment ‘sleeping sickness’ is rampant),
and that from various causes the birth-rate is decreasing. The peas-
antry (bakopi) of Uganda is undoubtedly the finest material we possess in British
East Equatorial Africa for the future development of the country.
The questions of the advantage of the railway, its cost, probable commerce, &c., have not been touched on. They are beyond the purport of the present paper, which is to comment on the feasibility, from a railway engineer’s point of view, of a line through that portion of the country (440 miles) traversed in a five weeks’ march between Entebbe and the Sudan frontier, in October and November last.

[Unless otherwise stated, by the ‘width’ of rivers is implied the width of the water or flooded area at the point at which the caravan track crossed it. Naturally, the fords selected by the natives are usually at points where the river is broad and shallow, and the banks low. Notes of every stream, river, and swamp were taken for the information of later travellers by this route, but further examination of most rivers was impossible in the limited time available on the daily march.

[...]
Informal Conference with Mr. F. Bedford Glasier, on the Subject of the Lagos Railway, held at the Exchange Station Hotel, on Monday, April 27th, 1903, African Trade Section of the Incorporated Chamber of Commerce (Liverpool: C. Tinling & Co. printers, 1903).

AFRICAN TRADE SECTION

OF THE

INCORPORATED CHAMBER of COMMERCE of LIVERPOOL.

INFORMAL CONFERENCE

WITH

Mr. F. BEDFORD GLASIER

(GENERAL MANAGER, LAGOS RAILWAY),

ON THE SUBJECT OF

THE LAGOS RAILWAY,

HELD AT THE

Exchange Station Hotel, on Monday, April 27th, 1903.

LIVERPOOL:

[...]

– 223 –
Sir Alfred Jones, K.C.M.G. Gentlemen – I take it that you do not want to waste time, and that you would like to hear what our friend, Mr. F. Bedford Glasier, has to say about the Lagos Railway. First of all, I must say that this meeting is purely an informal one, as our friend is a Government officer appointed by Mr. Chamberlain to look after the Lagos Railway. Liverpool has been the pioneer in the movement for railways in West Africa, and we can safely say that we induced the Government to construct the railways. I don’t think we are sorry for what has been done – they might have been made cheaper, but this is generally the cry after one has made a bargain. For developing the country, the thing is to get railways as cheap as you can, and as quick as you can – the quicker the better. The French are showing us a great example in the matter of constructing railways. They say the French are going in for railways on a tremendous big scale. We dare not be left behind, and at the present time there does not appear to be any doubt as to who will reach the Niger first by rail. We have gentlemen here from Manchester, and I have no doubt they see the desirability of extending the railway to Jebba. I am also very glad to see Mr. Ellis Edwards present to-day, as he has always taken a great interest in inducing the Government to construct railways in West Africa, and, as a result of Liverpool’s work, we have now got railways in West Africa, at the principal ports, running up-country for about 100 to 150 miles. To show what a convenience the railway is – my company took out a party to Sekondi for the Ashantee Goldfields, and after landing they were at their destination within twenty-four hours, whereas on their first trip, before the construction of the railway, it took them nearly one year. Besides, you can travel by the railways with health and comfort. There is no country in the world where railways will be of more value than in West Africa, and there is no more valuable country, as we are learning every day. Our last boat arrived and landed £21,000 specie from the Gold Mines. The railway is a necessity, and it is also a great means to civilisation. It is a poor thing, as my friend Mr. Irvine knows, to send a missionary empty-handed into Africa. We are going ahead now, and it is a great kindness of Mr. Glasier to come here and give us information about the Lagos Railway; he is not a man appointed by Contractors, but a Government officer, and salary-paid official. To people who are paid a salary, it is more to their credit to make the railway for the smallest cost, and to get everything for the lowest possible price. I am perfectly certain that the railways in / West Africa will pay cent. per cent. when
in proper working order. With regard to railways, we want the railways at once. Mr. Glasier is purely a man representing the Colonial Office, and I am perfectly certain, when we have heard his statement, we will be glad to help him to extend the line at Lagos. I think it is only a question of time before we have thousands of miles of railways, and you will then have a great deal of your labour released. What we want at present is railways about 150 miles long from every shipping port in West Africa, in order to develop the country. Now, Mr. Glasier, I am exceedingly glad to see you here to-day, and congratulate you upon the success of your railway. We would certainly like to have the railways made cheaper, but rather at the present price than not at all. I now ask Mr. Glasier to state his arguments in favour of the extension of the railway, and to press upon all present the extreme necessity of these proceedings being quite private.

I have much pleasure in proposing the health of Mr. F. Bedford Glasier.

Mr. F. Bedford Glasier: Sir Alfred Jones and Gentlemen – I thank you for the kind way in which my health has been proposed and received, and also for the honour you have accorded me in inviting me to meet you here to-day. Sir Alfred Jones has mentioned that this meeting must necessarily be private, and in accepting your invitation I made it quite clear that this must be so. I am here to-day in a private capacity, and cannot, therefore, speak for the Government of Lagos, or any body or persons connected with the construction or administration of West African Railways. Of course, as General Manager of the Lagos Railway, I am much interested in its ultimate success, and I am indeed glad to meet here to-day so many gentlemen, not only interested in the Lagos Railway, but in other undertakings, such as the Sierra Leone and Gold Coast Railways, for I have been for the last six years employed on the railways of British West Africa. I have for a long time felt that some misconception is prevalent concerning the construction and administration of West African Railways, and if I can give you any information which will elucidate any points which are obscure, or have been misinterpreted, I shall only be too glad to do so, and my visit to Liverpool will have served a useful purpose. I have gentlemen before me of great experience on the West Coast, who know the difficulties that have to be overcome, and the climatic conditions which render it impossible for Europeans to reside there for a long period without change; this is very detrimental to the desired continuity of administration, and is much felt in the construction and the inception of the working of railways, but when the systems are in full working order it will be less appreciable.

Up to the present we have not had time to educate the natives in railway matters; the native, as you know, is not fond of work – far from it, he resents work. I am speaking now of the educated native, and he is not blessed with those qualities of smartness, punctuality, and business aptitude which railway working requires. However, we are making some progress, and have reason to hope that in time some of them will become satisfactory native railway servants.
Sir Alfred Jones has alluded to the cost of West African Railways. The expenditure on the Lagos Railway will be under £7,000 a mile. I have been concerned with the construction of railways in three different continents, and am glad to be able to inform you that a comparison of the cost of the Lagos Railway with similar railways in other countries is favourable to the former. We hear a good deal about the alleged cheapness of the French West African Railways, but I am extremely sceptical that they have cost less than our own. I must remind you, gentlemen, that you cannot compare the initial cost of railways constructed by indirect compulsion and by granting land and monopolies with the British undertakings; time can only prove the actual cost of the former.

The working of the Lagos Railway has at times been adversely criticised. I should like to point out that when the present line was opened for traffic it had been decided to extend the railway. A policy of low rate was, therefore, deliberately adopted, which it was known would not pay much more than working expenses, but which would become remunerative when the railway was extended, and the length of haul thereby increased; for the present the Government was satisfied that the indirect benefits accruing to the Colony would fully compensate for the developmental rates. Gentlemen, the Lagos Railway has achieved its present purpose, the trade of the Colony and the General Revenue has greatly increased. During the six months ending September, 1902, the increased value of palm kernels and oil exported, compared with the similar period of 1901 amounted to over a quarter of a million; the railway has paid working expenses, and this year there will be a surplus of some £6,000. You cannot make a short line of railway dependent on forest products pay full interest charges unless heavy rates are imposed, as is the case on the Congo Railway, where, for instance, the rate for palm kernels is £4 per ton; such policy will make the railway a paying concern, but will not develop the Colony. As regards the extension of the Lagos Railway, as I have explained, I am interested in its ultimate success, and my view is to extend it immediately, for until it has reached its natural objective it cannot be fully remunerative. In regard to the administration of the construction works, I understand that it is generally believed in Liverpool that the consulting engineers are paid a commission on the amount expended on the construction; this is not so – Messrs. Shelford & Son receive a fixed salary.

Mr. Morel in his very interesting notes has clearly demonstrated the necessity of our reaching the Niger before the Dahomey Railway, and some of you, gentlemen, may have read two interesting articles which appeared in the Morning Post of last week. The French have deliberately adopted an extensive railway policy, and are carrying it into effect with expedition. A loan of 2 1/2 million pounds sterling, which is only a forerunner of more to come, chiefly for railway purposes and harbour works, has lately been placed on the market, and the interest guaranteed by the French Government. This is of serious concern to British
West Africa, the guaranteeing of interest by the Home Government, and unless, gentlemen, we counteract the French Policy, which menaces our present trade and future prospects, by vigorous enterprise, our trade in West Africa will be irretrievably damaged. Gentlemen, I must now crave your indulgence; as a Railway Manager and Civil Engineer my life’s work lies rather in deeds than words, and the present occasion is strange to me. I can only add that if I can, in return for your kindness, give any information in my power it will be a pleasure to do so. I beg again to thank Sir Alfred Jones, Mr. Holt, and other members from whom I have received hospitality during my visit to Liverpool.

Sir Alfred Jones: I shall be glad to hear a free discussion of the railway. There can be no question that if British trade is to be pushed we must not lose any time in Liverpool. If the Government cannot do it, then we must get to work in the same manner and on the same lines as the Canadian Pacific Railway was constructed. If the English people had any kind of sense of responsibility for the future we should not have had the French in Africa at all, and no nation was ever less entitled to get the Cameroons than the Germans, but it was all owing to British apathy. We have a great deal to undo; the world has changed with regard to Colonies; we must be up and doing. The object of this discussion is to get information from Mr. Glasier re the Lagos Railway. We were glad to hear that he was a Government man and not a contractor’s, and we were certainly under the impression that Messrs. Shelford were paid a commission, but are glad to hear that they receive a salary. I should like to see the line made quickly rather than let the French get to the Niger first. We also want the railway from Old Calabar to Lake Tchad. I will now ask Mr. Holt if he has anything to say on this subject. He would like to have the railways built cheaper. It is the greatest work you can do for the native of West Africa to construct the railway, and also for the Lancashire spinner, and it is also important to have cheap rates of freight – you have got them by the steamers.

Mr. John Holt: I regret I was unable to be present to hear all of Mr. Glasier’s remarks. It rather amused me to hear Sir Alfred allude to me as being economic, but I sometimes think that I spend a great deal of money. I see that Mr. Glasier has now raised the rates on the Lagos Railway, which I think would not have been necessary if the railway had been cheaper. I maintain that if the railway cost £10,000 per mile to build, and it could be done for half the cost, the railway would go twice as far for the same money. We all agree that we want railways on the West Coast, and we advocated the same many years ago, and we want as many as possible. If there is one place in West Africa where a railway ought to pay it is in Lagos. Personally, I feel disappointed that up to the present time they have not been able to produce a dividend, and that they have not got anything to pay the interest on the capital the Government lent them. If they cannot do this, then there must be something wrong in the working of the railway, and
when such is the case, some of us here have an idea that there has been too much money spent on them. However, Mr. Glasier assures me that the railway has been an economical one, and, as he is an expert, I cannot attempt to go against his opinion, but I must say that the reports we hear of other railways being built at cheap rates must be very misleading. In Dahomey the French Government are making the railway, and the contractors only find the railway material and engines, and I hear that the French Government are going to make the railway for half the amount it cost to build the Lagos Railway. The contractors appear to have the privilege of taking so much land each side of the railway as a recompense for their work. I should like our Government to go into the thing in a business-like manner – I want them to put out tenders for the material, including the freight. We should go to our friend Sir Alfred Jones to get cheap railway material. I think there can be very little harm in urging the Government to work as business men, and I therefore say let us urge the Government to go on with the railways, and ask them to consider whether it would not be advisable to ask for tenders, and compare the estimates with what the Government expects it to cost. With regard to the cash question, Sir William MacGregor, in his very able message to the Legislative Council (it is a pattern for the other Colonies), has asked whether the Government would be disposed to stop a proportion of the sinking fund for some years in order to have sufficient funds to go on with the railway, but I do not know how the Treasury will view a matter of this sort. There must be a sinking fund to give them more security, and I fancy that there will be some difficulty on this point, and I don’t think Lagos will be able to provide the necessary funds for the extension of the railway, if carried on with care and economy. In the arguments brought before me with regard to the proposed extension of the railway, there is a mention of the expansion of the trade in Lagos for one year, but we must not judge by the results of one year. The last year has been a good one for produce in Lagos and Dahomey, also in the Cameroons and elsewhere, so we cannot give credit to the railway for the expansion of trade. You will notice that the principal increase has been palm kernels, but, on comparing the figures with those of Dahomey, you will see that there has been a similar increase in Dahomey without the assistance of any railway. Mr. Glasier can only calculate and take credit for a little over 10 per cent, of the kernels brought down.

I must say that I don’t share the feeling of the Chairman and others with regard to the French railways reaching the Niger first, as I don’t think it will have an important feeling upon the trade. I don’t mind which railway reaches the Niger first, but I am rather inclined to back the French, as they have managed their business first-class. I should be very glad if Mr. Chamberlain could see his way to extend the railway, even to Kano, and we may find practical results of the employment of any capital necessary in the railway undertaking. I can only urge the Government to make the extension on sound business lines, and to get
the best value for their money. If you could get the Government to guarantee the
shares, it would place the matter on sound lines.

Sir Alfred Jones: I think it is much to our credit if we allow the native to
keep his land, and make the railway through it, which the French do not appear
to do. I also think it is a great point that we should reach the Niger before the
French. The following are the costs of some of the principal railways, viz.:–

<table>
<thead>
<tr>
<th>Location</th>
<th>Cost (£ per mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sierra Leone</td>
<td>£ 4,000</td>
</tr>
<tr>
<td>Gold Coast</td>
<td>£ 7,000</td>
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<tr>
<td>Lagos</td>
<td>£ 6,750</td>
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<tr>
<td>Uganda</td>
<td>£ 9,500</td>
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<tr>
<td>Cape Railway</td>
<td>£ 10,000 under contract.</td>
</tr>
<tr>
<td>Tasmania</td>
<td>£ 8,000</td>
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<tr>
<td>Queensland</td>
<td>£ 6,000</td>
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<tr>
<td>New Zealand</td>
<td>£ 7,000</td>
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I should be quite willing to press the making of the railway on the Canadian
Pacific system, or on the same lines as the French, but I don't think the latter
system would be quite fair to the natives. If you can make this railway in a bet-
ter way and cheaper, it is our duty to ourselves and also to the interests of the
Colony. I look forward to having thousands of miles of railway within the next
ten years. We cannot expect the new railway to pay all at once. I am working
up the West Indies, but do not expect to make money at once. When you hear
of 30,000 people per week coming down with produce, I think the railway is
bound to pay if low rates are started. I would like to hear Mr. Bradley’s opinion
on the matter, as he is very often in Lagos.

Mr. J. Bradley: When I was last in Lagos I went up to the terminus of the
railway at Ibadan, and spoke to several of the principal natives on the subject of
sending their produce / by rail. The natives ask which is going to cost them more
– to send their produce by rail or by canoes; so it appears to me to be merely a
question of rates. I would strongly advocate pushing the railway on to reach the
Niger before the French, as if the French once take the trade, it would be very
hard work to get it back again.

Mr. Ellis Edwards: I am very pleased to see Mr. F. Bedford Glasier here
to-day, and I am certain that you cannot do anything in Africa without the
railways. It has been a great pleasure to listen to Mr. Holt to-day, and I think
Mr. Glasier has converted him. Mr. Holt generally says that railways won't pay
in West Africa. If you read carefully Mr. Glasier’s report on the railway, which
is a most interesting one, you will see that the revenue in six months has been
increased by £47,000, and this is entirely due to the railway. Without the railway
you can do nothing, and I have always persisted in this Mr. Glasier tells us that
the railway pays expenses, and indirectly it does pay expenses. If you had had the
railway on the Gold Coast years ago you would not have had a war which cost
millions, in fact, a railway is worth more than 100 mines. I think it is a great thing to have Mr. Holt converted – Sir Alfred Jones has always been for the making of railways, but Mr. Holt has always been against it.

Sir Alfred Jones: I don’t think Mr. Holt is against the building of railways, but he wants to make the railways cheaper. I hope Mr. Glasier does not think that we do not appreciate his work.

Mr. John Holt: I have never been against Sir Alfred’s opinion re making of railways, but we should spend other people’s money as if it were our own, and get the best value for it.

Mr. J. C. Atkins (Oldham): With reference to Northern Nigeria, everything points to the fact that good cotton can be grown there, but the difficulty is to get the cotton down to the port. If the British Cotton Growing Association is to be successful in its endeavours, we must have railways in West Africa, otherwise we cannot get the cotton.

Mr. E. D. Morel: I should like to know something about the contractor’s system, and if Mr. Glasier could tell us the disadvantages of the contractor’s system. We all want railways in West Africa, and the financial question is what the Colonial Office is considering. There is one point, however, that should not be overlooked, and that is that Lagos has a debt of £1,300,000, whereas Dahomey has not a single debt. I should like to know, however, if there is any objection to the Colonial Office making enquires about contractors.

Sir Alfred Jones: Conakry had two contractors to build the railway there. The first one failed in business, also the second, so the French Government had to take the matter in hand. Another thing, the French are exceedingly liberal in Imperial grants, which the English are not. We want the railway quickly, and the Government has a certain policy. The Colonial Office let the railway in Jamaica be constructed by contractors, with a very unsatisfactory result. Then as regards the water carriage competition, the railways must be extended in order to compete with this.

Mr. John Holt: In going to Oshogbo, what are we going to get from there that we are not getting at present. I think the Lagos Railway has cost something like £10,000 per mile.

Sir Alfred Jones: With regard to the three bridges mentioned in the report, Mr. Glasier pointed out to me that these bridges were built before the railway was constructed.

Mr. F. Bedford Glasier: The Carter and Denton Road Bridges are not part of the railway undertaking, but merely attached to the management for administrative purposes; their use is to connect the town of Lagos with the mainland, and this purpose they fully serve. The cost of their maintenance could be easily obtained by levying a small toll on / people and animals crossing – a much larger sum had to be paid for ferry charges before the bridges were built.
This is now being considered, but I believe that the Government at present are of the opinion that the general revenue of the Colony can well bear the cost of this up-keep. It would be absurd to include the expenditure on these bridges in the cost of the railway, one of them – the Denton Bridge – is actually a competitor, as it is an alternative route.

Mr. Morel has pointed out that Lagos has a large debt of £1,300,000, and Dahomey has nothing. That is quite correct, but Lagos has the railway and Dahomey has nothing – the railway there belongs to the contractor, who will doubtless work it for his own benefit.

With regard to the desirability, or otherwise, of constructing railways in West Africa at the present stage by contractors, I can speak from experience, as for six years I was employed, in positions of responsibility, by one of our largest firms of contractors. If you bring a contractor into West Africa you constitute a monopoly. English contractors will not fight for West Africa, they will not trespass on one another’s preserves, and if any contractor took the work it would only be with a very large contingency item, for the conditions of railway construction are so little known, and the disabilities occasioned by the climate so obvious. During the construction of the present three West African Railways a rebellion has occurred in each colony, greatly hindering operations. Consider if these railways had been built by contractors what a large sum, as compensation to the contractor, would have been awarded by any arbitrator. In West Africa, with its terrible climate, we cannot expect to build railways at less capital expenditure than in other countries more favoured by nature; Sir Alfred Jones has quoted the cost of similar railways in other countries, and the comparison is favourable to Lagos. I would mention that the Cape Government Railways, which are of a similar gauge to the Lagos Railway, but of much greater length, average a capital cost of £10,400 a mile. It has been alleged, gentlemen, that a contractor offered to build the Gold Coast Railway for £4,000 a mile. I have also heard that a firm wished to be allowed to construct the Uganda Railway for some £3,500 a mile, which finally cost more than £10,000 a mile. Now, gentlemen, you cannot waste hundreds of thousands of pounds in railway construction unless some extraordinary and untoward circumstances arise, which did not in this case, and, as the actual cost in comparison with the contractor’s estimate was so divergent, it may be presumed that the terms proposed by the latter were sufficiently elastic to cover the discrepancy. When West Africa is sufficiently developed to require competing railways it will be time to call in the contractor – till then your interests are better served in the construction of railways by a salaried staff.

As regards the operation of a short length of railway in a new country, you cannot with forest and agricultural products both meet the interest on capital outlay and develop the country; the latter requires cheap rates, and these only pay a railway that has a long length of haul. In India, it was many years before
the railways paid, but they developed the country and increased the general revenue; now that they have been extended, and reached their natural limits, they form the most valuable asset of that Empire. When the Lagos tariff was fixed, I told the Governor and others that the charges with the existing length of line would barely meet the cost of haulage, but the Government decided that the railways must be extended, and that if working expenses were met the indirect benefits would fully compensate the General Revenue for the interest paid on capital charges. The railway has more than paid its working expenses, and there will approximately be a surplus of some £6,000 for last year, and the excess of the General Revenue of the Colony over expenditure – for three years prior to the opening of the railway there was a deficit – culminated for the last financial year in the very satisfactory figure of over £80,000. /

In reply to a question, Mr. Glasier said that the quantity of palm kernels carried for the half-year ending June, 1902, amounted to 7,000 tons, with general merchandise 10,800 tons, earning £11,384.

In reply to a further question regarding the departmental system of building railways Mr. Glasier said, when it has been decided to construct a railway or other big undertaking, the Crown agents obtain the services of a consulting engineer to advise in all technical matters, and who closely supervises the work – for this he is paid a fixed salary and actual office expenses; he receives no other remuneration whatever. All the material is bought by the Crown agents, who invite tenders in the open market for all purchases exceeding £100. It is usual in young and undeveloped colonies to build railways departmentally. It is not considered desirable to place the work in the hands of a contractor, who is only concerned with his immediate profit and who is not interested in its stability or its ultimate success. To safeguard the work being adequately performed by a contractor, in accordance with drawings and specifications, would necessitate a considerable staff of Government engineers, and this would be an additional expense.

Replying to another question relative to the railways being constructed by the Colony without extraneous help, Mr. Glasier said the limited number of European officials in West African Colonies have already duties fully engaging their time, but even if this were not so, it is most desirable, in undertakings involving large expenditure, that the best men obtainable should administer the work, and that the highest technical advice should be taken advantage of. In Lagos, for instance, officials had never been concerned in anything more extensive than public buildings, road-making, and such municipal work – the only concern anyone had probably had with a railway was as a passenger. It would be an expensive policy to pay for the experience necessary in endeavouring to make local officials expert railway constructors / and administrators. Until such time as the West African Colonies could be amalgamated, and an Agent-General appointed, the Crown agents were a necessity – they performed their
duties most satisfactorily, and could not be replaced by any more efficient body. It would be suicidal to allow parochial councils to still further prevail by each little colony having its own agent. In the extension of the railway existing institutions would be taken advantage of, the ‘Open Line’ staff comprised officers highly trained in administration and engineering, and they would be utilised as far as possible for extension purposes.

Mr. John Holt: There are some of the best officials in Lagos.

Sir Alfred Jones: The Congo Railway is a magnificent undertaking, but not so good for the country as that of Lagos. There is no doubt that the Congo Railway carries more valuable produce than at Lagos, viz., rubber and ivory. The French have given the concessions to contractors, and they charge 2s. per ton per mile.

I think the discussion has been very useful, and I am extremely gratified to Mr. Glasier who has been able to make such statements, and to know that we have got the railways at a fair price is very satisfactory. I believe the consulting engineer for the Coast gets something like £2,000 per year, so we have the best advice, and will go as quickly as possible. We want now to come to some practical result for this meeting – would it be wise to change the method of making the railways? – I think it would be a great mistake to change the method of construction. The question then is, should we support Sir William MacGregor in the extension of the Lagos Railway? Then I don’t think you want a sinking fund for a railway, as the railway is good security, as it becomes more valuable day by day. I don’t think we ought to try to block it when we see the 15,000 tons of kernels brought down in a year, which is certainly a good thing for the natives, merchants, and shipowners. I now put the following Resolution to the meeting, viz.: –

‘That the Committee recommend the immediate extension of the Lagos Railway from Ibadan to Oshogbo, 71 miles, at a cost of £429,000, the interest on which can be paid by the suspension of existing Sinking Fund.’

Mr. John Holt: I would rather support a Motion in general terms, viz.: –

‘That we support the proposal of Sir William MacGregor to extend the Lagos Railway, and for that purpose to take such steps as the Government may deem necessary to gain the end.’

The following Resolution was then proposed by the Chairman, seconded by Mr. John Holt, and passed unanimously, viz.: –

Resolved –

‘To recommend the prompt extension of the Lagos Railway to Oshogbo, and, if needful, the suspension of the Lagos Railway Sinking Fund.’

[...]

Mr. J. Newton: I think that the extension of the railway to Oshogbo would mean that a great deal more produce would come down for the merchants to buy, and the result would be that Manchester people would have an increased
sale of their cotton goods, &c. A great deal is being done in Africa for the construction of railways, and I think we have been rather fortunate in having such a splendid Colonial Secretary, who has placed such confidence in Manchester and Liverpool, and it will be a great pleasure when I hear that the extension has been carried out. Some people think it has been a most extravagant way of making the railway, but it has been the most efficient. I quite agree with Sir Alfred and Mr. Glasier that we should employ the best men we possibly can, and then we shall have nothing to regret afterwards. I have much pleasure in supporting the vote of thanks to Mr. Glasier.

[...]
The Right Railway System and the Best Outlets for Nigeria

THE RIGHT RAILWAY SYSTEM
AND THE
BEST OUTLETS FOR NIGERIA
(Reprinted from the ‘West African Mail,’ January 19 and 26, 1906.)

[...]

A subject of such vast and vital import as this in its bearing to our West African Empire is bound to prove of the deepest and most essential interest to all our readers. To grasp and digest the printed matter contained in this Blue Book of 203 pages (Cd. 2,787), which is divided and sub-divided into a great number and variety of despatches, reports, minutes, maps, estimates, tables and plans – documents, in fact, representative of varying interests, views and opinions – is in itself no easy matter. But when all these multitudinous differences and opinions have to be reduced and condensed into a readable and intelligible article, the difficulties before us can only be estimated at their due worth by those who have either waded through the mass of matter itself, or who possess an intimate and appreciable knowledge of the mental intricacies of official literature.

Yet there is a fascination about these pages which is only explicable to the philosopher who is interested in the psychological study of human motives. What we have attempted to arrive at on behalf of those who have neither time nor patience to read this Blue Book for themselves, is a clear and concise summary with regard to the most practical system of railways and sea bases, that will meet the full requirements of the case from every side: / from the more or less equal standpoints of commerce and administration, in their respective relation to the interests of the natives, equally with that of ourselves as protectors, initiators, and bankers.
Regarding this vast mass of correspondence solely from the estimate of time (the accumulation of six years), and its aggregate in words, amounting as this does to over 150,000, it is, indeed, a stupendous monument of official labour and methods – those laborious and roundabout methods that the sympathetically observant Dickens belaboured under the designation of ‘circumlocution’ – in popular parlance, the ‘red tape and sealing wax of official routine.’

But even making allowances for this congestion of official system, and putting it to one side, it is quite impossible to wade through so formidable an array of words and figures without being inspired with amazement; not so much as to the expression of individual opinions, as that so great a quantity of energy and so much valuable time has been allowed to pass – we will not say wasted or frittered away – by so many eminently practical individualities. And all for what? In arriving at a conclusion, the definiteness of which was, to a great extent at least, distinctly evident, if not a foregone conclusion, from the very outset.

Regarding the question at issue from a purely practical standpoint, it seems to us that the only conclusion which it was possible to arrive at was (a) to select the right system necessary for the development of Nigeria; (b) equally so, to fix on the best – i.e., the most suitable – harbours or outlets, in connection with this.

Yet simple as was the problem (we do not in any sense refer to the issue, and fully recognize the difficulties that had to be contended with), it has taken the various units concerned – the Colonial Office, the Crown Agents, the Consulting Engineers, and the local Governors or Administrators – six years merely to decide, not as to its solution, but as to the validity and soundness of the question before them.

Even now this conclusion had been only partially arrived at by Lord Elgin, the new Colonial Secretary, on 16th ult. Not a single step has as yet been adopted with regard to the initiation of any railway or harbour scheme; so that we are in reality as far off a practical realisation of it as we were in 1900, when the question was first actively mooted.

This is all the more extraordinary and incomprehensible, when we take into consideration the fact that it has occurred in a country such as England, whose commercial interests are the greatest in the world, and whose people have at least the reputation of being the soul and personification of business. This in itself is astonishing; but after having carefully and diligently studied the contents of this correspondence, it strikes us as almost impossible to reconcile the extremely glaring inconsistencies of theory and practice which are to be discovered therein.

But human nature, as thinkers of old have pointed out, is fearfully and wonderfully constructed: it is so intricately variable in fact, as to defy analysis. And if ever we have rightly gauged the depth and meaning of the phrase ‘human document,’ this Parliamentary Blue Book has brought it home to us more forcibly and luminously than almost any other that we have ever read. For there is a strong
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and undiluted flavour of humanity in every page and line of it – the humanity of personal egoism and of conflicting interests, opinions and reputations – which in a very great measure explains the existence and *raison d’être* of official routine and red-tapeism.

But with this interesting aspect of the case we are not at present concerned. We will therefore endeavour to place before our readers as pithy a *resumé* of the entire matter as it is possible, within the confined space of a few of our columns, to give.

Before doing so, however, it will be advisable first of all, as a preliminary measure, to make a study of the map of Nigeria, so as to comprehend the entire situation from every standpoint – geographical, commercial and political. Although the country / alluded to in this correspondence as Nigeria, drained as it is by the River Niger and its principal confluent, the Binue, is, so to speak, from an Imperial standard one, it is in reality, and from a human sense, divided up into numerous petty and insignificant states and communities.

Putting these to one side, however, as outside the scope of the present larger issue, there are three political divisions of this huge territory with which we have to deal, viz.: (1) Lagos; (2) Southern Nigeria; (3) Northern Nigeria; and it is with the first of these that the history of this voluminous correspondence commences.

For some four or five years prior to the beginning of this correspondence in 1900, a railway from Lagos into the interior had been started, the terminus of which at the time had arrived at Ibadan. Passing over the first twenty-two pages, which mainly concerns certain schemes proposed for the improvement of Lagos harbour, in which Messrs. Coode, Son and Matthews¹ had been taken into consultation – dating back to April, 1892 – the first portion of the Blue Book which merits our serious attention is that of two letters written between May and July, 1900: (1) from the Crown Agents to the Colonial Office; (2) from the Crown Agents to Messrs. Shelford and Son. In these communications, with regard to the Imperial unit now spoken of as Nigeria, the question of railway construction is only considered ‘as having at present hardly reached beyond the stage of discussion.’ So that it evidently does not appear necessary or desirable to the Crown Agents to incur the expense of ‘*even* flying surveys’ at present.

A few months later – on 9th August – Sir W. MacGregor, then Governor of Lagos, comes upon the scene with a strong recommendation to the Colonial Office for the extension of the Lagos Railway into Northern Nigeria, partly on commercial grounds, but also in a great measure on strategic and political premises, concluding his despatch at the same time by the remark that ‘in the present state of railway development, the harbour / works could not be undertaken at the expense of the colony’ – an argument, we think, that to some extent invalidates the financial basis of his previous recommendation for its extension, because, as we shall see later on, there are already in existence in Southern Nigeria, which is
contiguous to Lagos, the two splendid harbours of Forcados and Old Calabar, besides several of lesser importance, which, apart from any financial consideration, such as affects Lagos, are the natural outlets of a richer hinterland than is possessed by Lagos.

Almost simultaneously with Sir W. MacGregor, Brigadier-General Lugard, High Commissioner of Northern Nigeria, as he was then, had sent in a report – also, of course, to the Colonial Office – with regard to the results of his researches into the nature and accessibility or otherwise of the country to the north of the Niger, but more especially with reference to the selection of a site suitable for the Government Headquarters of the recently-formed Protectorate of Northern Nigeria: a fact that in an administrative sense, of course, was closely and directly connected with the main issue, for it was with this before his mind that the High Commissioner was guided in his selection of a site.

The year 1900, however, passed away without any strenuous effort being made in the required direction, but early in 1901, Sir Ralph Moor, High Commissioner of Southern Nigeria, entered the arena of discussion by inditing a despatch on the subject of railway development in connection with navigable harbours, to that able Colonial Secretary, Mr. Chamberlain. And here, for the first time in this history of official correspondence, we are confronted with views which, as engaging our immediate and close attention by the lucidity and business-like tenor of their expression, are distinctly worth reading. Apart from all such weighty considerations, they are without doubt the views of a personality with local experience of Lagos and Southern Nigeria, who has regarded the question at issue from a broad and comprehensive aspect. Indeed, the few headings – as given / below – under which he submits his views, demonstrate this to a great extent. These are:–

(a) In developing the territories of Nigeria by railroad, the scheme should be comprehensive from its initiation, and determine as nearly as possible what railways will be required in future to properly open up and develop the territories.

(b) The most suitable harbours for the establishment of depots for the trade of the interior.

(c) The advisability of running railways in such manner that by short branch lines they may supplement the existing water transport during those periods of the dry season when the rivers are unnavigable even by the smallest steamers.

(d) The question of the extension of the existing Lagos railway.

It is most unfortunate that space conditions prevent us from quoting this document in full, for it seems to us to have approached the main issue in the one and only way in which it was possible to approach it, viz.: to look ahead and
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determine the railways, and the natural sea outlets connected with them, which were required, and in doing so, to start with a scheme sufficiently comprehensive to embrace the most essential interests at stake, namely, those of commerce, administration, and strategy. What is more, it occurs to us that had all those who were interested in and associated with the issue, dealt with it in the same practical and business-like manner, not only would a definite decision have long since been made, but the work of development would also have been in full swing. Unfortunately, however, for development, the inevitable BUT and official circumlocution have intervened.

Having divided his subject into four principal issues, Sir Ralph Moor then proceeded to discuss each of them in detail:—

‘With regard to (a), I must submit that having regard to the extent of the territories, and looking somewhat to the future, it seems to me quite impossible that the enormous area of Nigeria can be developed by one railway. I would submit that at least two main railways are required to open up these territories with any degree of success, which, with / the water-carriage supplied by the Niger and its main tributary, the Binue, would ensure quick development through the entire area. I would suggest that one line be run into the interior to the west of the Lower Niger, crossing that river in its upper waters, and taking the direction of Sokoto, for the development of the western area. The other railway should, I submit, be run to the east of the Niger, across the Binue, in the direction of Yakoba, and thence to Kano; from the former place a branch line being thrown out in the direction of Lake Chad, and similar lines in other directions if necessary. The depot ports for these railways I shall suggest later on.’

Whether the places here mentioned, either as termini for the railways, or crossings over the Niger and Binue, are suitable or otherwise, they are questions of detail, to be settled subsequent to the final decision with regard to the settlement of the main factor. But in looking somewhat to the future, and insisting that at least two main railways are requisite to open up the territories in question, Sir Ralph Moor has undoubtedly taken the bull of this business by the horns; for if development is necessary – further, if it is to be commercially payable, by all means let it be undertaken in downright earnest, and on a scale that is commensurate with the issues which are at stake.

Referring next to (b), the High Commissioner of Southern Nigeria was of opinion that:—

‘The question of harbours is apparently the most difficult one to deal with, for there are considerations, not only of the natural fitness of the existing ports, but others of vested interests which have to be considered. This question concerns the port of Lagos vitally, and in giving my views with regard to that port I should wish first to premise that I am not in any way prejudiced against Lagos, and that the views I put forward are those which I consider to be for the best
interests of the territories; nor do I claim that my views are of any special value, though I am personally acquainted with Lagos and all the ports of Nigeria probably better than anyone who has written on the subject. In fact, I am not aware that anyone who has advised in this matter is acquainted with any of the ports beyond Lagos, and such representations as I make are put forward with a view to a thorough consideration / being given to the subject before extensive railway enterprise is embarked on. In my despatch of 26th June, 1897, to the Foreign Office, I called attention to this question of ports, and requested that before railway enterprise was embarked on due consideration might be given to it, and I understood at the time that the despatch was forwarded to the Colonial Office.

‘Counting Lagos as a port, there are, in all, nine on the coast line of Nigeria, viz.: Lagos, Sapele, Warri, Forcados, Akassa, Brass, Bonny, Opobo, and Calabar, of which Lagos is distinctly the worst, for the main line steamers cannot enter it, and into all the others the main line steamers are able to enter. At Forcados and Warri steamers can enter drawing twenty feet, at Sapele eighteen feet, Akassa fourteen feet, Brass fourteen feet, Bonny twenty-one feet, Opobo fourteen feet, Old Calabar twenty feet; and in all these ports the steamers lie in still water.

‘The primary difficulty in Lagos is the bar, and I understand that it is estimated that from eight hundred thousand to one and a half million pounds will be required to make this bar practicable to main line steamers.

‘Admitting that the bar can be dealt with, the next question is as to the suitability of Lagos itself for a depot, and I understand it is regarded as having claims to be such, based on the vested interest in the property on the island of Lagos. It seems to me that this claim is to an extent a fictitious one, for if Lagos is to be made a depot I understand that it is admitted by all who have a good knowledge of the locality, that the depot will have to be not on the island of Lagos, but on the mainland. Thus the vested interest in the property of Lagos island itself must be disturbed. Considering next Lagos and the mainland, we have the fact that the population – permanent and floating – of Lagos itself is seriously congested, and that the European and native habitations are far too contiguous from a tropical health point of view. I believe it is the opinion of experts that were an epidemic to break out in Lagos the results in mortality would be too terrible to contemplate. The island of Lagos itself is low lying and insanitary, and does not lend itself to drainage in any way. Further, there is no water supply whatever, except such as can be obtained from rain-water collected in tanks.

‘Dealing now with the mainland, to which, no doubt, a considerable portion of the present population would transfer if a depot be established, there is, I believe, a good area of / land suitable for the establishment of a large town, but again the difficulty of water supply presents itself. For I understand there is no water obtainable nearer than the Ogun river, and from that source I am told that the water supply available would not be for more than 100,000 persons, and
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it would take at least £100,000 to obtain it. It seems to me that the depôt for the trade of the interior will, some years hence, be a town of considerably over 100,000 inhabitants – indeed, several hundred thousands and it is well that this fact should be considered in any action that is taken. Having regard, therefore, to the enormous expenditure that would be required to make Lagos a port, and to the foregoing disadvantages, I submit it is a matter for serious consideration as to whether Lagos is not better fitted for the depôt of a purely local trade than for the depôt of the vast trade which may be expected to result from the opening up of the interior in future years.’

The absolutely fair and unbiassed manner in which the suitability and respective merits of Lagos and Southern ports and depôts are discussed, is undeniable. Indeed, speaking from a wide experience of these localities, we cannot but concur in the sound and commonsense conclusions here arrived at. For although we fully acknowledge the importance to the people of local and vested interests, this is a question which must be Imperially handled. But by Imperial, we mean that higher and broader factor which in its integrity enhances and consults the interests of all its component parts.

Passing over the details with regard to the capabilities of the principal ports of Southern Nigeria, Sir Ralph Moor continues:

‘Referring next to (c), at the commencement of my despatch, I certainly consider it advisable that the railways should be run in such a way that short branch lines can be thrown out to tap waterways at suitable points during periods of the dry season when such waterways become in part unnavigable. If the trade is to be developed so that it may be progressive, there must be better facilities for transport afforded in the dry season throughout the territories than the existing waterways, and I need hardly point out that peace and good order would be quickly ensured by the establishment of such a system.’

The absence of all data, or, in fact, of any information whatsoever in support of this contention is, of course, obvious. But we must recollect that up to then, reliable information with regard to the physical features, population and traffic of the country were not forthcoming. And apart from this the larger issue, and not details, was under discussion.

Proceeding next to (d) the question of the extension of the existing Lagos railway, ‘this must depend,’ Sir Ralph Moor argues, ‘on the settlement arrived at as regards the port of Lagos, and the fitness of Lagos itself as a central depôt for the trade of the interior. It is, of course, essential that the Lagos line should be extended to tap a sufficiently large area to render it a paying concern, if it be decided that it is to be relegated to the position of a local line. The area necessary for this is at the moment, I presume, rather a matter of opinion, as there is

* More than this, existing waterways ought to be utilised. /
no definite information as to traffic.’ But deferring to the professional opinion of Mr. Shelford, that an extension to Oshogbo would meet the case, he frankly admits that he has no knowledge of the Niger crossings, but fully concurs with Sir Frederick Lugard’s opinion that it is of the utmost importance, indeed essential, that the question with regard to railways and ports should be decided at the earliest possible moment, to enable the local Administrations to proceed with the development of the territories in such a manner as to facilitate the construction of the lines when they are undertaken, for much might be done in this direction by road-making and developing the trend of the trade in the directions of the railway.

Then after dealing with a few smaller issues, the despatch is concluded in the following well-weighed and rational words:—

‘In dealing with this subject I would venture to suggest that the Imperial Government should render assistance in the expenditure necessary for the construction of railways throughout Nigeria. The French and Germans are both contemplating the construction of railways through areas bordering on the territories, and it is possible that difficulties may arise in maintaining the frontiers. To provide the capital moneys necessary from local funds is absolutely impossible, and to charge such funds with the interest on the capital which it is necessary to expend must seriously delay the construction of railways, and I fear practically stop their extension, for the maximum amount with which the revenues could be charged in this manner would be reached long before the necessary lines were constructed. If a grant could be made for railway construction in the same manner as in East Africa for Uganda, the enormous expansion of trade in these territories which would follow on the opening up by railway would soon compensate for the Imperial grant, in the trade done with British manufacturers and merchants. I submit that it is for the best interest of the territories, that now, before the enormous expenditure contemplated is undertaken, the best and most efficacious way of dealing with the question should be arrived at, and further, that hitherto no consideration has been given to the facilities that exist in directions other than Lagos. It does not appear that it was contemplated carrying the Lagos line into territories which were then under the administration of the Royal Niger Company at the time it was commenced, and no provision was then made for making Lagos an ocean steamer port. I conclude, therefore, that a local line was contemplated, which would not have been undertaken had there not been reasonable grounds for calculating that it would pay its way. There are undoubted facilities in other directions for providing railway transport to the interior, which should receive consideration, together with those at Lagos, that the best means for arriving at the desired object may be determined with due regard to economy.’

The next step of any importance in the development of this great question was the meeting of the three Governors, Sir William MacGregor, Sir Ralph
Moor, and Sir Frederick Lugard, of Lagos, Southern Nigeria, and Northern Nigeria respectively, which took place at Lagos on 5th April of that year (1901): a meeting, by the way, which included a flying visit by railway to Ibadan, the then and present terminus of the local line. Unfortunately, the practical result of this conference was a negative quantity. For theoretically, there was a divergence of opinion between these selected representatives of the three units into which the area under discussion was then divided. /

Thus, the High Commissioner of Southern Nigeria, looking at the matter as a whole, was, as we have already seen, an advocate, and a strong yet unbiased advocate, for (1) the conversion of the Lagos railway into a local line, the cost of construction of Lagos harbour being altogether too great; (2) the construction of two railways: a Western, with its outlet at Sapele or Warri, and an Eastern, having Old Calabar as its sea base – admittedly the best harbour next to Freetown on the whole coast of West Africa. The Governor of Lagos, regarding it in our view from too local a standpoint, very strongly advocated the extension of the existing railway from Ibadan to Kano, or other objective in the north. And finally, the Governor of Northern Nigeria, with his own very decided opinion on the subject, favoured Sir William MacGregor’s scheme with regard to the latter, and was in accord with Sir Ralph Moor in respect to the Eastern line, and the connection of Sapele with the Lagos-Kano extension.

It is, however, impossible to arrive at any definite conclusion, without in some measure examining the general and specific arguments advanced by the different Governors in support of their own views; for a more comprehensive grasp of the various capabilities of the question is in this way attained. Condensing those of Sir William MacGregor, they may briefly be placed under the following heads:– (1) The potential argument that in a few months 120 miles of the Lagos line would be open to traffic; (2) the fact that its geographical position naturally placed on it the duty of protection from invasion; (3) the further fact that to the Empire at large, it was a matter of indifference whether Nigerian produce was carried via Lagos or Forcados; (4) that the question of the best means of defending these provinces was a broad one of great importance, which presented itself in considering the extension of the Lagos railway; (5) that this line seemed to be the natural route for commerce.

These views were further expressed and emphasised in a speech made by Sir William MacGregor a few months later on / the opening for traffic of the railway to Ibadan, an extract from which reveals his concept even more plainly:–

‘This far-reaching extension of the railway leads to consider, for a moment, the question of Lagos harbour. The probabilities are that a million sterling would make an excellent harbour there. The estimates prepared by experts are less than that.
'Now the interest on a million sterling at 4 per cent. would be £40,000 a year – I daresay more than that is now expended on maintaining branch boats. Do not forget that; and do not forget that there is also some chance that ocean-going steamers may be built that may be able to pass the bar without any great harbour works. Remember that the increase to the commerce of Lagos by the extension of this railway to the heart of Hausaland would be enormous. The £40,000 required annually as interest on the cost of the harbour would never be felt were that trade secured. Think for a moment what would be the geographical position of the Lagos harbour were it once made. It would be at the ocean end of the direct route to Kano. It would be a day or two nearer to England than any harbour that exists, or that could be made; it could not be rivalled on either side. I may say emphatically that the harbour question may be left alone at present. Existing arrangements will suffice till this railway arrives at Kano, and then you can tackle the harbour with a light heart.'

Similarly, in analysing the governing ideas which actuated Sir Frederick Lugard, it is at once evident that certain prominent local views had also guided him in his conception of the question at issue. Thus he never loses sight of the ultimate destination and course of the railway, and especially of the point at which it should cross the Niger, with regard particularly to the selection of an Administration centre in Northern Nigeria. But although alive to the commercial possibilities of the situation, he in reality, like Sir William MacGregor, primarily bases his concept on strategic grounds. In his own words, ‘the extraordinary efforts made by France in the matter of railway extension in West Africa would appear to force upon the British possession of Nigeria some corresponding effort as a measure of defence, even though it might have been considered premature from the point of view of development only. It is, therefore, chiefly from the former standpoint that the urgency of railway construction should, in my view, be considered.’

Passing over the many salient features which are only too open to criticism, we are now confronted with the opinion of Sir Ralph Moor. And again it appears to us that he goes into the heart of the matter in a much more systematic and comprehensive manner, dealing with it as thoroughly and exhaustively as it is possible to do under the circumstances, and considering as he does the strategic importance of the question at the same time that he subordinates it to the commercial. In his estimation, the finance question is the one of all others which must be dealt with first. Prior to this, however, he had stated in concise and definite language, which does not admit even the possibility of misconception, his entire disagreement with Sir William MacGregor, with regard to the question that the harbour can be left alone. ‘I submit,’ he says, ‘that the extension of the railway and the construction of the harbour practically form but one question. For if it be determined to extend the railway, I submit it is essential for dealing
with the traffic that may be expected to result, that steps be at once taken to provide a suitable port and harbour.’ These words, quite irrespective of the practical arguments with which he supports them, speak for themselves; and so, we think, do those in which he discusses, in a broad and general manner, the primary and all-important question of finance.

Space limitations prevent us from quoting in extenso his views on finance, the consideration of which is based on an investigation of the existing revenues, the present development, and the future prospects of the three units concerned, with a view to estimating what, if any, portion of the cost of construction of this railway could be borne by them. Taking the three revenues of Lagos, Northern Nigeria, and Southern Nigeria at £210,000, £25,000, and £364,593 respectively, Sir Ralph Moor goes on to show that while the two latter units are yet in an absolutely undeveloped state, with every prospect of a great increase in the revenue, especially in Southern Nigeria, the revenue of Lagos has of recent years diminished very considerably, a fact that, taken into consideration with other matters, demonstrates to a great extent the full development of the territories in question. But even mitting that this is not altogether the case, having regard to the figures and details which he has given, Sir Ralph Moor is still of opinion that none of the Administrations are in a position to bear the initial cost of the railway. And in this – from a strictly economic standpoint – he was perfectly right.

Then follows a recommendation as to the soundest method of incurring this expenditure, which is best given in his own words:

‘The Lagos railway will, I should anticipate, certainly not pay its maintenance, upkeep, and working expenses from the traffic derived in Lagos territories proper, and the extension to Northern Nigeria is not likely to pay such expenses until some considerable time after its completion. It may, therefore, I am of opinion, be anticipated that for some years to come there must be considerable charge on the revenues for maintenance, upkeep, and working of this system. It seems to me hardly likely that the revenue derivable from Lagos and Northern Nigeria for some years to come would be able to meet this expenditure, and also to pay interest on the cost of construction; and the revenue derived from Southern Nigeria could hardly be called upon to assist in meeting such expenses, considering the contribution it is now called upon to make for the administration of Northern Nigeria, which is about £20,000 in excess of the amount of revenue collected for that Administration. Taking the eastern railway system proposed, practically the first use of the railway in this area would be to conquer, open up, and control the territories, during which period the traffic would be comparatively small; and this argument applies also to some extent to the western railway system, so that the maintenance and upkeep of railways in these territories will, in my opinion, in the first few years of development, tax the resources of the Administrations to the utmost, without attempting to pay any interest on the cost of construction.
‘It follows from the foregoing paragraph that my view is that the cost of the construction of the railways throughout Nigeria should be borne by the Imperial Government, and on looking into the circumstances of the territories, it does not appear to me that this is in any way unreasonable. The estate of Nigeria has been acquired by his Majesty’s Government at little or no cost beyond the monies paid to the Royal Niger Company, amounting to about £865,000, and the additional cost borne by the Imperial Treasury, exclusive of grants-in-aid of Northern Nigeria, since the territories were first acquired would not, in all probability, increase this sum to beyond £1,000,000. The entire cost of the local Governments, and the cost of opening up and developing of the territories of Lagos and Southern Nigeria, is provided from local funds, and contribution is made towards the Administration of Northern Nigeria from Southern Nigeria funds, amounting to £34,000, which is, as before mentioned, some £20,000 in excess of the revenue collected for that Administration. The remaining cost of the administration of Northern Nigeria is paid from Imperial funds, and for the current year a sum of £283,269 is provided. I take it that the first thing to be aimed at is to make the Administrations self-supporting, and the entire revenues of the territories should, I submit, in first instance, be devoted to this purpose rather than to paying interest on loans for railway construction. It seems to me probable that for the next ten years there will require to be an Imperial contribution to the Administration of Northern Nigeria, which should, however, be an annually decreasing one, particularly so if the local funds of the other Administrations in Nigeria are not saddled with interests on railway construction loans. At the end of that period the contributions from the Imperial Treasury for the Northern Nigerian Government will probably have amounted to about two millions, which, with the million previously referred to, will amount to three millions in all. I would submit that the estate of Nigeria is worth an infinitely larger sum than this to his Majesty’s Government, having regard to the benefits derived in England from its possession, in profits made by manufacturers, merchants, and shipping companies, and in wages provided for mechanics, artisans, and labourers. The increase in these profits and wages depends almost entirely on the opening up and development of the territories, which can only be effectually done by railways, and I would venture the opinion that a further expenditure from Imperial funds of £10,000,000 to £15,000,000 of money for railway construction, admitting, as I think may be done, that the local revenues would maintain and upkeep the railways when completed, would eventually be justified by a proportionate increase of these profits and wages accruing to British merchants, manufacturers, shipping companies, mechanics, artisans, and labourers. The figures showing the trade done with Great Britain and Ireland by the whole of Nigeria are not available for demonstrating this, as no records of shipping and trade are available for the past years, owing to no returns having
been published by the Royal Niger Company; but when the returns for the past year are completed some figures showing such trade will be available. I estimate that the value of the trade of Nigeria with the United Kingdom is about four millions per annum, which in the course of the next ten years should increase enormously, probably to more than twice that amount if development anticipated in the territories occurs.

‘I submit that some definite scheme for the development of the territories should be determined on, in order that the work of the Administrations may be conducted on systematic lines, and also that there should be some definite understanding with regard to the method in which local revenues are to be applied, and provision made for such development and opening up of the territories.’

These, it seems to us, were far-reaching words, based on sound and practical premises, which in principle at all events, although not in detail, were in entire agreement with the policy of development advocated by Sir Frederick Lugard, that ought at least to have produced some good and practical effect. Yet the immediate effect resulted in a mere shuffling of the cards in the old official game of ‘circumbendibus.’ In other words, the Colonial Office referred the matter to the Crown Agents, who in their turn passed it on to the Consulting Engineers.

This was the initial stage. A scheme was then drawn up, or rather a professional opinion was drafted out by Messrs. Shelford and Son, which was forwarded to the Crown Agents, and submitted by them to the Colonial Office. This, again, was the R.S.V.P. stage, leading up to the reconsideration of its own proposition by the Colonial Office, and the sanction, not in any sense of the scheme or even any considerable portion of it, but of a Flying Survey regarding the most suitable route beyond Ibadan, and known as the Egbon-Jebba-Ilorin Survey.

It would, from our point of view, be a sheer waste of valuable time to enter into any details or otherwise over the belated and long-winded correspondence that extended over the next two years / or so. In Messrs. Shelford’s own words, ‘that these points’ (those under discussion) ‘will no doubt settle themselves by discussion in due course, the question at the present moment being rather the extension of the Lagos railway,’ the entire position is most picturesquely yet forcibly illuminated. ‘Discussion’ in fact is the corner stone and centre of the position; while the impression left with regard to that specific portion of it which is confined to the Colonial Office, the Crown Agents, and the Consulting Engineers, is one that is productive of reflection, but more so in the direction of those principles which are commonly defined as reflexion and reverberation.

It is not in the least surprising, therefore, that of the three Flying Surveys suggested by the Consulting Engineers early in 1902 – one and all of which were most essential, as an initial stage of the proceedings – the first-mentioned alone was sanctioned ... and did not commence its operations until October, 1903.
A few points, however, in this maze and tangle of words stand out with some prominence, and these are:— (1) That the extension of the Lagos railway was to be carried out as far as Oshogbo as soon as funds permitted. (2) That its objective was to be Kano and not Sokoto. (3) That in tropical and wooded countries, it was impossible to obtain the best line by any means other than that of approximation. This had been found to be the case with the other West African railways. Surveys had been begun by a reconnaissance or flying survey, and each successive survey, more elaborate than the last, had shown that further improvements were still possible before the best line through the country could be determined on. (4) That in Messrs. Shelfords' opinion a definite scheme of development must be deferred until decisive information had been obtained.

So that the conclusions they arrive at as a result of the report of Mr. Gee – the Chief Engineer who had been in charge of the Egbom-Jebba-Ilorin Survey, are as follow:—

'(1) Jebba is by far the best site for crossing the Niger by a bridge, from the point of view of economy in construction, but it is rather too far west of the straight line from Lagos to Kano, which would be the shortest route, giving the best result.

(2) The route from Ilorin to Jebba is practicable for a railway, put passes through barren country.

(3) If for these reasons Jebba is considered unsuitable Shonga appears to be the best place east of Jebba.

(4) Kaduna Mouth is believed to be an impossible site for a bridge.

(5) The route from Ilorin to Shonga is a 'trade route,' and is considered an easier road than that from Ilorin to Jebba. It has not been surveyed.

(6) A ferry could probably be worked across the Niger at almost any point, although in some cases it would be necessary to steam round islands in the river. A wire ropeway could be worked at Jebba with advantage during the construction of the line and until traffic developed.

(7) Considerable light has been thrown upon the problem of determining the route by which the Lagos railway should be extended beyond Oshogbo, and the best crossing of the Niger, but definite decision upon the matter is rendered impossible by the almost complete absence of reliable information with regard to the country north of the Niger.'

And added to this were these recommendations:—

'(1) From Wushishi as a centre to Zaria, or still better to Kano, by one or more alternative routes.

(2) From Wushishi as a centre to the Niger at:—

(a) Jebba.

(b) Shonga and thence to Ilorin.
(c) Kaduna Mouth, or any other point considered desirable.

‘By making Wushishi the centre and base of operations the routes to be surveyed are diminished in number and the difficulties of the survey parties would be greatly decreased.’

From this onward, as far as the Administrators are concerned with the correspondence, Sir Frederick Lugard has it all to himself. But many and valiant as are the efforts he made in endeavouring to impress upon the Colonial Office the urgency and expediency of building the railway, there is no visible turning in the official fane – no end in view; for, like a West African bush / path, it is too tortuous. So in sheer desperation he recommends the temporary construction of a line from Kano to the Niger, and not to the sea.

‘I submit,’ he says, ‘that on administrative, military, and commercial grounds, the necessity of this line is most urgent [the italics are his own] and that its construction should be undertaken quite independent of the Lagos railway’ – and then he proceeds to explain his reasons for such urgency on the four following substantial grounds of (a) commerce; (b) policy; (c) strategy; (d) finance: with a greater knowledge of the situation, and a modification of his earlier views, but laying, it seems to us, greater stress on the danger of French competition, consequently on the advantage of being in front of them by the construction of a light surface railway, than on the financial and commercial side.

One thing, however, that is most obvious all through his effusions, is the thorough earnestness and sincerity of the man as a unit of a great Empire; also of the Ego, as one of the administrative units who is helping to shape the destinies of one of its many portions. And this is a spirit, whether we be in accord with his views or not, that we cannot but be in sympathy with. No matter how much sounder and more substantial are the calm and studied methods of mathematical calculation and accuracy, sincerity is a quality so rare in these days of over-haste and rapidity, that apart from the exhilaration of its infection, we hail it as a most essential factor in the policy of all true development and extension.

Yet, ably backed up as Sir Frederick Lugard was by Mr. Eaglesome, his own Director of Public Works, an engineer of considerable Indian experience; the Consulting Engineers – now supplemented by the accession to their firm of Sir Benjamin Baker – were altogether opposed to the construction of a light surface railway. This, too, is all the more significant, because the conclusions reached by Mr. J. D. Weir – the Engineer who / had charge of the Baro-Kano survey, 1903–4 – were in some measure in accord with the alternative scheme put forward by Sir F.I.ard, and different to those of Messrs. Baker and Shelford, which of course were not only based on this report, but also on the experience of some of the greatest railway experts in other parts of the world.
It will be as well, however, to first of all study the objects of this survey, as described in the instructions issued to Mr. Weir by the Consulting Engineers. These were:—

‘(a) To determine whether Baro is suitable for adoption as a port and terminus of a railway to Bida, Zungeru, and the northern portion of Northern Nigeria.

‘(b) To ascertain whether it would be possible to construct a bridge across the Niger at that place, and to obtain information from which an approximate estimate of the cost could be made.

‘(c) To survey the route of a light railway between Baro and Wushishi via Bida.

‘(d) To determine by flying surveys the best route to be followed by a railway from Wushishi to Zaria, and to make a more detailed survey of the route so selected.

‘(e) To ascertain the routes by which trade is at present carried on, and which might become feeders to the railway or maintain competition with it.

‘(f) To report on the navigability and seasonal rise and fall of the Niger.

‘(g) To make enquiries with regard to the possibility and comparative advantages of a route between Jebba and, say, Gwari, through the Kontagora country.

‘(h) If time permitted, to make a flying survey to Kano.’

Having completed his survey, and after careful consideration of the data which he obtained by personal observation and from various sources, Mr. Weir was led to the following conclusions:—

‘(1) A light narrow gauge railway, such as advocated by the High Commissioner, would meet the immediate requirements of the Administration, and be sufficient for the existing traffic. /

‘(2) Baro would be a good starting point from the Niger for such a line, if no suitable terminus can be found between the mouth of the Bako and that of the Kaduna.

‘(3) The limitations imposed by a railway of so light a type, and by the difficulties of navigation above Lokoja during two months of the year, would not permit of the development of the country to the full extent of which it is capable.

‘(4) A bridge over the Niger to connect Baro with the Lagos railway system would be practicable but costly.

‘(5) No great development of industry and trade need be looked for unless transport facilities are provided by the construction of a railway.

‘(6) Such development is likely to become more difficult the longer the construction of the railway is postponed.’
The Right Railway System and the Best Outlets for Nigeria

It is needless once more for us to investigate the details of the report submitted by the Consulting Engineers to the Crown Agents on 28th February, 1905, a summary of which is quite sufficient for our purpose.

‘(1) The immediate construction of a railway from the Niger to Kano is essential to the agricultural and commercial development of Northern Nigeria, and would enable the Government to reduce the cost of administration while increasing its efficiency.

‘(2) The conditions of navigation of the Niger at and above Baro, although inadequate for the traffic which is ultimately to be expected, are sufficient to justify the selection of a port in that neighbourhood as the present starting point of the railway, and a material saving in first cost will be effected if a suitable site for this port can be found north of the confluence of the Bako with the Niger.

‘(3) In view of the probable rapid development of traffic from the large area to be served by the railway, and the necessity for its ultimate extension to the sea, either by linking up with the Lagos railway system or independently, the line should be constructed upon the 3 ft. 6 in. gauge.

‘(4) A line on the 3 ft. 6 in. gauge, to the Lagos standard, with rolling stock and provision for working stores and capital would cost £2,300,000; and there is every prospect that within a very short period of its completion, the net earnings would be sufficient to meet the capital charges on this amount. /

‘(5) A temporary light line on the 2 ft. 6 in. gauge, although effecting a saving in first cost, cannot be recommended.

‘(6) A line on the 3 ft. 6 in. gauge, of a lighter type than the Lagos standard, would effect a saving of £300,000 in first cost, but we do not recommend it unless the saving of this amount is considered to be of extreme importance.’

This, as usual, was followed up by the Crown Agents forwarding this report on 19th April, with some remarks thereon of their own, to the Colonial Office. Some of these, pertinent as they are with respect to the solid and immovable principles of circumlocution, therefore indicative at least of the present fate of the great issue, are worth reading. One extract will suffice:–

‘Much, therefore, as we should like to see a railway in Northern Nigeria started at the earliest possible moment, we cannot arrive at any other opinion than that under existing conditions, and with the small amount of information at present in the possession of the Government, it would be disastrous to fetter the future by taking any precipitate action. It appears to us that the proper course would be the despatch of further reconnaissance survey parties to collect all the possible information, and so enable the Secretary of State to decide on the
route to be adopted, before any construction work is taken in hand. If this course of action should approve itself to the Secretary of State we would suggest that the further examination of the country should be systematically taken in hand, bearing in mind that what is really required is information sufficient to enable a broad and general policy to be laid down for future railway construction in Nigeria. A general scheme of this kind, it will be remembered, was tentatively laid down in 1900 in regard to the existing West African railways.’

Comment on our part is futile, for words such as these speak for themselves, as words of a mere connecting link in a system the various units of which dovetail one into the other.

But, as if taking them at their word, the great and important issue at stake has, until just the other day – 16th December – been allowed to have a well-earned rest. On that day, however, the question was once more reopened by Lord Elgin – the new Secretary of State for the Colonies – who addressed a despatch / to Sir Frederick Lugard, which, while pronouncing Messrs. Baker and Sheldford’s scheme of the broader gauge as definitely conclusive, also agreeing with it in principle, leaves the matter where it has so long been – in the pigeon-hole of consideration. And there we fear – much as we hope not – it will remain for another considerable period.

But under circumstances such as these, the only thing to do is to philosophise. Reflection and soliloquy are useless. According to the poet and philosopher – ‘everything comes to him who waits’ – even costly railway systems. But unfortunately for those who are really interested in Nigerian development, there is just the possibility that the wait may be a trifle too long and too late in this instance. And this is just where the rub of the whole question comes in.

We cannot, however, close this great volume of correspondence without a sigh and a pang – a sigh of vain regrets, and a pang of disappointment. Indeed, the futility and pathos of it all is too pathetic for words. For if it is true, according to the Aryan philosophy, that man was born to action, it is equally true, from the standpoint of Western practice, that action at times must be muzzled and reserved until it is required, or can make its own way. Which of these principles is right we will not pretend to argue. All we do say is that it is unfortunate so much valuable time has been spent, and, what is worse, to so little purpose beyond the accumulation of a large number of words. For important questions relative to political and commercial economy, we are told that time is, without doubt, the most valuable factor in existence and operation. More than this, that it is an irrecoverable quantity.

If this is the case – as from experience we believe it is – then we can say no more; we can but marvel at the utter incomprehensibility of it all.
Programme of Tour.

1. The principal objects of the tour were to ascertain the sections of the Niger navigable for steam-propelled vessels of any size, as compared with canoes controlled by paddles or poles. For this purpose, on the outward journey, visits were made to Bajibo, Wuru, and to Sekachi, where the northernmost of the series of
rapids is situated. The river was subsequently traversed from Sekachi to Gaya, the first French post over the frontier, situated on the left bank opposite the future terminus of the Dahomey Railway, and recently connected by telegraph with Northern Nigeria via Birnin Kebbi. On the return journey, Sokoto River was ascended as far as Kiende and Kurgu. In order to save time and acquire some knowledge of the country, the outward journey to Yelwa was made by land. There was no time to examine the country between Jebba and Yelwa from a railway point of view; so, as the existing maps are most unreliable, a carefully contoured reconnaissance at a scale of one inch to one mile was carried along the route followed. On the return journey a different road was followed for the greater part of the distance, the remainder of the return journey being made by canoe in order to save time, and seize this opportunity of traversing all the principal rapids, except Wuru, which was not yet passable. Four days were spent in studying the approaches to the Niger at and near Sekachi above the rapids. Every opportunity was taken of studying the existing and possible trade of the country, prices of commodities, and roads followed by the present trade, and I am indebted to Messrs. Clarke and Newton, Residents, Yelwa and Bussa, for valuable information in this respect. Special attention was paid to the question of possible competition by the French Dahomey Railway.

**IMPORTANT POINTS NOTED.**

2. The following points become evident as the result of my tour:—
   
   (a) The River Niger is unnavigable for steam vessels of any kind between Jebba and Sekachi.

   (b) The River Niger is navigable for steam vessels from Sekachi to the frontier, and certainly up to Gaya. Native canoeemen are unanimous in stating that vessels of at least 18 inches draught could work on this section at dead low water, and that vessels of 4 feet draught could run for a considerable portion of the year, and all my supplementary enquiries tended to indicate that this estimate was on the safe side. A few rocks, the approximate positions of which have been noted, would have to be buoyed, and in one or two instances it would be advisable to remove small rocks.

   (c) The distances by road or water from the Sokoto markets to a British Railway terminus at Sekachi, and the proposed French one at Gaya are for all practical purposes the same.

   (d) The principal existing export trade is in live stock, after which comes potash, after that again skins. The principal imports are kolas, cloth, and salt. Although a large number of traders use the Jebba route, the greater part of the Sokoto trade goes to Lagos by a road which closely follows the Dahomey frontier. At present all this trade goes to Lagos, but the
French are beginning to draw the local trade over the border near Okuta by establishing markets and taxing salt from Lagos, and they will doubtless make a bid for the through traffic when their railway reaches Paraku. At present our Western frontier can only be visited at rare intervals by the Resident, Bussa.

The whole of the South of Kontagora, and I am informed the whole of Borgu, is swarming with shea trees, though this year has been an exceptionally bad season, and there are believed to be a large number of trees in the South of Sokoto Province away from the swamps.

Cotton is freely grown in Kontagora, Borgu, and South Sokoto. It is sold in Yelwa market from 1.25d. to 625d. per lb., according to the season; the price on the 6th August, 1911, was 8d. Serikin Gomba sent a man to Kaoge to buy cotton in the open market, and he returned with rather more than 5 lbs. for 6d., and informed me that the price was unusually high. Samples of cotton from Yelwa, Kaoge, and Kiende have been brought done for examination. It is presumably possible to improve the quality of the cotton by selection of seed, but the figures are significant in view of the difficulty experienced by the British Cotton Growing Association in buying seed-cotton at 1d. per lb. in Kano and Zaria Provinces.

The Dahomey Railway is working to Savé, 160 miles from their port of Cotonou. The new 150-million franc French West African loan now under consideration provides for the extension of the line to Paraku, mile 274, and a branch thence to Djougou (Zugu). This place, which is situated on the West of Dahomey, must not be confused with the place of the same name between Nikki and Kandi on the East of Dahomey. The distance from Cotonou to Koki (opposite Gaya), the proposed terminus of the Dahomey Railway on the Niger, will be about 465 miles.

Recommendations.

3. The general scheme recommended divides itself into two stages. Firstly, the construction with the least possible delay of a 3 foot 6 inches line on the Baro-Kano Railway standard from Jebba, or near Jebba, to Sekachi, on the left bank of the Niger. The direct distance is about 125 miles, and a railway would probably be about 140 miles long. Without this link the commercial development of Sokoto and North Borgu is impossible, except by the French Railway when it is completed to the Niger. The opening of 140 miles of railway would also at once render available over 100 miles of navigable Niger, and also the Sokoto River, which is already regularly used by trade canoes to a comparatively small extent as far as Jega. It would also be a great stimulus to trade, owing to the reduced cost of transport, and we would at once be on practically even terms with the facilities
which could eventually be offered by the Dahomey Railway, and should have secured the bulk of the trade before the latter railway reaches the Niger.

The reasons for starting the line from Jebba are overwhelming, and will be submitted in the final report. It is possible that the question of diverting Kano and Zaria traffic from its natural route, via Baro, may be met by giving the Lagos Railway a legitimate sphere of development in Northern Nigeria.

It is recommended that a marine officer should visit the river between Sekachi and the frontier at dead low water, when he could ascertain definitely the minimum depth of channel on this section, and carry out the necessary removal of snags and rocks with a small party in one season. A small service of tugs and barges should be started as soon as the railway reaches Sekachi, and could be extended as trade develops. If this is not done, and native canoe transport is relied upon to feed the railway, not only will the development of trade be retarded, but the French Railway on arrival at Gaya might secure the trade by establishing a Marine Service.

As regards the chance of such a line paying, there is no doubt in my mind that it would pay its way within five years of the completion of construction, probably within three or four years, and should there be any chance of one of the large meat firms exploiting the cattle and sheep trade on a large scale, the prospects of the line would be correspondingly improved.

As a preliminary measure, it will be advisable to use the influence of Residents to divert the Sokoto traffic from following the road along the French frontier to the Yelwa-Jebba road, which it used to follow in the old days. It is also recommended, as suggested in the previous correspondence, that a steel canoe be allotted to the Resident, Sokoto, to facilitate the survey, clearing, and improvement of the navigation of the Sokoto River, to Jega and Sokoto. There is a large number of snags in the Sokoto River between Kiende and Gomba, and also probably above Kiende, which would have to be removed before the river could safely be used by steam vessels.

The second part of the scheme recommended is the eventual extension of the railway to Sokoto, via Jega. The Sokoto River is quite insufficient as the sole alternative to road transport for the commercial development of the most densely-populated portion of Sokoto Province, though it would be a useful feeder to a railway.

The engineering difficulties of the above proposals are not great, and will be dealt with in a final report [...]

H. O. MANCE,  
Captain, R.E.  
30th August, 1911.
Report.

General Remarks on Tour.

1. Previous correspondence on this subject will be found in M.P.s. 540/1902 and 5307/1907, the principal communications being the report by Lieutenant Gordon on a voyage by the French flotilla with Captain Lenfant from Fort Goldie to Ilo, October to November, 1901; a report by Mr. Gowers, Resident, Sokoto, on the development of water transport in the Sokoto Province; and a report by Mr. Dwyer, Resident, Baro, on the Niger from Bajibo to Ilo, with particulars of Sokoto trade.

2. In view of the altered complexion which a question involving so many factors might easily take at any moment of the investigation, an absolutely free hand was given to me during my recent tour.

3. The information contained in this report is compiled from the reports in the above-mentioned M.P.s, from information obtained during my tour, and from French Colonial papers. In cases where the information given below is at variance with previous reports every care was taken to verify the alteration. It is quite possible that some of the information of secondary importance obtained by hearsay may be inaccurate, as the time available did not admit in every case of the examination of independent witnesses, with a view to corroboration. The information is given in detail, with a view to facilitating any further enquiries which may be undertaken.

The River Niger and its Navigable Tributaries.

4. Jebba to Sekachi. – (a) The first rapids met with going north from Jebba are at the north end of the Island of Djekede, not far from Bajibo. They are classified as ‘lesser rapids’ by Lieutenant Gordon, and by Mr. Dwyer as being dangerous for heavily laden canoes in the low season. Mr. Watts, of the Niger Company, on two occasions several years ago took up a twin screw steamer drawing five feet to Leaba at the highest water. He considers it a risky procedure and states he was nearly wrecked at the Juju rock at Jebba near the existing wreck and that navigation for steam vessels is not safe above this latter point. At Bajibo a number of rocks are visible in the bed of the river at low water, and there would be considerable risk at Leaba from the rocks bordering the river and submerged during high water. Captain Lenfant,⁴ in his book ‘Le Niger,’ published 1903 (Hachette), reports difficulties all the way between Bajibo and Leaba and still greater ones between Leaba and Wuru.

(b) The next important rapids are those at Wuru. The many mishaps at this place are reflected in the local superstitions. At the worst part of the main rapid the river is about 60 yards broad, and the current at low water (July 12th) must
have been from 15 to 20 miles an hour between the rocks visible at intervals across this narrow waterway. The branch following the right bank was high and dry on the 12th July, 1911, and not deep enough for the passage of canoes on the 15th August. On the former date it had the appearance of a steep path about 20 feet wide bounded by rocks some 15 or 20 feet high with jagged tops. In the centre of this narrow channel are some sharp pointed rocks. The whole passage is covered at highest flood, when the river becomes nearly 600 yards broad, with thousands of sharp rocks at varying distances under the surface. It is not to be wondered at that in a falling river canoes are broken every year. Such few canoes as pass at low water are dismantled into their two component parts, carried round the rapids, and reassembled at the other end. On the 15th August two large trading canoes from Yelwa had arrived above the rapids, and the owners proposed to transfer the loads to other canoes below the rapids.

(c) From the above it was evident that the Niger must be regarded as absolutely unnavigable, except for canoes, between Jebba and some point above the rapids. It remained to be seen whether this point is at Bussa or Warra, or whether the two lesser rapids at Sulu and Sekachi, and a short length just below Yelwa, reported to be bad at low water, extend the unnavigable section. For this purpose, Sekachi rapids were traversed at low and medium water. For about six miles from Sekachi towards Yelwa all the river channels are crossed at intervals of from 100 to 400 yards by lines of rocks appearing at close intervals above the surface at low water. At this period there is only one safe channel for large canoes, which have to pass between the rocks of some of these bars in a skew-wise channel only 20 feet wide. There is plenty of depth of water, the shallowest sounding in the channel being over two feet, and large canoes can safely pass all the year round with ordinary care, though the current is swift in places. Under these circumstances, no steam-propelled boat, uncontrolled by poles or paddles, would survive more than a few weeks. The day before I arrived, three canoes with strangers attempted the wrong passage which they had previously traversed at another season of the year, and they were broken up.

It is significant that canoemen, when asked whether they considered the journey Gomba to Sekachi and back easier than Gomba to Karimama, all asked if I meant Yelwa or Sekachi, and stated if I meant Sekachi the former would be the preferable journey.

(d) Between Yelwa and Bussa there is an awkward place at the Sulu rapid where there was a clear drop of about 18 inches on August 12th, and the canoemen insisted on lightening the canoes. The river is crowded with rocks between Warra and Bussa, resulting, I am informed, in occasional accidents.

(e) The Malali and Patashi Rapids between Bussa and Wuru are both difficult for canoes to navigate, and on August 14th necessitated long portages to
lighten the canoes. Between these rapids the river abounds with rocks. It is not necessary to enter into a further description of this part of the river.

(f) It would be possible at high water to send up a steel canoe right past the rapids – one has already been employed in the past at Yelwa. With expert supervision it might be possible to transfer a sternwheeler canoe of the ‘Swan’ type past the rapids if desired.

(g) It is hopeless to think of improving the navigation of the river on this section, and a fundamental necessity in any scheme for the economic development of Sokoto and the north of Kontagora and Borgu is a branch line from the existing railway system to a point above the Sekachi Rapids.

5. Sekachi to Gaya. – (a) From Sekachi to Ilo, about 90 miles, the channel is from 300 to 800 yards broad, but the river floods its left bank for a considerable distance at high water, when, I am informed, it is, in places, over 3 miles broad. A low range of hills from 60 to 100 feet in height follows the right bank, now defining the river by a precipitous slope, now retreating a few miles behind a tract of swamp. Along the right bank the water was frequently beyond the depth of the longest canoe pole and, as a general rule, the main difficulty of the canoemen was to get a satisfactory purchase for their poles. Native observation of depths beyond that necessary for the largest canoes (up to 18 inches) is unreliable, but the canoemen were unanimous in stating that a draught of 18 inches was available from Sekachi to Karimama at the lowest water and that the ‘Empire’ (drawing about four feet) could get to Ilo easily at high water. Surugu was mentioned as the shallowest place up to Gomba, and possible bars were noticed between Lafagu and Kawachi, between the River Kwa and Garawassu, and a few miles south of Gaya. All my supplementary enquiries tended to indicate that this estimate was on the safe side, and that at a time when the water had not risen 25 per cent. (24th to 31st July) there was a draught of at least four feet right up to Ilo, if not to Gaya. There exist obstacles, however, in the shape of occasional rocks between Jebe and Baterratere, between Kwunje and Maie, at Gendenni and Giri, and between Garu and Gaya ( [...] ). Most of these rocks can easily be avoided if buoyed, but in a few cases a line of rocks extends across, or nearly across, the river, and the best channel is a narrow one at low water. I am of the opinion that all these rocks could be made safe for stern wheelers in the course of a single season by one buoying and blasting party. There is plenty of depth between the rocks, but the removal of a few small rocks would afford a straighter channel. There are a few dangerous snags on this section [...] . These would not take long to remove. Canoemen assert the river is as deep above Gomba as below. An ordinary canoe can go from Sekachi to Giri (Ilo) in six or seven days. By having / extra canoemen it is possible to do this journey comfortably in five days,
halting at Gunugu, Ganti n Fadama, Tungan Gomba, and Yantilla, and to reach Gaya in two days more, halting at or opposite Madekali.

6. **Gaya to Ansongo.**—Canoe men assert that the largest canoe fully laden can always reach Karimama, but the Commandant, Gaya, states that there is a sand bar at Tara, a few miles above Gaya, which is only about nine inches deep at the lowest water. There appear to be other bars, but no dangerous rocks below Kompa. Above Kompa to Ansongo the river is navigable for poling canoes and barges drawing from 14 to 16 inches for the whole year, excepting a period of one month to six weeks at dead low water, when the rocks are dangerous. Lenfant was held up in this way during June and July. During ordinary low water there is always a chance of a puncture of the steel canoes and barges employed, but no personal risk. The principal rocky sections are Kompa to Kirtashi, Jirafi-eri to Fort Achinar, Bobo, Farka to Ayoru; and the worst rapids are Labezenga, where they become falls at low water and are difficult to negotiate. At Ansongo the last of the rapids is passed and this place is accessible from above by boats drawing three feet from September to early April, by boats carrying 20 tons and capable of towing 40 tons of cargo up to the end of April, and by boats drawing 16 inches and capable of carrying 3,000 lbs. of cargo in addition to coal and two passengers up to the end of May. It is not proposed, however, to use the first type of boat between Kabara (Port of Timbuctoo) and Ansongo. From Ansongo to the next rocky section of the Niger, namely, Koulikoro, the terminus of the railway from Kayes on the Senegal River, there is a navigable section of 1,400 kilometres (about 900 miles).

7. **Rise of Niger.**—At Gaya there are two floods. The first, reaching its highest at the end of August (though late this year), is due to comparatively local rains. The second, arriving at the end of November and lasting till the end of February, is due to the tardy arrival of rains from French Guinea. I was informed at Gaya that the latter rise is the highest and amounts to just under 4 metres (13 feet), being about one metre higher than the first flood. Captain Lenfant, however, reports that in 1901 the peak of the first flood at Gaya touched 4 1/3 metres, while the second flood was highest at only 3 1/3 metres at the end of February. At Gomba I was informed that the high water usually lasted from the end of August to December and January. By this time the river has flooded its banks, and a three-feet rise at Gaya would probably produce an imperceptible increase in depth over so large a breadth.

Repeated enquiries were made regarding the total rise of the Niger between low and high water, and the results set forth below are fairly consistent:

<table>
<thead>
<tr>
<th>Place</th>
<th>Rise</th>
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<tbody>
<tr>
<td>Gaya</td>
<td>13 feet.</td>
</tr>
<tr>
<td>Lafagu</td>
<td>14 feet.</td>
</tr>
<tr>
<td>Ganti</td>
<td>9 feet.</td>
</tr>
<tr>
<td>Sekachi</td>
<td>9 feet.</td>
</tr>
</tbody>
</table>
Tillo 10 feet.
Yelwa 12 to 13 feet.
Wuru 40 to 45 feet.
Leaba 45 feet.
Bajibo 20 to 28 feet (Captain Lenfant reports 23 feet).

The small rise at Sekachi may be due to the comparatively rapid descent just below. This is an important fact in any scheme for approaching the river above the rapids.

8. Sokoto River. — The Sokoto River is open for about 60 miles to Bunza, whence the Gulbin Gindi is open for some 30 miles to Jega for small canoes all the year round and for large canoes July to February. The Sokoto River, which was ascended by me as far as Kurig, is plentifully sprinkled with snags, many of them big ones. They are, presumably, the accumulation of a large number of years, and though they do not interfere with the passage of canoes, the fact that they were sometimes unexpectedly encountered below the surface emphasises the necessity for clearing the snags before risking a steam vessel on the river. This operation would take some time and trouble, but once done it seems probable that the number of snags to be removed annually would be insignificant. The Sokoto River is about 60 yards wide between its banks, which are in many places flooded at high water. Up to Kiende there appeared to be a four-feet channel the first week in August. The frequent turns in the river and its swift current make it probably unsuitable for our present tugs towing barges or for larger vessels than the ‘Kampala.’

From Bunza the Sokoto River is blocked by swamps to Argungu, whence there is a clear channel to Sokoto. After clearing operations carried out by natives a trading canoe reached Sokoto at the end of February, 1904. The section, Ambrusa to Argungu, appears to be better than the section below Ambrusa, where the depth of channel was stated in July, 1905, to be insufficient for a Nupe canoe (the largest size used) although the grass had been cleared throughout Gando and Argungu. It was thought, however, that during September and October, the height of the flood season, the work done would allow canoes up to Sokoto. I am informed that at the height of the dry season the Sokoto River can be crossed dry shod near Birnin Kebbi. It seems evident that the best that could be hoped for as a result of a moderate expenditure is a channel to Sokoto suitable for steam vessels of the ‘Swan’ type for not exceeding six months in the year. Clearing the snags would apparently afford a channel for steam canoes up to Jega for at least six months in the year, but this point has not been verified. It has also been suggested by Major Burdon that clearing the channel would restore to the land its natural drainage system, and help to counteract the advance of the desert.

9. Shada River. — As it was understood that the Shada River is navigable for a considerable distance, enquiries were made, from which it appears that canoes can proceed up this river for about six hours, when they arrive at a ‘kurimi’ (for-
est swamp) blocked with snags, which prevent further progress even at high water. The river is not used at all by traders.

The rivers Sota and Alibori, in Dahomey, are navigable for several miles at high water, but, I am given to understand, not to any useful extent.

Notes on the Trade of Sokoto, Borgu, and Kontagora Provinces.

10. From old caravan toll receipts at Ilesha and Ilo Mr. Dwyer estimates that the trade then passing through from Sokoto to the coast amounted to £52,800 per annum, excluding salt, sylvan produce, and food-stuffs.

The ‘down’ trade taxed consisted chiefly of live-stock, leather work, native hats, and mats. The ‘up’ trade was chiefly kolas, cloth, with a few sundries, such as perfumes, looking glasses, beads, &c. Salt was an important item of the ‘up’ trade. Mr. Dwyer considers that greater transport facilities would enormously develop this trade, and in addition that sylvan5 products, more particularly shea nuts and shea butter, would be exported, and that large quantities of cotton would be obtained from the Kontagora Province. Mr. Gowers, Resident, Sokoto, states that the population which would benefit by improved transport facilities between Sokoto and the Lower Niger would be not less than 1,000,000. Mr. Birtwistle, Commercial Intelligence Officer, Southern Nigeria, reported in April, 1907, that he considered a large increase in trade would soon be seen from Borgu and Kontagora with cheap transport. He stated that the main wealth of Sokoto lies in the raising of cattle, which helps to supply the Lagos and Southern Nigerian markets.

11. Present External Trade. – From the above and from my own enquiries the existing external trade of these provinces appears to be as follows:–

(a) Riverain Kontagora.

Down. – Cattle to Ilorin and Lagos. Not in very large quantities.

Shea butter. This is prepared by the women for sale to the Niger Company from villages up to about Momaji. It used to be sent down to Jebba, but in future a good deal of it will go to the new Niger Company’s station at Leaba, where the nearer villages already bring in quantities of shea nuts as well as butter.

Up. – Cloth, salt, kolas, and the usual sundries.

(b) Sokoto, with Lagos and Southern Nigerian markets.

Down. – Cattle, sheep and goats, potash, skins and leather work, hats, onions and onion leaves.

Up. – Cloth, kolas, salt, cigarettes, sugar, matches, beads, and other sundries, and certain native food-stuffs which appear to grow only near the coast (kimber, yaji, &c.).
With the Gold Coast (Salaga).
Down. – Potash, skins, onions and onion leaves, and a little native salt.
Up. – Kolas.
Down. – Potash, skins, and a few cattle.
Up. – Kolas and a little salt. I was informed that imported salt was practically all obtained at Lagos.

(c) Territoire Militaire.
Down. – Cattle to Lagos and Ilorin.
Up. – Cloth and kolas. It appears that the road to Cotonou is much infested with tsetse, a disadvantage which will be overcome by the extension of the Dahomey Railway.
In all the above cases cattle are taken down from starting point to destination by the same man, and do not change hands at intermediate markets.

As regards development under improved conditions of transport.

12. Cattle. – The stimulus of trade and increased prosperity of the country is bound to increase the local demand as well as the demand on the coast. It is not likely that the cattle trade as now organised will be carried on by a mixed system of road and rail transport, or road, water, and rail transport, unless the road journey involves heavy fatalities (about which I could obtain no reliable information), or unless the rail transport brings the animals into the market in such an improved condition as to realise a higher price towards covering the freight. These conditions might easily operate during the rainy season and, possibly, throughout the year. It is possible, however, that native, or even European traders from the coast, with capital, may endeavour to carry on a trade in cattle on a larger scale, and to such a quicker turnover would be of importance, while the fact of handling large consignments in full truckloads, and eventually trainloads, would justify low railway rates. In this case the cattle trade might afford a valuable contribution to the revenue of any transport undertaking. It is worth going a step further and enquiring into the possibility of developing an export trade in cattle to other west coast markets or to England. Any such development would probably be best effected by one of the large firms dealing with the cattle and meat trade in other parts of the world, as, in their case, it would not be necessary to irretrievably embark so much capital in a new venture. As a preliminary measure the Administration would be asked to furnish fairly reliable figures as to the number of cattle in the country, with the annual output of saleable oxen likely to be available. From information in past official reports there would appear to be at least 600,000 to 800,000 cattle in Northern Nigeria, more probably from 1 to 1 1/2 millions, with an annual recorded export to the coast of some 15,000
head; according to a French official estimate the number of cattle in the Territoire Militaire du Niger is 250,000. Enquiries would also doubtless be made as to whether the country has been subjected to ravages, like the rinderpest in South Africa, which might diminish the supply and prospective increase. Steps would also have to be taken to improve the quality of the cattle, and, in view of the great importance of this question, it would appear advisable, if not already done, to obtain and act on expert advice as to the best method of carrying this out. Even now it is possible that the low price of cattle – 35s. for the largest size animal at Kano, and about £3 between Yelwa and Ilo – and the large existing and prospective markets may disclose a margin of profit sufficient to encourage an endeavour to start and develop this trade on a large scale. For the frozen meat trade, it is understood that the usual practice is to slaughter the cattle as near as possible to the point of shipment, but the possibility of establishing refrigerators up-country and sending the meat down in cold storage vehicles should be borne in mind. It is not impossible that a start would be made with tinned instead of frozen meat in view of the smaller capital outlay. In any case, however, a proportion of live cattle will always be required to supply the Mohammedan market. I regret I have not sufficient data on this point to hazard a guess as to whether there is any chance of competing with the other existing sources of supply. Among these may be mentioned the extensive trade in jerked beef between Argentine and Lagos and other west coast markets. The above suggestions, which apply to Kano as well as to Sokoto, are submitted as a basis for enquiry. Large herds of cattle were passed on nearly every sand-bank between Yelwa and Gaya. It appears that they are herded on these banks during the dry season and driven daily to the dried-up swamps to feed. Every sand-bank is covered with cow dung, which would afford valuable manure and could easily be collected by canoe, but which is allowed to be washed away every year by the river, at high water. / 

13. Sheep and Goats. – It is doubtful whether the sheep of Northern Nigeria are large enough for export, but there is a heavy demand for them on the coast, and if carried in bulk the traffic is likely to be more remunerative to a railway than the carriage of cattle.

14. Skins. The increased local consumption of meat, already noticeable in the Kano Province, and the extinction of the desert trade will doubtless effect an appreciable increase in the quantity of skins available for export, and it should be possible, with improved transport facilities, to divert the trade with the Gold Coast via Lagos and Sekondi. There is an unlimited demand in the European and American markets for hides and skins, on the general question of which it is hoped to shortly submit a separate report. The construction of the Baro-Kano Railway has already resulted in an ever-increasing trade in raw hides.

15. Potash. – This will doubtless be sent down by the improved communications, and the trade, which is a local one with Southern Nigeria, is likely to
increase. The overland potash trade with the Gold Coast will follow the route to which the kolas are attracted.

16. **Shea.** – Shea trees are very plentiful between Jebba and Yelwa. Mr. Dwyer states they abound all over Kontagora. Beyond Yelwa I was informed everywhere that there were many shea trees, except close along the banks of the river, and that this rich belt extended into French territory. Shea butter is made everywhere for local requirements, and I frequently saw the nuts laid out to dry prior to decortication. There was, however, absolute unanimity in reporting a very bad season this year in riverain Kontagora, Borgu, and Sokoto. Near Ibo I was informed that this was the third bad year in succession. In Kontagora and Sokoto last year was a good season. It may be mentioned that last year was a bad season for shea along the Baro-Kano Railway, whereas this year is believed to be a particularly good one. Enquiries in Borgu and Sokoto provinces elicited the unanimous information that the shea flowers were destroyed by a large fly, called ‘Kurungu’ at Ilo, or ‘Besunu’ at Kiende, and which is about as large as a locust, black in colour, and feeds by night. At Kiende I was informed that these insects arrived in large numbers from the direction of Yelwa, and appeared to be migrating. The visitation lasts about one month, and presumably takes place about January, when the shea is in flower. It was expressly stated that the fly is not the same as the white fly – presumably the locust – which sometimes arrives in clouds, and eats the corn, but which they had not seen for several years. At Kiende I was informed that this year was the first time for six years that the shea had been attacked by fly, but at Ilo and Sabongari it was stated that the fly was the cause of the three bad seasons. Anything which affects the output of shea is of the highest importance to Northern Nigeria, and it is suggested that specimens of the insect referred to above should be collected next season for submission to experts. In a good or average year the quantity of shea available for exportation will constitute an important source of revenue to any scheme for improving communications. The price of shea butter in Yelwa market varies from 1d. to 1 1/2d. per lb., and of shea nuts from 1/5th to 2/5ths of 1d. per lb. Shea butter fetches about the same price as palm oil on the European markets (£28 to £32 at the present time). The shea nuts now exported are mostly disposed of privately on the Continent, and the present low official price of £10 to £11 10s. per ton will improve when a regular supply comes on the open market.

17. **Cotton.** – Mr. Dwyer described in his report how an attempt to develop the cotton trade by establishing markets at Yelwa and Warra failed solely through lack of cheap transport. Resident, Yelwa, states that with improved transport he considers that cotton would be the staple export from the north of Kontagora. The price in Yelwa market varies from .625 to 1.25 pence per lb., the price on the 5th August being .8 pence per lb. At Gomba 5 1/2 lbs. of Borgu cotton from Kaoge market was bought for 6d., and I was told the price was unusually high.
This cotton is grown round Kalli and Bani, and the whole of the quantity now produced is sold in the local markets. I was unable to obtain particulars during my brief visit regarding the area likely to be available for the cultivation of cotton in Borgu and Sokoto. Small samples of Kontagora, Sokoto, and Borgu cotton were brought down and submitted to the British Cotton Growing Association, copies of whose reports are attached (Annexure 2). It therefore appears that cotton is already profitably grown at a price of less than the 1d. per lb. which the British Cotton Growing Association offer at their buying stations, and this is a more favourable state of affairs than in Kano and Zaria, where the British Cotton Growing Association were faced by a far higher ruling price. / 

_Ground-nuts_ are not largely grown in the neighbourhood of the river, but would probably flourish wherever the shea tree is found.

18. _Gum and beeswax_—Gum is reported in large quantities all over Borgu. It is not known whether the trees are plentiful in Sokoto, though this appears probable in view of the expected importance of the commodity along the Baro-Kano Railway in Kano and Zaria Provinces. The constant demand in European markets and the high prices obtainable are bound to develop the trade in beeswax in any part of Northern Nigeria where transport facilities are available.

19. _Capsicums and peppers_ would doubtless find an outlet on a smaller scale. They are to be seen in every local market.

As regards imports:—

20. _Kolas_.—Apart from the increase in this trade, which is bound to result from cheaper transport, it seems highly probable that the large caravans proceeding direct from Ilo to Salaga, in the Gold Coast, a journey of at least 50 days each way, will be diverted either via Lagos or via Cotonou.

21. _Salt_.—Native salt is produced all along the Dallum Mauri, bordering the western frontier of Northern Nigeria, north of the Niger. It is turned out in double-ended cones about two feet long and four inches diameter, or else sold in small baskets varying in size down to one foot long and 1 1/2 inches diameter. This salt was met with as far south as Yelwa, though imported salt is chiefly sold at the latter place. It is found in all the markets along the river nearer the frontier, but is not taken south in large quantities. A statement of the market price of this salt at the principal centres in the Sokoto Province will be necessary before estimating its possible displacement by imported salt. The latter could be delivered at Jega by rail from Lagos at approximately the following cost per ton:—

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (in English)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost in England</td>
<td>£2 0 0</td>
</tr>
<tr>
<td>Freight</td>
<td>1 0 0</td>
</tr>
<tr>
<td>Duty</td>
<td>2 0 0</td>
</tr>
<tr>
<td>Railway</td>
<td>4 0 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>£9 0 0</strong></td>
</tr>
</tbody>
</table>

At equal prices the European salt is preferred.
22. **Imported cotton goods.** – This, in the absence of gin, will always remain the most important item. Its extent will be governed primarily by the development of the export trade, and to a far lesser extent by the ability of imported cotton goods to compete with the native product. European firms have not yet been able to produce an article of equal quality and durability as the native cloth at the same price, consequently the native cloth industry is in no immediate danger, and may even receive an impetus with increased prosperity. It is not impossible that there may be a demand in Europe for certain lines.

23. **Miscellaneous.** – Sugar, and articles such as cigarettes, matches, beads, looking glasses, &c., would doubtless share the general advance. Corrugated iron and kerosene already find a ready sale in Southern Nigeria, and doubtless with improved communications the market would be extended to Northern Nigeria.

Attached is a copy of a list prepared by Resident, Yelwa, showing the prices prevailing in Yelwa market. (Annexure 3.)

24. **Coinage.** – At Giri, and also at other places visited by me along the river, the subsidiary coinage, and especially the tenths, has not yet attained the same popularity as in the Nupe, Zaria, and Kano Provinces, but no difficulty was met with. The rate of exchange appears to be 2,000 cowries to the shilling.

**Trade routes.**

25. The routes followed by the existing trade are of importance. It is sufficient to consider the more important routes from Sokoto Province to Lagos, Salaga (Gold Coast) and Cotonou (Dahomey). They all appear to converge at Jega, five days by road from Sokoto [...].

26. **Routes to and from Lagos.** – (a) Via Kaura Aliwanta, Giro, Kwaiifa, across the River Gulbin Ka, Cherubi Kongwai, *Kiende*, Marati, Besse, across the River Gia, Zuguntenne, Shanga, Gangwo, across the River Dan Zaki, Sowashi, Funfundeji, across the River Kundu, Tandi, Yelwa, Likofe, N’Gashki, and so towards Jebba. During the dry season the road followed varies as below:–

Besse, Boma, across Gulbin Gia, Gonangwanda, Dugaraha, across the River Dan Zaki, Tsafonderu (Dugutufo), Funundeji. /

In the height of the rains the road sometimes followed goes via Sowashi, Bakin Toro, across River Kundu, Gulungu, Tungan Bawa, Tandi.

The road from Kwaiita to Kiende is said to be swampy in the height of the rains, but is passable all the year round, – cattle being swum across where necessary.

(b) A comparatively small number of traders, mostly dealing in imported salt, which practically all comes via Jebba, use the river all or part of the way from Jebba to Jega during high water. It takes three days to go by road from Kiende to Jega, and thirteen days by canoe. The river above Sekachi is used for local trade in native salt, calabashes, and fish.
(c) Jega, via Kaura Alikanta, Kiende, Lela, Tuga, across the Niger to Gendenni, Kaoge, Konkwesso, Yangbassa (also called Yerima Gwazo), Masaka, Dekala (also called Karofi), across the River Gulbin Darina (called Oli in 1909 [...]), Giddan Doruma, Bote, Yashikira, Guri, Sua, Borai, Okuta (also called Duchì), Ilesha, Dan Sani Meja (Mojo?), Shaki, Iseyin, Abeokuta, Lagos. Time taken Gendenni to Lagos about 35 days.

There is an alternative less important road via Kaiama. Traders by these roads do not use the Sokoto River. The cattle are swum across the River Niger at Gendenni. The trade by this route is chiefly cattle and sheep, the return loads containing cloth and kolas. Further particulars were not available, as the Sokoto traders do not undo their loads at Gendenni.

From Kiende to Tuga is very swampy in the rains, but the road is used all the year round. Traders state that from Tuga to Tungan Gado the swamps are up to one foot in depth in the dry season, and up to five feet deep in the rains; that there are frequent swamps between Tungan Gado and Lela; that between Lela and Ruan Duchi there is one large swamp accessible by canoes in the rains, and between Ruan Duchi and Kiende there is a swamp impassable during high flood, and traders have to go a long way round via Marati. [...]

(d) A small number of traders branch off from Giro via Dakingari, Algernia, Sabongari to Ilo, or via Bunza, Kangakoe and Giri to Ilo. The Ilo market (Mondays and Fridays) is chiefly for Salaga trade and for the small Cotonou trade. Traders for Lagos proceeding via Ilo follow the road Kalli, Samia, then into French territory to Daku, Segbana, Kankali, Kiouré, Naganzi (also called Giddan Lalli) then back again into Nigeria to Yangbassa (also called Yerima Gwazo) and thence as per '(c).' It takes about 37 days from Ilo to Lagos.

27. At Giri, the river port of Ilo (which is four miles from the river) for traffic from the Kangakoe District and for Salaga, there is a swamp between the river and the village. For some fifty yards it is about three feet deep at low water. No effort is made to provide a canoe, and everybody seems to take it as a matter of course to walk through the water, which, on August 1st, was up to the chins of the women who went to sell food to the canoemen. A bank two feet high and about 100 yards long through the shallow part of the swamp, and a canoe at the deep place would seem worth while arranging for in view of the inevitable growing competition of Gaya as a market. At high water canoes can go up the Iloguru River and over the swamp to firm ground at Giri. Ilo is a Customs station in charge of a native clerk, who, however, had gone away with the Resident a few days before my arrival.

28. Mr. Dwyer reports ‘the original trade route between Lagos and Jega markets was Bahindi, Yelwa, N’Gashki and Warra. At Warra the caravans would split up and some go south via Auna, while others crossed the river and went to Lagos territory via Bussa, Wawa, Kaiama, and Ilesha. The road, Bahindi to
Yelwa, was made impracticable by the attacks which Serikin Faiki and Serikin Keli made on caravans, and also to a small extent by the attacks of Kontagora and Legau. If the traders escaped one they usually fell into the hands of the other. By degrees the traders began to cross the river to Sabongari, and go to Lagos via Kaoge, Yangbassa, Kaiama, and Ilesha. This road was changed by the action of the Officer Commanding Troops, Yashikira, before the Government of Northern Nigeria was formed. The Officer Commanding diverted the traders to the road Yangbassa, Yashikira, Boria, Okuta, Ilesha.'

There seems no doubt from all enquiries that large as the present trade via Yelwa is, a greater quantity still goes down along the Dahomey frontier by route c, i.e., via Tuga, Gendenni, Kaoge, Yashikira.

29. Trade Road to Cotonou and also to Salaga. – Owing to tsetse very little trade from Sokoto appears to go to Cotonou, and most of the cattle and sheep from the north of Dahomey and from the Territoire Militaire appear to go at present to the Southern Nigerian markets. Owing to there being two important places called Zugu (French, Zougou), and also Kandi (French, Kouande), and also because the local names differ from the names given to places by traders (see Route (c) above), it is not easy to follow the routes described by traders. With the assistance of the latest French map, it is evident that the road to Salaga goes through the eastern Kandi and on via the western Zugu. The following is the wet season road to Kandi from Ilo:— Ilo, Madekali, Garu, Monkassa, Kuberi (Goubéri), Faiki (Férékire), Guéné, Gungun (Goungoun), Chefu, Tioka, Touy, Peredi, Gala, Kandi. In the dry season there is a direct road from Ilo via Bani, Gulubi, Janrua, Koncheraga, to Kandi. This road is said to be rendered impassable in the rains by continuous swamps and one big river.

After passing Kandi traders for the Gold Coast proceed as follows:— Giddan Magigia, Bagou, Irira Gandu(?), Sinendé, Baku, Makuru, Kua, Zougou, Dan Zougou, Yendi (Togoland), Kobia, Salaga (also called Gonda or Gwonga(?)), and also to markets at Yagi and Parre, both in the Gold Coast. It takes fifty days from Ilo to Salaga, and seven days on to Chibabo (?) (untraceable on maps) where the kolas are said to grow. Some of the traders go on to Coomassie. There is evidently a large trade done by this route, and it is an important question whether it can be diverted to British channels of communication.

There is a more direct road [...] from Jega to Salaga via Bunza, Fingila, Dolé, or Gaya. It is understood that in the dry season there is a shortage of water along this route, the importance of which will be again referred to.

Information bearing on possible French trade competition.

30. The Dahomey Railway is open for traffic to Savé, 260 kilometres (162 miles) from the port of Cotonou, and from this point there has recently been constructed a good motor road to Guéné and thence to Karimama with a branch to Gaya. Two important bridges over the Sota and Alibori rivers and several
minor bridges and culverts are said to be solely constructed out of local material. The distance from Savé to Karimama is 510 kilometres – 320 miles. The distance from Savé to Gaya is about 300 miles, making about 465 miles Cotonou to Gaya. At present it takes twenty days to trek from Savé to Gaya. Carriers on this section cost one franc per day’s march on the outward journey and twenty centimes per day for the return journey light.

31. Since his recent tour through French Guinea, Haut-Sénégal-et-Niger, Dahomey, and the Ivory Coast, M. Ponty, Governor-General of French West Africa, has foreshadowed a comprehensive scheme for linking up the Colonies of French West Africa by a system of railways, the completion of which is estimated to cost 480,000,000 francs in addition to expenditure already authorised. [...] A loan of 150,000,000 francs is to be raised forthwith and will be devoted to completing the sections shown in red. From the above it will be seen: Firstly, that there will eventually be a line from Cotonou to Koki, or rather to the right bank of the River Niger at a point two miles north of Gaya and which will be referred to as Gaya in this report. Secondly, that the extension of the Dahomey Railway from Savé to Paraku, mile 274, is to be undertaken shortly, leaving about 190 miles of comparatively easy country to complete to Gaya. It is proposed to provide for diverting funds from one railway to another at the discretion of the Governor-General, in which case there is nothing to prevent the Dahomey Railway being completed to the Niger out of the forthcoming loan.

32. [...] Other things being equal, a railway to Paraku might tap the whole of the trade going down the western road, possibly diverting it from Dekala via Nikki and Pérééré to Paraku, and may quite likely capture the trade of the portion of Borgu between Ilesha and Yashikira. Already an effort seems to have been made in this latter respect. The principal external trade of this district consists of shea butter, exported, and salt, imported. This trade used to be centred at the markets of Gbassero [...] and, secondly, Boria. A market has now been started at Agua in Dahomey just over the border, and it is reported that traders from Ilorin and Lagos instead of exchanging their salt for shea butter at Gbassero and Boria are now doing so at Agua, from which place there is said to be a good road to Paraku. It is reported that about a year ago the French started to enforce an import duty on salt arriving from Lagos or Ilorin. It is stated that this duty is not collected from Borgu traders, natives saying ‘Because the Borgu people and the Nikki people are of the same / blood.’ It may, however, be that Borgu traders deal more particularly in local salt from the vicinity of Tunuga in French territory. The French duty on salt imported from Cotonou is 15 francs per ton, as compared with £1 per ton into Southern Nigeria with a further £1 on entering Northern Nigeria, and any extra duty on the frontier will tend to divert the trade via the Dahomey railway to Cotonou firms. Natives report the amount of the duty collected on the frontier to be one shilling per cwt., but, in view of the
Convention of June, 1898, it is not likely that the amount exceeds 15 francs per ton unless the import duty at Cotonou has been recently raised.

The French have Customs stations under European supervision at Paraku, Nikki, and Zugu, of which Nikki is the principal one. They have also a European Customs officer, assisted by police, to look after the frontier. As the salt referred to above is caught while in bulk, it is not difficult for the duty to be collected. On the other hand, we have only had a native Customs clerk at Ilesha, who can only be inspected at rate intervals by the Resident from Bussa, and a new Customs post is being started at Yashikira (vide the ‘Northern Nigeria Government Gazette,’ of May 31st). If the markets are transferred to Dahomey the salt will be brought back in small quantities to the villages direct, and it will be almost impossible to collect duty on it. Apart from the question of duty, it is now as cheap to send salt to the above markets via Cotonou and Savé as via Lagos, and when the Dahomey Railway reaches Paraku it is difficult to see how Lagos can compete unless a branch line is built from Abeokuta to Ilesha. It should be mentioned, however, that the import of salt into Dahomey fell from 4,000 tons in 1909 to 3,300 tons in 1910, figures which point to the strong position hitherto held by Lagos merchants in this trade. The imports of salt into Lagos were 6,969 tons in 1909 and 7,841 tons in 1910.

33. As regards the through trade from Sokoto, a remedy appears to exist, namely, to use all the influence possible to divert this trade to the Jedba route. The latter road is already a good one and largely used. Facilities for traders could, doubtless, easily be expanded to meet the increased traffic. A few additional markets for food and slight improvements to drifts and arrangements for crossing the principal rivers would assist in popularising this route. It would, doubtless, take time to effect a substantial change, and it is therefore important that the necessary steps should be taken without delay. It is observed that the success of this policy would lessen the importance of the strip of Borgu along the western frontier, which at present subsists largely on the through caravan trade.

34. The present French policy is to utilise the Dahomey Railway for officials and stores proceeding to Zinder instead of the route via Dakar and Timbuctoo, which had hitherto been chiefly employed. So long as the headquarters of the Territoire Militaire was at Niamey, traffic via Dahomey used to proceed to that place en route, but now the headquarters have been transferred to Zinder the Territoire Militaire will take over the transport at Gaya, thus effecting a substantial reduction of the distance. The Resident at Karimama is being withdrawn and transferred to Guéné, situated on the motor road to Gaya. Rest-houses have recently been built at Gaya, which is the headquarters of a lieutenant commanding a Secteur of the Niamey Cercle of the Territoire Militaire. Captain Lenfant mentions in his book that there is insufficient water along the road from Gaya to
Chad, but from the above information it appears evident that this difficulty has since been overcome.

35. In the report of the 20th June, 1911, on my mission to Zinder, the relative cost of transport to Zinder by the different routes was gone into and a copy of the tabulated results is attached to this report (Annexure 4). It will be seen that there is at present a large saving in the cost of transporting goods and in the time taken by officials if they go via the Kano route. After the Dahomey Railway reaches the Niger, the saving, though still large, is much reduced, and the Administration of French West Africa may be tempted to face the extra expense in order to keep the traffic in French territory. Should they decide on this, they will doubtless use every means to make the railway pay by tapping every possible source of traffic; and though, by the Convention of June, 1898, the French cannot differentiate against foreign goods in their Dahomey Customs tariff, there is believed to be no such restriction in the case of the Territoire Militaire or the Northern part of Dahomey [...], and in either Colony it might be advanced that Article IX. of the Convention admits of a surtax on indirect importations, i.e., other than through a French Colony, similar to the surtax applying to French Guinea, so long as foreign goods are not discriminated against (see Zinder report).

36. A vigorous policy now, on our part, to the end of retaining the Sokoto and Borgu traffic, may tend to damp anticipations of capturing a large proportion of it for the Dahomey Railway and indirectly influence the French Administration in favour of the Kano route of access to the Territoire Militaire du Niger and also the northern part of the Territoire Militaire du Chad. The latter policy has many advocates among French officials, and it is hardly necessary to refer to the advantage which would accrue to the British Administration. When the Dahomey Railway reaches the Niger at Gaya, there is nothing to prevent the French Government starting a river marine to work between Kompa and Sekachi, and unless steps are taken to anticipate this development the Lagos merchants will find it hard to retain a share in the export and import trade of the north-west Provinces of Northern Nigeria, which will find their economic outlet through Dahomey.

Summary of Important Data.

37. From the preceding details, it is submitted that the salient points affecting our transport policy to develop the north-west provinces of Northern Nigeria are as follows:

38. The River Niger is unnavigable for steam vessels of any kind between Jebba and Sekachi.

39. The River Niger is navigable for steam vessels from Sekachi to Kompa. A minimum draft of 18 inches is available from Sekachi to Gaya at dead low
water, and vessels of four feet draft could run for the greater part of the year. That is to say, a railway terminus at Sekachi or Gaya would be served by at least 120 miles of excellent waterway which practically intersects every trade route from the Sokoto province to the coast and to the Ashanti (Gold Coast) markets.

40. The Sokoto River is open to Bunza and thence the Gulbin Gindi is practicable to Jega for small canoes all the year round and for large canoes from July to February. Navigation on this river could probably be improved.

41. The principal existing export trade is live stock, after which comes potash, after which, again, skins. The principal imports are kolas, cloth, and salt. Improved communications would not only develop this trade but open up a large shea-bearing area to exploitation and also a trade in gum and possibly ground-nuts and beeswax. Cotton is freely grown in Kontagora, Borgu, and Sokoto. It is sold in Yelwa market at prices ranging from .625 pence to 1.25 pence per lb., according to season. Samples purchased during my tour have been not unfavourably reported on. These figures compare very favourably with the prices ruling in Zaria and Kano. With improved communications a large production from Kontagora province is anticipated.

42. Although a large number of traders use the Jebba route, the greater part of the Sokoto trade goes to Lagos by a road which closely follows the Dahomey frontier. The French are beginning to draw the local trade over the border near Okuta by establishing markets and taxing salt from Lagos, and they will doubtless make a bid for the through traffic when the railway reaches Paraku (mile 274 from Cotonou), to which place it is proposed to extend it at an early date from Savé, mile 162. Eventually the Dahomey Railway will be extended to Gaya, 465 miles from Cotonou and 25 miles from our western frontier, and the French can then start a river service on the Niger, extending from Kompa to Sekachi. Unless countervailing action is taken by the Administration of Northern Nigeria the above service will be the easiest outlet to the coast from Sokoto, Borgu, and the north of Kontagora, and not only would a large quantity of trade be lost by British firms and traffic by Nigerian railways, including possibly traffic now going overland to the Gold Coast, but, indirectly, the chances of the French Government using the Kano route to their Territoires Militaires will be greatly lessened.

Recommendations.

43. In view of the above facts, the following recommendations are submitted. The general scheme proposed divides itself into two stages. Firstly, the construction with the least possible delay of a 3 feet 6 inch line on the Baro Kano Railway standard from Jebba, or a point near Jebba, to Sekachi on the left bank of the Niger. The direct distance is about 125 miles, and a railway would probably be about 140 miles long. Without this link the commercial development of
Sokoto is impossible except via the French Railway, when it is completed to the Niger. With the additional advantage of being served by extensive waterways, it would be a great stimulus to trade, and we would at once be on practically even terms with the facilities which could eventually be offered by the Dahomey Railway, and if action is taken without delay British firms should have secured the bulk of the trade before the Dahomey Railway reaches the Niger.

44. An alternative line of approximately equal length could be constructed to Sokoto, starting from the vicinity of Akerri. This line might be somewhat less expensive to construct, and at first sight offers attractions, in that it would pass Kontagora town, that it would be more convenient for internal movements in Northern Nigeria, and that it would enable part of the traffic to be worked via Baro, but the paramount consideration is that the proposed railway is a competitive route to the coast. Akerri is equidistant from Lagos and Burutu from a transport point of view, i.e., it would cost about the same to work the traffic either way. By making Jebba the starting point, a saving of about 110 miles of railway journey is effected. Even then the distance by rail from Lagos to Sekachi will be about 450 miles, as compared with 465 miles, Cotonou to Gaya, and the latter place is nearer the Sokoto markets, so that any extra mileage by the Jebba route would seriously affect the prospects of the line. Moreover, Jebba is a good port, open to steamers drawing 5 feet during about six months in the year, and offering an alternative route to the coast during this period which it might pay firms owning river steamers to use.

45. It is possible that the question of diverting Kano and Zaria traffic from its natural route, via Baro, may be met by giving the Lagos Railway an independent sphere of development in Northern Nigeria.

46. As regards the chances of the proposed line paying, there is no doubt in my mind that it would pay its way within five years of the completion of construction, probably within three or four years, and should there be any chance of one of the large meat firms exploiting the cattle and sheep trade, the prospects of the line would be correspondingly improved.

47. A service of tugs and barges should be started as soon as the railway reaches Sekachi. If this is not done, and native canoe traffic is relied on to feed the railway, not only will the development of trade be retarded, but the French Railway, on arrival at Gaya, might secure the trade by establishing a river service. It is worth noting that, under the Convention of 1898, the French may apparently claim the right to discriminate against British shipping on the Niger above our western frontier. It is presumed, however, that the Act of Berlin, 26 February, 1885, Articles 26 to 33, will safeguard us in this respect.

48. It will be seen [...] that the distance by road or water from the Sokoto markets to a British railway terminus at Sekachi and the proposed French one at Gaya are for all purposes practically the same, except in the case of the short
Transport Policy to Develop the Northern Provinces of Northern Nigeria

road from Jega via Bunza and Fingila to Gaya. This difference is not regarded as a serious one in the face of official encouragement of the other route and the position already enjoyed by British trade, but it will be worthwhile going into the question of water service up the Sokoto River as far as Bunza, in case it is found advantageous to try and intercept traffic at this point.

49. The second part of the scheme recommended is the eventual extension of the railway to Sokoto via Jega. The Sokoto River is quite insufficient as the sole alternative to road transport for the commercial development of the most densely populated portion of Sokoto Province, though it will be a useful feeder to the railway.

50. Quite apart from the French competition, it is considered that the scheme proposed is best calculated to develop the resources of the north-west provinces of Northern Nigeria, and that the country is ripe for it.

51. As a preliminary measure, it is most important to use the influence of Residents to divert the Sokoto traffic from following the road along the Dahomey frontier to the Yelwa-Jebba road, which it used to follow in the old days.

52. It is also recommended that a marine officer should visit the Niger between Sekachi and the frontier at dead low water, when he could ascertain definitely the minimum depth of channel on this section and carry out any necessary removal of snags and rocks with a small party in one season. He could, at the same time, report on the Sokoto River to Bunza and the Gulbin Gindi to Jega, and possibly make a start in removing snags on these rivers. A steel canoe might with advantage be allotted to Residents of Sokoto to facilitate the survey, clearing, and improvement of the navigation of the Sokoto River. /

[...] Engineering considerations affecting the First Section of the proposed Railway from Jebba to Sekachi. [...]

63. The obstacles to be surmounted or avoided are as follows:–

The hills between Jebba and Biaggi, known as the Washington Mountains.
The River Kudda at Biaggi.
The hills between the Niger and the trade road from Karoji to Mykera.
The River Mainyaro, an important tributary of the Kontagora River, running past Shaffini.
The hill between Shaffini and Momaji separating the basins of the Mainyaro and Kontagora Rivers.
The River Kontagora.
The high country in the vicinity of N’Gashki.
The River Wata (comparatively small).
The River Molendo.
The River Bambirri, north of Tandi (comparatively small).
The River Kundu and the swamps on the left bank of the Niger at Sekachi.

64. [...] With the possible exception of the River Kundu all the founds are likely to be on rock or in firm sand, and do not appear to offer any difficulties. There were outcrops of rock in several places along the road followed by me, but I consider there would be no difficulty in locating a railway to avoid heavy rock cutting.

65. Time did not permit of anything like a proper railway reconnaissance being attempted, but from what I saw of the country the most likely lines for further investigation would appear to be as follows:–

(a) Starting from Tatabu, on the Lagos extension, strike the Kudda River somewhere near Karo, and follow the valley of the Kia River to its source. Then it would possibly be best to strike west of Shaffini, skirt the western slopes of the high ground between Shaffini and Momaji, crossing the Kontagora River near the latter place so as to take advantage of the valley followed by the road to Makwari.

(b) As regards the N’Gashki hills, the small river at Mafungi proceeds for some distance in a northerly direction along an open flat valley, and there may be an easy summit between this stream and the valley of the Wata. This part of the route would require little or no bridging. On the other hand, it would be preferable from a commercial point of view for the railway to pass west of N’Gashki, and thus better serve this place and the important market of Warra.

(c) After crossing the Wata, a river hardly as big as the Bakogi River on the Baro-Kano Railway, it would be necessary to choose the best crossing over the Molendo, from which river the line should deflect towards the River Niger and follow it to Yelwa. An easy crossing with rock founds over the Bambirri River can be found a few hundred yards from its mouth. The approaches to the river at Sekachi will be dealt with below.

66. As alternatives to this route the line might start from Jebba and follow the stream up to the col at Kylema, thence west of Giddan Salu to Biaggi. From Biaggi, instead of following the valleys of the Kudda and Kia, the line might skirt the southern and western slopes of the high ground north-west of Biaggi till it reaches Leaba, and then skirting the Niger from Leaba to Wuru rejoin the first line north of Mykera.

67. It may be thought worth while investigating a line closely following the Niger for the greater part of the distance. Such a line might be possible, but it is feared the bridging would be heavy, and though from the reports received a fairly easy way round the Washington Mountains and hills south of Leaba seems not unlikely, there might be difficulties at Kijonji [...] and the rocky hill
between Bussa and Libata, and the line would have to skirt the swampy ground north of Warra.

68. A disadvantage of the first route suggested would be that part of it passes through uninhabited bush, but if this should be the shortest and easiest route it is not worth building the line further west in view of the fact that the country up to Leaba can send its produce down to Jebba by river. It is far more important to serve N’Gashki, and, if possible Auna, Warra, and Bussa, as these are all fairly important places. Bin Yauri, which, in times gone by, must have been a large town, now consists of a group of unimportant villages. On the other hand, Yelwa is already an important and flourishing market.

69. [...] 

70. This proposal has taken into consideration the eventual extension of the railway towards Sokoto, which would probably skirt the rising ground which limits the swamps on the left bank of the Niger as far as the Sokoto River. In view of the importance of the proposed railway as a competing line with the Dahomey Railway it is submitted that the estimates for the construction of the first section should be based on a cost of £4,000 a mile.

H. O. Mance, Captain,
Royal Engineers.
30 November, 1911.

Annexure 2.


Dear Sir,

Lokoja, 7th September, 1911.

Your letter of date and samples cotton from the Kontagora, Borgu, and Sokoto Districts to hand.

Information as regards prices in the several localities mentioned is of interest.

The samples (3) are of one class of cotton, and judging from the small size of each particular ‘lock’ the writer considers it to be a ratooned or tree cotton, that is, the plant is allowed to grow for several years instead of the usual annual.

The sample from Kaoge is the best for colour. In all three cases the length is good, fibre silky, but rather weak.

I have referred them home with a copy of your letter, and asked our people to let you have an expert (broker’s) report.

Yours faithfully,

H. Worsley,
Manager.

Captain Mance, Royal Engineers,
Lokoja.
Dear Captain Mance, 15, Cross Street, Manchester, 4th October, 1911.

We recently received from Mr. Worsley several samples of cotton which you had handed to him for valuation purposes. We have submitted these to one of our expert brokers, and send you herewith his valuation and report upon the same.

The sample from Kiende, Sokoto, is valued at about 40 points on Middling American. The samples from Yelwa and Kontagora do not compare at all favourably with American, but go better against Indian cotton, known as broach, and would be worth to-day 5 3/4d. to 5 7/8d.

The price of American cotton being 5.31d., the Sokoto sample would be worth about 5.70d., and the other two would be worth 5.75d. to 5.87d. per lb., although, of course, owing to shortness and roughness of these two latter types, they would be of more use to the Yorkshire trade* for mixing with wool.

The valuations, however, are merely nominal, as the samples were exceedingly small, and it is almost impossible to say what would be the proper values unless one had commercial quantities to judge from.

Yours faithfully,

W. H. Himbury,
Manager.

Captain H. Mance, R.E.,
Old Woodbury,
Sandy,
Beds.

Dear Sirs,

Liverpool, 3rd October, 1911.

We have your three small samples of Northern Nigeria cotton before us.

‘Sokoto’ we make fine and a fair length, and is worth at the present moment about 40 on; the other ‘Borgu’ and ‘Kontagora’ are very short, and would have to be compared with broach, perhaps more valuable, say, about 5 3/4d. to 5 7/8d., and would be very acceptable in the Royton District. They are short in staple, but firm, and the slight stain would not matter much. It is, of course, difficult from the small size of these samples to give exact values, but these are the best we can do.

Yours faithfully,

Buchanan, Wignall & Co.

Messrs. The British Cotton Growing Association, Manchester.

* Limited demand.
Annexure 3.

**Yelwa Price List.**

Compiled by Mr. J. C. O. Clarke, Assistant Resident, Yelwa.

- Rani, Funturu = Dry season, Harmattan.
- Basara = Just before rains.
- Damana = Rains.
- Ferkon Damana = Beginning of rains.
- Agagere = Just after rains.
- Kakka = Harvest season.

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<tbody>
<tr>
<td>Cotton</td>
<td>8d. per lb.</td>
<td>1.25d. per lb.</td>
<td>Kaoge 1.2d. on 3rd August, 1911. (Price stated to be very high.)</td>
</tr>
<tr>
<td>Shea nuts (kwara, yaya n kedainya)</td>
<td>27d. per lb.</td>
<td>.36d. per lb.</td>
<td>Ferkon damana. .18d. per lb.</td>
</tr>
<tr>
<td>Shea butter (main kadai)</td>
<td>1d. per lb.</td>
<td>1.5d. per lb.</td>
<td>do. 1d. per lb. -</td>
</tr>
<tr>
<td>Skins</td>
<td>--</td>
<td>1s. each</td>
<td>6d. each According to size and quality.</td>
</tr>
<tr>
<td>Onions</td>
<td>1/10d. each.</td>
<td>Damana 1/10d. each.</td>
<td>Funturu 2 for 1/10 d. --</td>
</tr>
<tr>
<td>Tobacco</td>
<td>2.25d. per lb.</td>
<td>Damana 2.25d. per lb.</td>
<td>Basara 1.5d. per lb. --</td>
</tr>
<tr>
<td>Native Salt (jan gishiri) from Foga (Tunugs)</td>
<td>.83d. per lb.</td>
<td>Sept. 1.24d. per lb.</td>
<td>March – May. .62d. per lb. Dearest at time when Fulani give it to cattle. /</td>
</tr>
<tr>
<td>Potash (boiboi, kanwa from Zaberma)</td>
<td>1.2d. per lb.</td>
<td>Ferkon damana. 1.8d. per lb.</td>
<td>Agagere 9d. per lb. –</td>
</tr>
<tr>
<td>Pepper (berkono)</td>
<td>6d. per lb.</td>
<td>Rani 9d. per lb.</td>
<td>Damana 6d. per lb. –</td>
</tr>
<tr>
<td>Salt (Niger Co.)</td>
<td>5s. 6d. per 40 lb. bag</td>
<td>Ferkon damana. 6s. per 40 lb. bag.</td>
<td>Oct. – Feb. 3s. to 3s. 6d. ‡ per 40 lb. bag. ‡During trading season. Probably forced sale due to Niger Co. hitherto only paying for produce in trade goods instead of cash.</td>
</tr>
</tbody>
</table>

‡During trading season.
<table>
<thead>
<tr>
<th>Item描述</th>
<th>Maximum Price</th>
<th>Minimum Price</th>
<th>Remarks and additions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kola nuts (goro)</td>
<td>1/2d. each</td>
<td>.6d. each</td>
<td>Oct. – Feb.</td>
</tr>
<tr>
<td>Beans</td>
<td>.64d. per lb.</td>
<td>.6d. per lb.</td>
<td>Kaka</td>
</tr>
<tr>
<td>Locust beans (kalua dian dorawa)</td>
<td>1d. per lb.</td>
<td>1-6d. per lb.</td>
<td>Ferkon damana</td>
</tr>
<tr>
<td>Snuff</td>
<td>2/15d.</td>
<td>2/15d. per small 'batta.'</td>
<td>Basara</td>
</tr>
<tr>
<td>Hausa Hats (malafa)</td>
<td>1s.</td>
<td>1s. per lb.</td>
<td>Funturu</td>
</tr>
<tr>
<td>Locust bean cakes (dadawa)</td>
<td>2 for 1/10d.</td>
<td>Kaka</td>
<td>1 for 1/10d.</td>
</tr>
<tr>
<td>Fish</td>
<td>2d. per lb.</td>
<td>Funturu</td>
<td>4d. per lb.</td>
</tr>
<tr>
<td>Meat: Mutton</td>
<td>2d. per lb.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Tsire</td>
<td>5/10d. per piece of about 9 pieces.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Kilishi</td>
<td>5/10d. per slice.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Kwolle (galena)</td>
<td>3d. per piece about 1 lb.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Sword slings (worsted)</td>
<td>2s. 6d.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Brass dishes (from Gwonga)</td>
<td>2s. 6d. to 3s.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Karan (glass bangles)</td>
<td>1 1/2d. each (small).</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Taberma (coloured grass mats).</td>
<td>1s. 6d. to 2s.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Sulphur (in sticks)</td>
<td>3d. for about 1 inch.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Gafaka (book bag)</td>
<td>6d.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Sambatchai (sandals)</td>
<td>1s. per pair.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Brass bowls (German make)</td>
<td>1s. (small)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Sabulu (native soap)</td>
<td>5/10d. per handful</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>
Table showing relative cost of transport to Zinder by alternative routes.

N.B. – Officials are divided into classes as follows:–

1. First-class senior officials, entitled to 500 kilos. of baggage.
2. First-class junior officials, entitled to 400 kilos. of baggage.
3. Second-class non-commissioned officers, entitled to 200 kilos. of baggage.
4. Third-class European soldiers, entitled to 100 kilos. of baggage.

The figures quoted below include the above Government allowance of baggage.
Cost of camel transport taken at 60c. per ton per kilometre equals 10d. per ton mile, as stated by French officials to have been recently attained.

Saving in Cost of Transport of Goods by using Baro-Kano Railway and Marine Route, taking lowest French figures.

<table>
<thead>
<tr>
<th>Compared with</th>
<th>3rd Class</th>
<th>Clothing, spirits</th>
<th>2nd Class</th>
<th>1st Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£ per ton.</td>
<td>£ per ton.</td>
<td>£ per ton.</td>
<td>£ per ton.</td>
</tr>
<tr>
<td>Dakar Route</td>
<td>33</td>
<td>18</td>
<td>24</td>
<td>19</td>
</tr>
<tr>
<td>Present Dahomey Route</td>
<td>43</td>
<td>28</td>
<td>34</td>
<td>26</td>
</tr>
<tr>
<td>Dahomey Route when line to Niger</td>
<td>23</td>
<td>11</td>
<td>17</td>
<td>13</td>
</tr>
</tbody>
</table>

Saving in Cost of Transport of Government Passengers and Baggage if sent via Lagos.

<table>
<thead>
<tr>
<th>Compared with</th>
<th>1st Class Senior.</th>
<th>1st Class Junior.</th>
<th>2nd Class.</th>
<th>3rd Class.</th>
<th>Period for which pay saved.</th>
<th>Approximate saving pay of Capt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dakar Route</td>
<td>24</td>
<td>30</td>
<td>6</td>
<td>– 4</td>
<td>4 ½ mts.</td>
<td>162</td>
</tr>
<tr>
<td>Present Dahomey Route</td>
<td>24</td>
<td>20</td>
<td>2</td>
<td>– 6</td>
<td>2 mts.</td>
<td>72</td>
</tr>
<tr>
<td>Dahomey Route when railway through to Niger.*</td>
<td>3</td>
<td>2</td>
<td>5†</td>
<td>– 12</td>
<td>5 wks.</td>
<td>45</td>
</tr>
</tbody>
</table>

* Assuming rates in force on French West African Railways.
† 2nd Class ocean passage.
[INCORPORATED BY ROYAL CHARTER.]
Transport in Africa.
EAST AFRICA COMMISSION’S RECOMMENDATIONS.
£10,000,000 LOAN.
NEWSPAPER ARTICLES & CORRESPONDENCE. /
(Incorporated by Royal Charter.)
[...]

A PATRIOTIC LOAN.
NOT TO BENEFIT LANCASHIRE EXCLUSIVELY.

Reprinted from the 'Daily Dispatch,' Tuesday, October 20th, 1925.

Having visited the cotton fields of the world, and realising the paramount importance of transport to the almost limitless extension of our own Empire fields, I sincerely wish that on my coming tour I could with confidence tell the native growers, merchants, and all interested in cotton, that the 10 millions sterling so long spoken of was forthcoming, and that the construction of railways, the handmaiden of active development, would immediately be proceeded with.

We should then witness such a remarkable broadening of Empire cotton growing as would reassure Lancashire against the recurring fears of short American crops, and, in the process, send a thrill of activity through the engineering trades in this country and provide before the Christmas season a welcome message of hope to many thousands of our best British workmen now reduced to drawing State 'dole.'

Can it be done? Why should it not be done, and what would be the effect of doing it? Let me deal with these very pertinent questions.

Personally, I see nothing in the nation's finances which justifies a negative attitude. I am confident if the Chancellor of the Exchequer, whose great patriotism and commanding business vision are a great national asset, would devote his own personal attention to the issue nothing could stand in the way.

He will see in this scheme means – a cheap means – not only of lengthening but also of strengthening our Empire stakes. He will also launch one of the finest programmes for assisting our heavy industries at home whilst relieving unemployment. East African cotton planters are ahead of available cotton transport, and there is a grave danger that increased efforts of putting further land under cultivation may be delayed. / 

Lancashire’s cotton requirements to-day represent in hard cash 130 million pounds, but the problem goes much further than the limits of any one county. What if this money could be spent within the Empire? Lancashire would be enriched, the Empire would be enriched, and the world would benefit.

Speaking at the annual meeting of the British Cotton-Growing Association last June, Lord Derby (the President) put the issue very squarely; he pointed
out that the East Africa Commission, appointed by Mr. J. H. Thomas when Secretary of State for the Colonies, which comprised Major the Hon. W.G.A. Ormsby-Gore (Conservative) (Chairman), Major A. G. Church (Labour), and Mr. F. C. Linfield (Liberal), in a most able report laid special stress on the need for railway extensions in East Africa, and recommended a loan of £10,000,000, the first few years’ interest being guaranteed by the Government until the railways were established. He (Lord Derby) went further and urged that the loan should be made 20 millions of money, the extra 10 millions being utilised for providing similar facilities in West Africa, and that part of the money might be usefully spent in providing additional medical services to deal with disease and more technical education, which is badly wanted.

What Empire cotton-growing meant in the scheme of national economy he emphasised by reference to Uganda, where we are now threatened with a restriction policy on account of inadequate transport. Cotton there heads the list of exports, totalling 80 per cent. It has led to some £3,500,000 being distributed amongst the cotton growers, and this money has been largely spent in the purchase of European goods, upon which the local Government has received an import duty. The Excise duty on cotton collected by the Uganda Government last year amounted to over £158,614.

Cotton interests by themselves are big enough to justify such a loan, but there are considerations much more immense. Because of their great natural wealth, our Empire Colonies can with irrigation, harbours, railways, waterworks, roads, and lighting be made more valuable to the Empire than India. All these works must be provided by the Government. Of course the great departments of State – the Colonial Office and Foreign Office – are quite alive to the importance of the subject, and it is only the policy of economy which has been brought about since the war that has prevented greater official support. / It may be suggested that this is not the time to spend money, but any time is the right time if the expenditure can be justified, for no matter from what angle a business man approaches this question, the nation cannot embark on an outlay which will so surely repay itself.

We do not ask the Government to spend ten millions sterling, but even this could be supported if serious heed is paid to the Empire’s needs, and to the great new markets available in East and West Africa as soon as transport is provided. What is desired, and what has been promised, is that the Government should issue a loan of that amount, guaranteeing the interest for the first few years until the railways have been constructed, when they will pay for themselves. Is this proposition extravagant?

The Government responsibility would be something less than half-a-million sterling in interest for the first few years, but, on the other side of the national balance-sheet, there would be the saving effected in dole expenditure, since at
least 60 per cent. of the money would be expended in the workshops of Great Britain and returned in the form of wages in place of doles. That does not finish the matter. New markets which are badly required would open before the manufacturers of Great Britain, markets affording such enormous possibilities that one cannot believe the new loan would not be subscribed within 24 hours.

W. H. Himbury.

Reprinted from the 'Daily Dispatch,' Tuesday, October 20th, 1925.

TEN MILLIONS TO FINANCE COTTON.
WHY EAST AFRICA IS WAITING.
PLEA FOR ACTION.
GOVERNMENT OUGHT TO GRANT LOAN.

Uganda, with its great possibilities to Lancashire as a cotton-growing area, is well ahead of transport, and some authorities advise the Government to go slowly and not push development until more transport is available. /

Reports from the other centres where cotton cultivation has been encouraged – the Sudan, Tanganyika Territory, Kenya and Nyasaland – indicate that the position is also becoming increasingly serious for a great enterprise which has been carried by the highest patriotism to a point where Empire Cotton Growing should speedily place the Lancashire Textile industry in a position of independence as regards the raw material essential to the healthy life of her manufactures.

Mr. W. H. Himbury, the general manager of the British Cotton Growing Association, who, along with Mr. James M. Thomas, a member of the Council of the Association, is about to leave Manchester on a tour of the cotton fields of India and East Africa, favours us with an article in which he deals with the pressing need for action, and expresses the opinion that it would be secured if Mr. Churchill would deal with it himself instead of leaving it to the mercies of the permanent officials, who, acting under instructions of economists, are inclined to use the axe on the wrong tree.

Reprint of the correspondence supporting Mr. Himbury's article.

Mr. J. ARTHUR HUTTON, a founder and now Vice-President of the British Cotton Growing Association, writes:

In their mutual interests, capital and labour ought to join together in doing everything possible to increase our cotton supplies in new fields, and more especially within the British Empire.
Of all the fields developed under the auspices of the B.C.G.A., so far, Uganda has given the largest results, and this season’s crop will probably reach 200,000 bales of a quality eminently suitable for Lancashire’s requirements.

Unfortunately, as pointed out by Mr. Himbury, we have run up against a most serious difficulty. Unless further transport facilities are provided, it will be almost impossible to have any further development. More railways are required immediately, otherwise we shall have to stop the natives increasing their production.

It will be nothing less than a calamity if we have to tell the natives that they must not grow any more cotton because it is impossible to convey it to the market. / Here, on the one hand, we have Lancashire clamouring out for more cotton, and, on the other hand, the native farmer anxious and willing to grow it. All that is required is the connecting link – the necessary transport facilities.

WHY HESITATE?

I cannot understand how the Government can possibly hesitate for one moment in taking the steps which are necessary for the development of one of our most productive tropical possessions. They are not asked to find any capital whatever. All they are asked to do is to guarantee the interest on £10,000,000 for a few years.

Major Ormsby-Gore’s Commission was most emphatic in pressing forward the urgent need of providing these additional transport facilities in Uganda. The native farmer, if he was able to express his views, would be equally emphatic. The risk is almost infinitesimal, for it is almost impossible to construct a railway in tropical Africa which will not pay its way if properly managed.

There is also another aspect of the question. All trade means barter in the long run. Every £100 worth of cotton grown means an export of, say, £80 worth of cotton and the importation of manufactured goods in exchange. Therefore, the more we develop cotton growing the more we increase the demand for our home manufactures, and, as Mr. Himbury pointed out, the better chance there is of doing away with these dreadful ‘doles.’ Also, the duty levied on these imports will largely increase the revenue of the colony, so that the railway must pay indirectly even if the receipts only barely covered working expenses.

FOR STEEL TRADE’S SAKE.

There is also a very strong reason why there should not be one moment’s delay. The steel trade of this country is in a very bad way. The orders for the necessary rails, girders, bridges, locomotives, and rolling stock would be invaluable to the trade at the present time.

I think, therefore, that the British Cotton Growing Association, the Empire Cotton Growing Corporation, and, indeed, the whole trade of Lancashire
should not lose a single moment in pressing the Government to waste no further time and to proceed with the construction of these railways at once. / If they are not prepared to do this, will the Government please stand on one side and let somebody else do it for them? In my opinion, it is intolerable that there should be any further delay. Too much time has already been wasted. The Rt. Hon. J. R. CLYNES, M.P. states:

I have read the article by Mr. Himbury. Everything possible should be done to make the great cotton industry less dependent upon supplies grown outside the Empire.

The way in which a Government can best help is in the development of transport services. If Grants cannot be provided, Guarantees for Loans easily can, and either form of support would be a very helpful outlay indeed, more in the nature of investment than expenditure.

The construction of railways and the provision of transport facilities in a remote Dominion or Colony would mean orders for British workshops and ultimately cheaper supplies of the raw material for Lancashire factories.

Mr. R. H. JACKSON, Chairman of the Empire Cotton Growing Corporation, states:

Having been Chairman of the Executive Committee of the Empire Cotton Growing Corporation for the past three years, and a member of the Executive of the British Cotton Growing Association for a much longer period, I think I may claim to know something about what is required to increase the production of cotton in the various Crown Colonies in Africa.

In every area the question of transport comes up, and until this is settled, the problem is hopeless. What is the use of growing cotton or any other article if the cost of getting it to the consumer is so great that the market price, after paying for transport and other charges, leaves little or nothing for the grower? Carrying products by manual labour in head loads is most expensive, and also by taking labour from where it could be more profitably used is most wasteful. /

Last winter the Empire Cotton Growing Corporation sent Colonel C. N. French, C.M.G., C.B.E., to East Africa to find out on the spot what was required to help on Cotton Growing and the general development of the country.

The Government sent out the East Africa Commission for the same purpose, and where the two reports touched on the same problem, the conclusions arrived at quite independently agreed. The definite conclusions of the East Africa Commission were that the further economic development of these East African territories is dependent on the early provision of increased transport facilities; that little or nothing can be done without liberal financial assistance from the Imperial Government; and that an East Africa Loan Guarantee Bill authorising the issue of a loan for £10,000,000, guaranteed as to principal and interest by the Imperial Government, should be introduced, the money so obtained to be
used for railway extensions (in particular the 800 miles of new railway in Tanganyika and 200 miles in Uganda described in the Commission’s report), harbour developments and the provision of other transport facilities, and, further, that if the surveys for the new railways which they suggest in Tanganyika are not commenced this autumn, or those in Uganda next year, the expert staffs may have to be disbanded, with the consequence that, should a decision in favour of railway development in those territories be postponed too long, difficulty, expense and delay will be experienced in reassembling a constructional staff.

The report was considered by the Committee on Industry and Trade, who were so impressed by it that on July 2nd, 1925, they sent a memorandum to the Prime Minister strongly supporting the proposals on the ground amongst others that ‘British Industry, and in particular British export trade, would derive very considerable benefit from the development.’

The Empire Cotton Growing Corporation carefully considered the reports, and, with the British Cotton Growing Association and representatives of the employers and work-people in the cotton spinning and manufacturing areas, organised a deputation to Mr. Amery, Secretary of the Colonies, on July 30th, to recommend that immediate steps be taken to give effect to the recommendations of the East Africa Commission Report.

Mr. Amery gave the deputation a very courteous reception and, after listening carefully to the case put forward, replied that he was entirely in sympathy with the request made, and promised to do all possible to get a Bill put through to provide the money required. Since then we have been hoping to hear that the Government will take the matter up early in the next session, but, if we do not hear anything shortly, we shall have to consider what further steps to take to push the matter.

Until the transport can be provided in East Africa, the increase in the production of cotton is held up, and until a larger supply of cotton is obtained, I think the price will be too high for the Eastern Markets, and Lancashire may have to continue on Short Time.

Mr. FRED HOLROYD, J.P., President of the International Committee and President of the Federation of Master Cotton Spinners’ Associations, Ltd., states:

With reference to the article that has been written by Mr. W. H. Himbury, the General Manager of the British Cotton Growing Association, I am in absolute agreement with what he says. It is of vital importance that means of communication should be opened up as quickly as possible in the Cotton-Growing areas in the British Empire.

From my own personal knowledge, I can confirm what Mr. Himbury says with regard to the danger of retarding cotton-growing propositions in our
African Colonies and Protectorates because of this lack of adequate transport facilities.

I am fully convinced of the absolute necessity for this country to obtain adequate supplies of raw cotton which will make us less dependent on the United States. In our African Colonies and Protectorates we have the land and, in most cases, the labour; what is urgently needed is additional means of communication and transport.

In emphasising my statement that we should be made less dependent on America, having been in the States I can add that from what I ascertained when in that country that the American mill-owners are not going to be satisfied until they can consume their own crop by their own spindles. This being the case, no one can say how necessary it is – not only for the Cotton trade itself – but even the Government – to use every means at its disposal to encourage in every possible direction the production of cotton within the Empire.

Mr. WILLIAM HOWARTH, the Chairman of the Executive Committee of the Fine Cotton Spinners’ and Doublers’ Association, states:

I am in full agreement with the views expressed by Mr. Himbury in his article. The provision of transport facilities, whether in East or West Africa, is a profitable investment, and if we are to justify our control, the facilities cannot be withheld. It is not very long since that West Africa was described as the ‘white man’s grave.’ It is now one of the best markets for our goods. The standard of life has risen beyond our powers of measurement, and I have no hesitation in saying that further progress will be proportionate to transport development on proper lines.

Mr. J. CRINION, President of the Card Room Amalgamation, states:

Had the Government done years ago what we pressed, and what Mr. Himbury is now seeking, this country and the Colonies would have benefited immeasurably. There is no answering the arguments in favour of a large loan for the development of the Colonies. From a financial point of view it is surely better to spend money on a scheme which must eventually increase the wealth of the nation and provide employment at home and in our Colonies than spend money keeping workers who cannot find employment. I certainly hope the Government will see its way to do what those in the cotton trade have so long desired and which would so clearly redound to the good of the nation, particularly Lancashire.

Mr. A. A. PATON, C.B., President of the Liverpool Cotton Association, states:

The Liverpool Cotton Association has always taken a keen interest in Colonial and Dominion Cotton growing.

Those of us who have had extensive experience of Cotton fields and Cotton Growing, know that the most important thing is transport. I am heartily in accord with the British Cotton Growing Association that every possible Government support should be given for the transport of the Cotton in the seed.
to the gins, and from the gins to the seaboard for shipment to Liverpool. In my opinion, no Government expenditure would be as profitable as that expended on roads and railways in Africa, as it encourages agriculture and brings much-needed raw material to our ports and mills.

My Association has only recently adopted an Empire Futures Contract. This is of great importance to Empire growers, inasmuch as it affords them protection against any violent fluctuation in price after the commodity has once been marketed. The Liverpool Cotton Association is, and always has been, most anxious to help in every possible way, and to encourage the growth of Cotton in our widely-distributed Empire.

Mr. RICHARD BROOKS, Chairman of the Manchester Cotton Association, says:

Mr. Himbury's article on the necessity of increased transport in the duly developed parts of the Empire should arouse public interest in this important question. It is now some months since Mr. Ormsby-Gore returned from his tour in East Africa, and drew particular attention to the urgent need for increased railway development. Since this, various deputations have waited upon Government departments, and, so far as one knows, no steps have been taken, either by the Treasury or the Colonial Office, to raise the necessary loan. Until adequate railway transport is provided, Lancashire will continue to be under the dominance of the United States as regards her supplies of raw cotton, and, in my opinion, this county should continue to press the Government to provide as quickly as possible all facilities for the raising of the loan.

Mr. E. B. FIELDEN, Member of Parliament for the Exchange Division of Manchester, states:

The development of Cotton Growing within the Empire is a matter of supreme importance to Lancashire as we can no longer look to the United States of America continuing to export the bulk of her crop, as in the past. / It is therefore a matter for congratulation to those interested in the cotton trade that the Government are taking steps to develop Cotton Growing in East Africa and any wise expenditure on improving transportation in that part of the Empire will yield a rich return in a comparatively short time.

Mr. S. S. HAMMERSLEY, Member of Parliament for Stockport, states:

There is no doubt that improved transport facilities are essential in both East Africa and West Africa if Lancashire is in the future to obtain the considerable supplies of raw cotton which are so necessary if our position of dependence on America is to be mitigated.

Stimulating as is the knowledge that Uganda produced close upon 200,000 bales of cotton last year, this is only the fringe of a possible production, given the whole-hearted cooperation of Lancashire users, and the backing of the Government.
The urgent necessity for national economy will render abortive any direct subsidy to the transport needs of Uganda by the Government, but the Government can quite legitimately be urged to guarantee the interest on a loan which, on the closest examination, has every evidence of a sound business proposition.

Mr. W. M. WIGGINS, Member of Parliament for Oldham, states:

I hold the opinion that the safest and cheapest way for this or any Government to assist in extending the production of Empire-grown cotton is by financing the building of railways and roads.

I believe one of the first necessities of to-day is strict economy in administration, a reduction of the burden of Taxation on Industry.

But with this idea at the forefront of my mind, I am definitely in favour of the proposals which have been made from time to time, viz., that the Nation should guarantee the interest – for a short term of years, say 5 or 7 – on a Loan to be raised for the purpose of laying down Railways in Cotton-growing areas in Africa. No doubt the taxpayer of this country would have to meet the charge for interest during construction and for a short time after; but I am assured that very soon a railway of reasonable proportion would pay its way. The provision of railroads would not only assist employment here in manufacturing the material – it would be bound to assist our coal, iron and steel trades and thus reduce unemployment in those harassed quarters; would not only assist the cheaper marketing of cotton, but, in addition, would have a big civilising influence; must encourage other branches of agriculture in the areas railed.

And, as this developed, those lands would become potential and actual customers for home-manufactured goods.

It therefore seems to me that for the Government to guarantee, within limits, the interest which might cost for five years half-a-million a year, would be good business and true economy.

Sir S. H. H. HENN, K.B.E., M.P., Chairman Joint East African Board, and Member of Parliament for Blackburn, writing to the ‘Manchester Guardian,’ states:

DEVELOPMENT OF TROPICAL AFRICA.

To the Editor of the ‘Manchester Guardian.’

House of Commons, October 24th, 1925.

Sir,

As the mover in the House of Commons last year of the resolution which was accepted by Mr. J. H. Thomas, the Secretary of State for the Colonies, and led directly to the dispatch of the Parliamentary Commission under Major Ormsby-Gore to East Africa, I have read with profound satisfaction in this morning’s papers of the Cabinet decision to approve in principle the recommendation of
East African Commission’s Recommendations

that Commission for an Imperial guarantee for loans raised for transport developments in East Africa up to an amount not exceeding £10,000,000. / 

When the various works proposed to be constructed under this guarantee come to be considered, it is certain that pleas will be put forward in favour of those railways that offer prospect of an immediate or an early return on the capital, as against lines that may not pay their way and provide for interest and sinking fund for some time to come. I would, however, urge the Government to give preference over all other projects to the construction of a main trunk line to connect Dar-es-Salaam with the north end of Lake Nyasa, and I appeal to public opinion throughout the country to support this recommendation. I am not wedded either to the particular scheme suggested in the report of the East Africa Commission or to any other route, but I do most definitely assert my belief that from both an Imperial and an International point of view the early construction of this trunk line is of supreme importance: Imperial, because it would open up for development fertile areas in South-west Tanganyika, and eventually provide an outlet to the sea at a British port for North-eastern Rhodesia and Northern Nyasaland (consider in this regard the Conference of White Settlers from Kenya, Tanganyika, Nyasaland, and Northeastern Rhodesia held under Lord Delamere a few days ago at Tukuyo, near the boundaries of the three last-named territories); international, because our failure to date to show any serious intention of developing Tanganyika territory as it should be developed under the mandate is the main reason why the claim of Germany to have this particular colony returned to it is listened to with sympathy in many quarters abroad. Finally, this line would bring all the East African territories into direct transport communication and greatly advance the cause of good government.

Col. J. J. SHUTE, C.M.G., D.S.O., a member of the Council and of the Executive of the Empire Cotton Growing Corporation and an Ex-President of the Liverpool Cotton Association, states:

I should express the most profound disappointment if the Government in the very earliest session of Parliament did not immediately make arrangements for the issue of this loan, which would be of incalculable benefit to our home industries. We know by definite practical experience, which was only confirmed in our business mail to-day, from correspondents, / how badly this transport is tying up the development of moving to our Lancashire mills all the cotton which is badly wanted here.

I start on a personal tour of Uganda, Tanganyika, Rhodesia and South Africa, and shall doubtless see at first hand what I have already learned from others. Really my tour is a business one, but I shall not dissociate my mind from the fact that I am a member of the Council and of the Executive of the Empire Cotton Growing Corporation. The whole question now of the development of these Colonies depends on transport. The lack of transport is like a bogey over-
shadowing every other question. The climate, the soil and the labour are there. I cannot believe they will delay any longer in dealing with this question, in view of the very strong recommendation of the Commission which was sent out by the last Government. It should be understood that if finances do not allow of the absolute issuance of the money in the shape of a loan by the Government, surely there ought to be no difficulty in the Government giving assistance in the matter of guaranteeing the loan, for which the financial responsibility would certainly be limited only to the first few years whilst the railway was developing.

Sir WILLIAM BARTON, Wybersleigh Hall, Stockport, states:

The British Cotton Growing Association has recently entered a new period – it is no longer a pioneer only, but the master of a vital problem. We are getting British-grown cotton in bulk, and are in sight of a quantity sufficient to shift the balance of cotton control and ultimately to make us master of our own destiny in cotton. We can only fail now by lack of courage in the last lap. Transport is needed. East and West, transport and still more transport, and the men who should and could provide it are standing idle in the market place.

Our manager, Mr. Himbury, is the prince of managers, big enough for anything and meticulously careful in everything. He maintains contact with the work on the spot, and is starting on a further mission of help and oversight. The value of his visit is determined by his power to supply what he advises to be necessary, and he tells us that transport or paralysis confronts us, and transport means money, and big money. / A small man at the Treasury might shrink from giving the necessary guarantee, but Mr. Winston Churchill is no small man, and amongst his bewildering catalogue of requirements he knows cotton and all about cotton growing – his political birthplace was Oldham.

Sir HUMPHREY LEGGETT, Chairman of the British East Africa Corporation Ltd., and Chairman of the East African Section of the London Chamber of Commerce, said:

I have read Mr. Himbury’s article with deep interest and appreciation. He possesses a unique personal knowledge of the cotton fields, actual and potential, of the whole world, and his opinions and forecasts of what can be done within the British Empire itself are supported (although he is too modest to say so) by a remarkable record of success already achieved by the efforts of the British Cotton Growing Association under his inspiration and driving power.

The case of Uganda, to which his article chiefly refers, is specially striking. Less than 20 years ago, cotton production there was practically unknown. This year that country produced close upon 200,000 bales of the quality exactly needed by Lancashire, and the planting down for 1926 harvest indicates that the next crop will show a further marked increase.
Even in 1924–1925 very great transport difficulty and delay, accompanied by some serious damage and loss, was experienced in getting the Uganda crop to tide water and the world’s markets.

Despite all that can be done in the existing resources, those difficulties are bound to recur next season. The fear of such difficulties is in itself a discouragement to further planting.

It is probably true that had a comprehensive scheme of transport development been set on foot fifteen years ago, Uganda would now be producing not 200,000, but probably half-a-million bales per annum. Lancashire needs it all badly. And, as Mr. Himbury truly says, the greater part of the money spent in buying the crop comes back in the form of purchases of British-made goods by the cotton cultivators. /

Thus, the plea for ten millions of money to be guaranteed without delay to enable this stream to flow in both directions is a plea for the creation of permanent employment year in and year out in the Mother country, besides being the means of immediate employment by the expenditure of the loan itself upon the manufacture of the rails, rolling stock, bridges, etc., etc., to be all made in British workshops.

Immediate employment now, and the certainty of increasing the annual supplies of raw materials – reciprocal trade in manufactured goods – that is the prospect and, indeed, the certainty, if Mr. Himbury’s plea for prompt action be accepted without delay. But, if delays occur, the future of cotton development may be serious indeed, and that would increase unemployment. It is not a matter that can stand still.

Mr. J. T. BROWNLIE, a member of the Special Committee on Industry and Trade of the Board of Trade, states:

What are my views in regard to the Government granting financial assistance in regard to the development of cotton-growing in Uganda? Well, I am strongly in favour of the Government rendering all possible assistance that will further development of cotton-growing in East Africa and other cotton-growing districts of the Empire.

The Committee on Industry and Trade, of which I am a member, submitted a memorandum to the Prime Minister in the early part of July of this year, in which they made a recommendation that British industry would derive very great benefit from the development of the East Africa cotton-growing industry, for the encouragement of which the primary need is transport.

This recommendation was arrived at after being very carefully considered by various Associations connected with cotton-growing, iron and steel manufacture and the Trade Unions concerned.
Were the Government to give effect to the recommendation of the Committee, it would undoubtedly give a great impetus to export trade, inasmuch as the major portion of the money expended would be spent in this country. / Of course, it is not to be expected that the development of cotton-growing in East Africa would be an instant financial success in a commercial sense, but the benefits that would accrue cannot be over-estimated, inasmuch that it would mean the permanent development of that part of the Empire.

I sincerely hope that the Government will, at the earliest possible date, take action and thus stimulate industry and find employment for many who are at present unemployed.

Mr. C. PONSONBY, Managing Director of the British Central Africa Company, Limited, states:

I have recently returned from a tour of East Africa, Kenya, Uganda, Tanganyika and Nyasaland. It is perhaps a platitude to state that a consideration of these countries requires imagination and breadth of vision. Few people in 1890 could have visualised the Uganda of to-day, and this progress which has come almost suddenly in the last few years must be attributed to the breadth of vision of those who built the Uganda railway. Without it, there could have been no development. Uganda is a standing example of what can be done by a wide outlook. There is no doubt that similar enterprise in the other countries of East Africa will have even greater results, and owing to the more rapid civilisation of the native, the results will be obvious far more quickly than formerly. Each country of East Africa has enormous possibilities, given improved transport facilities, and the proposed expenditure of ten million pounds on railways – a considerable proportion of which would be spent on material in England – will help these possibilities to materialise. The Belgian Congo is moving quickly in this direction. Why should Great Britain lag behind in the race of civilisation?

Dr. ALFRED REE, President of the Manchester Chamber of Commerce, states:

Lancashire’s future depends largely upon the amount of cotton which can be produced within the Empire. What could be more disastrous than that the development of the industry in one of our most promising Colonies should be prevented through the lack of transport facilities. /

To my mind, it is not economy to refrain from using money in a manner which would ultimately increase the prosperity of Uganda, and, by doing so, help to provide Lancashire with her greatest need.

Mr. Himbury’s proposal is a practical solution of the difficulties barring the way to the Colony’s potential wealth as a cotton-growing country, and as a market for British industrial products. In my opinion, His Majesty’s Government should provide the financial assistance as advocated by the British Cotton Growing Association and so render it possible to secure the efficient transport
facilities which Mr. Ormsby-Gore’s Commission consider to be so urgently needed.

The time has gone when Great Britain can afford to dally with questions affecting the development of its Empire, and I sincerely hope that the representations being made by the British Cotton Growing Association will have the desired effect.

Sir ALFRED SHARPE, K.C.M.G., Ex-Governor of Nyasaland, and Chairman of the Mozambique Industrial and Commercial Co., Ltd., states:

I have read with very great interest the article by Mr. W. H. Himbury, of the British Cotton Growing Association, dealing with the question of a loan of ten million pounds (or more) for the purpose of stimulating the growth of cotton within the Empire.

Mr. Himbury points out most clearly the pressing need for giving realisation to the financial proposals made by the East Africa Commission appointed by the late Secretary for the Colonies, consisting of Major W. G. A. Ormsby-Gore, Major A. G. Church, and Mr. F. C. Linfield.

There could not be a more opportune moment for carrying out those proposals than the present. All political parties are unanimous in their approval of the proposals made in the East Africa Commission’s Report.

There is no object on our holding the vast territories we have in tropical Africa, with their enormous possibilities, unless we take steps to develop them. The first thing necessary for such development is the provision of cheap transport, which means the construction of railways and the provision of shipping facilities, and this cannot be too often reiterated.

Apart from the needs of Kenya, Uganda, and Tanganyika Territory, Nyasaland and Northern Rhodesia cannot possibly proceed with the development of their vast resources without the provision of cheap transport.

Everybody concerned or interested in the development of these territories has long since agreed that it is of vital interest that the bridge across the Zambezi River to connect the Trans-Zambesi Line with the Nyasaland Railway System should be at once constructed.

The Nyasaland cotton industry is suffering at the present moment from the fact that a rotation of crops is practically impossible, because comparatively cheap products such as maize, ground nuts, beans, etc., cannot at present be exported at a profit on account of the want of railway transport. When once these territories are connected by a through line of transport with the sea, Planters, both European and Native, will be able to institute a proper rotation of crops which will largely cut out the present loss from various cotton diseases such as Boll Worm, etc., which are due to continuing the cultivation of cotton year after year on the same ground.
I am well acquainted with these territories, and I have no hesitation in saying that the provision of a through line of rail transport will result in an enormous development both of the cotton industry and other planting interests.

Lord Derby, as Mr. Himbury states in his article, desires that the loan should be at least twenty million pounds instead of ten million pounds. As Mr. Himbury further points out, it is not necessary for the Treasury to find the money. If a Government guarantee of interest is given, all the money will be available in a day, and it appears to me that this guarantee should not be for a few years only, but as a permanency. Experience has shown that it takes a comparatively short time for any railway in tropical Africa to be in a position to pay its way and interest on capital.

Mr. H.T. POOLEY, General Secretary of the British Empire Producers’ Organisation, states:

Mr. Himbury has pointed out the all-important distinction between true economy and the mistaken withholding of productive expenditure. The Eastern and Central African Colonies would respond to a reasonable expenditure on transport facilities by tremendous development of foodstuffs and raw materials urgently needed in this country. Cotton is a particularly pertinent example of this; it is an essential raw material and we are mainly dependent on foreign production for our supplies. A precarious situation, especially in view of the growth of the spinning industry in America.

Another important point is that the greater part of the money spent for railway, harbour and transport developments in East Africa, would come to this country.

One example of very many may be taken in the Zambesi Bridge, if constructed, would provide work for the iron, steel and engineering trades in this country which is badly needed and would open up in Nyasaland and important districts of Rhodesia for the production of supplies essential to the well-being of this country, cotton looming large among them.

Producers generally will strongly endorse Mr. Himbury’s plea, and it should be remembered also that Empire producers are the best customers for British-manufactured goods.

Mr. G. H. LEPPER, London, who has taken a keen interest as regards Railways in Mozambique and the construction of the Zambesi Bridge, states:

Having devoted a great deal of time during the past three years to the task of endeavouring to arouse public interest to the national importance of accelerating the development of our great tropical estate in Africa, I wish to endorse to the full Mr. Himbury’s eloquent appeal for early action to give effect to the recommendations of the East Africa Commission regarding increased transport facilities. The new railways proposed, together with the Zambesi Bridge, will have an immense effect in stimulating the production not only of cotton, but of many other crops
for which we now pay in dollar currencies. The fabrication of the necessary material will give much-needed employment to some of our most depressed industries, thereby diminishing the amount spent on unemployment relief. Intensive development of tropical Africa will also enlarge the market for British exports and particularly those classes of exports which are most adversely affected by the trend of events in Asia. There are, therefore, three motives, each of which is sufficiently good in itself to justify prompt action in the direction of sanctioning the proposed £10,000,000 loan for new East African railways and roads, and the necessary guarantees to enable the bridging of the Zambesi to be put in hand.

Reprinted from the ‘Daily Dispatch,’ Friday, October 23rd, 1925.

THE RACE FOR COTTON.

HOW TO MEET FOREIGN COMPETITION.

It is very significant and somewhat perturbing that while Lancashire is discussing short time and depreciating markets, the Japanese cotton industry is bounding ahead. Half-a-million new spindles added last year; the number of mills doubled since 1907; the cotton consumption risen from 881,673 bales to 2,238,376, and the mills working two 11-hour shifts daily. These are figures to make one think.

At the same time we are told that while our cotton piece goods imported into Egypt during last July show a decrease of £69,000 compared with the previous July, Japan’s imports have gone up £14,000 and Italy’s £42,000. Nor are these isolated examples. Sir Arthur Balfour’s committee has placed it on record that the total imports of yarn into India from the United Kingdom in 1923–4 were 21,790,000lbs., compared with 37,836,000lbs. in 1913–14, whereas the Japanese imports jumped from 1,000,000lbs. in 1913–14 to 20,430,000lbs. last year. This will not do. Once again we would urge all concerned to go seriously into the whole matter.

Mr. J. A. Hutton has appealed to capital and labour to co-operate in increasing our supplies in new fields, and has stressed the need for transport facilities in our African cotton fields. If this is not done production by the natives may have to be stopped, simply because it is impossible to convey crops to the market. This deplorable and crippling lack of a bridge between the fields and the markets is only another factor which supports the argument we have repeatedly advanced – that the industry from raw material to finished article must be considered in its entirety. Sectional views, sectional interests sectional preoccupations must be subordinated to a clear vision of the whole. To ‘compartmentalise’ the cotton industry is to handicap its progress.

Industries are interdependent. If it is not only fallacious but paralysis not to look beyond the immediate industry in which one is engaged, how much more...
unbusinesslike and short-sighted it is not to see beyond the confines of a particular department of a specialised section. The greatest business need to-day is vision. When old methods fail new ones must be adopted. Trade depression is not a justification for despair but a challenge to enterprise. We do not say that much of the trouble which has afflicted the cotton trade was not inevitable, but we do not think it will be denied that some of it would have been readily overcome if there had been a stronger sense of common partnership and less internal disagreement.

Other countries do not intend to leave the future to Lancashire. The struggle for cotton supremacy has begun. If we lose in this, every other industry will suffer also. If we hold our own – better still, if we blaze new trails and win fresh markets – every other trade in the country will draw new energy and add to the prosperity of a recovering nation. /

Reprinted from ‘The Times,’ Saturday, October 24th, 1925.

DEVELOPMENT IN EAST AFRICA.

£10,000,000 LOANS GUARANTEE.

An important pronouncement on Empire Development was made by Mr. Amery, Secretary of State for Dominion Affairs and for the Colonies, at Bristol last night. He was responding to the toast of ‘United Empire’ at the annual dinner of the Bristol Branch of the Royal Colonial Institute, at which he was the chief guest.

Dealing with the development of tropical Africa, Mr. Amery said:– The Cabinet have decided to approve in principle the recommendation of the East Africa Commission for an Imperial guarantee for loans raised in connexion with transport development in East Africa up to an amount not exceeding £10,000,000 sterling. A Bill will be required to give the necessary guarantee. Surveys, etc., will be set on foot at once, and the precise works to be undertaken will be settled after thorough scrutiny of the financial and economic prospects of each individual project. It is anticipated that the work, in the main, will consist of new railways in Tanganyika Territory and Uganda, but provision for improvements in harbour and port facilities and for certain permanent, bridges and main roads is also contemplated. A small percentage of the loans will be specially earmarked for capital works and equipment in connexion with the further development of scientific research.

Mr. Amery pointed out that the West African colony which the House of Commons Committee wished to give up altogether 50 years ago was now one of the wealthiest and most progressive markets for British trade. In East Africa we had now, since the addition of Tanganyika Territory, an Empire within an
Empire of something like a million square miles and 12,000,000 inhabitants. That was a great responsibility. We could not afford, whether as mandatories or as a colonizing Power, to fail to develop these countries in such a manner that no one could say we had not fully done our / duty to them. The need for a progressive policy of development had been realized ever since the war, but the most important step forward taken was due to the initiative of Mr. Thomas, when, as Colonial Secretary, he sent out a Commission of three members, one from each party, under the chairmanship of Mr. Ormsby-Gore, to report on the whole situation. That Committee recommended a loan for harbour development. The Committee made a most valuable report on every aspect of the problem, on land, labour, health, education, and so on.

There was one point on which the Commission fastened as the crux of the whole problem – the development of the transport system, without which there could be no real progress, either for British trade in the area or for the development of the land and the welfare of the natives themselves. As the result of their investigations they had recommended that the Imperial Government should guarantee the raising of a loan on the lines he had indicated, and he was glad to say that he had persuaded the Government to adopt the same point of view. A thousand miles of new railways were contemplated in the scheme. The scheme of development in tropical Africa would in an indirect way help appreciably to reduce unemployment in this country. Orders would come in for the plant and material required for the railway schemes and road schemes, and later work would be required in connexion with maintenance. The iron and engineering industries should benefit. The areas would increase markets for British goods and the extension of cotton growing in Uganda would ensure adequate supplies of raw materials in Lancashire.

Reprinted from ‘The Times’, Saturday, October 24th, 1925.

NEW RAILWAY IN EAST AFRICA.
IMPERIAL GUARANTEE FOR LOANS.
CABINET DECISION.

(By our Parliamentary Correspondent.)

In his speech at Bristol last night, Mr. Amery, the Secretary of State for Dominion Affairs, announced that the Cabinet had decided to approve in principle the recommendation of the East Africa Commission for an Imperial guarantee for loans raised for the purposes of transport developments in East Africa up to an amount not exceeding £10,000,000.
A Bill will have to be passed through Parliament to give the necessary guarantee, but surveys will be begun at once and the precise works to be undertaken will be settled after a thorough scrutiny of the financial and economic prospects of each individual project. It is expected that the work will consist in the main of new railways in Tanganyika Territory and Uganda, but provision is also contemplated for improvements in harbour and port facilities and for certain permanent bridges on main roads. A small percentage of the loans will be specially earmarked for capital works and equipment connected with the further development of scientific research.

In their report, which was published in May, Mr. Ormsby-Gore and his two colleagues expressed the view that the further economic development of both native and non-native production in East Africa is dependent on the early provision of increased transport facilities, and in particular on new railway construction. Because little or nothing could be done unless the Government were prepared to assist liberally, they recommended the passing of an East African Transport / Loan Guarantee Bill which would authorize the issue of a loan for £10,000,000, guaranteed as to principal and interest by the Government and ranking as a trustee security. It was estimated that the construction period would be five years.

One reason that influenced the Cabinet in its decision was the stimulus which the development of East Africa is expected to give to trade and employment in this country. The Commissioners expressed the view that approximately half the capital sum would be spent in this country on rails, bridging materials, and rolling stock. Work would thus be found for the engineering industries of Great Britain, and the unemployment charges would be lessened accordingly.

Reprinted from the ‘Daily Dispatch,’ Saturday, October 24th. 1925.

EAST AFRICAN LOAN APPROVED.
DEVELOPMENT AID TO COTTON-GROWING.
NEW RAILWAYS.

(From our Political Correspondent.)

There will be considerable satisfaction in Lancashire with the news that the Cabinet has now approved in principle of the loan scheme for East African development.

A Bill will be introduced during the Autumn session and probably carried before Christmas, authorising an Imperial guarantee for a series of loans up to a total of £10,000,000 for transport development in East Africa.

The loans will be floated as and when the various constructional schemes have been approved.
Now that the Cabinet have sanctioned the scheme, immediate steps will be taken to put some of the work in hand, and the first thing to be done will be to start surveys for the new railways in Tanganyika and Uganda.

**ORDERS FOR ENGLAND.**

Development work is also to be undertaken in regard to harbour and port facilities at Mombasa and Kilindini and permanent bridges on some of the main roads are contemplated.

There will be a thorough scrutiny of the financial and economic prospects of each stage of development, and when the Government have approved them the loan will be sanctioned in each case. /  

A small percentage of the loans will be specially earmarked for capital works and equipment in connection with the further development of scientific research. The loans will be placed on the market in the ordinary way, and a large proportion of the money will be spent on material which will bring substantial orders to this country, thus benefiting particularly the iron and steel industry, as well as extending the facilities for cotton production in East Africa.

Mr. Amery, Colonial Secretary, speaking at Bristol last night, mentioned the approval of the loan, and said that the most important step towards development of the African Colonies was due to the initiative of Mr. Thomas, who, as Colonial Secretary, appointed the Commission. /

Reprinted from the ‘Manchester Guardian,’ Saturday, October 24th, 1925.

£10,000,000 FOR COTTON  
NEW RAILWAYS AND PORT FACILITIES.  
GOVERNMENT GUARANTEE OF LOAN.

**BRISTOL, FRIDAY.**

An important policy announcement in regard to Empire development was made by Mr. Amery, Secretary for Dominion Affairs and for the Colonies, at Bristol to-night. He was speaking in reply to the toast of ‘A united Empire,’ at the annual dinner of the Bristol branch of the Royal Colonial Institute, at which he was the guest of honour. Dealing with Empire trade development, and particularly with the development of tropical Africa, he said: The Cabinet have decided to approve in principle the recommendation of the East African Commission for an Imperial guarantee for loans raised in connection with transport development in East Africa up to an amount not exceeding £10,000,000 sterling. A bill will be required to give the necessary guarantee. Surveys, etc., will be set on foot
at once, and the precise works to be undertaken will be settled after a thorough scrutiny of the financial and economic prospects of each individual project.

It is anticipated (Mr. Amery continued) that the work in the main will consist of new railways in Tanganyika Territory and Uganda, but provision for improvements in harbour and port facilities, and for certain permanent bridges and main roads, is also contemplated. A small percentage of the loans will be specially earmarked for capital works, and equipment in connection with the further development of scientific research.

Mr. Amery pointed out that the West African colony which the House of Commons Committee wished to give up altogether fifty years ago was now one of the wealthiest and most progressive markets for British trade. In East Africa we had now, since the addition of Tanganyika, Territory an empire within an Empire of something like a million square miles, and twelve million inhabitants. That was a great responsibility. We could not afford, whether as mandatories or as a colonising Power, to fail to develop these countries in such a manner that no one could say we had not fully done our duty to them.

The need for a progressive policy of development had been realised ever since the war, but the most important step forward taken was due to the initiative of Mr. Thomas, when, as Colonial Secretary, he sent out a Commission of three members – one from each party – under the chairmanship of Mr. Ormsby-Gore, to report on the whole situation. That Commission recommended a loan for harbour development. The Commission made a most valuable report on every aspect of the problem, on land, labour, health and education, etc.

The report was presented to himself, and not, as might have been anticipated, to his predecessor. There was one point on which the Commission fastened, and it was the crux of the whole problem – the development of the transport system, without which there could be no real progress either for British trade in the area or for the development of the land and the welfare of the natives themselves. As the result of their investigations they had recommended that the Imperial Government should guarantee the raising of a loan on the lines he had indicated, and he was glad to say that he had persuaded His Majesty’s Government to adopt the same point of view.

He pointed out that a thousand miles of new railways were contemplated in the scheme. The scheme of development in tropical Africa, he emphasised, would, in an indirect way, help appreciably to reduce unemployment in this country. Orders would come in for the plant and material required in connection with the railway schemes and road schemes, and, later, work would be required in connection with maintenance. The iron and engineering industries should benefit. The areas would increase markets for British goods, and the extension of cotton growing in Uganda would ensure adequate supplies of raw materials in Lancashire.
LETTER FROM MR. W. H. HIMBURY.

To the Editor of the ‘Daily Dispatch’:

Sir,

Allow me to say with what extreme pleasure I read this morning the clear statement made by Mr. Amery, the Colonial Secretary, at Bristol the previous night.

My colleague and myself start on a tour of our Empire cotton fields on Tuesday. Nothing could be better calculated to make our mission pleasant or more memorable than the decision now given. It has come just as I am packing up, but I cannot leave without saying how deeply indebted I am to you for the space devoted to staging an appeal. Without the service so freely rendered by the ‘Daily Dispatch’, I feel satisfied that action so essential in this issue might have been indefinitely delayed.

The guarantee of this loan is, I feel satisfied, one of the biggest things done by a Government for Lancashire trade, and in the years before us will be so recognised.

Not a few besides myself, knowing the great patriotism of the Chancellor, felt he would allow no other consideration to stand in the way of applying the recommendations of the Committee appointed by the Right Hon. J. H. Thomas during the regime of the Labour Government. Time prevents me more than mentioning assistance extended by Mr. Amery, Major Ormsby-Gore, and many others who have been active in our joint movement during the past fortnight. Other means will be adopted for fulfilling this uncompleted task.

The real purpose of this hurried note is to recognise the important lead given by Mr. Thomas’s Committee and thank the ‘Daily Dispatch’ for all it has done.

(Signed)

W.H. Himbury.

[...]

CONFIDENTIAL.

COLONY AND PROTECTORATE OF KENYA

MEMORANDUM

ON

RAILWAY DEVELOPMENT

By LT.-COL. SIR EDWARD GRIGG, K.C.V.O., C.M.G., D.S.O., M.C.,

Governor and Commander-in-Chief of the Colony and Protectorate of Kenya, and High Commissioner for the Kenya-Uganda Railway.

NAIROBI:

[...]

1926. /

RAILWAYS.

1. Close attention is now being given in England to the commercial development of the basin of Lake Victoria, with particular regard to the growth and export of cotton, and an influential body of opinion is urging that Mwanza, at the south end of the Lake, should be connected by rail with the Central Tanganyika Railway for the special purpose of affording cotton and the other products of the Lake basin an alternative outlet to the sea in competition with the Uganda Railway. This memorandum is written as a broad presentment of the views of Kenya Colony and Protectorate upon that subject.
2. Kenya's main contention is a simple one. German rivalry in Tanganyika has been eliminated by the war. East Africa as a whole is now under British administration. Economic development is no longer limited by the old artificial international frontier nor need it be retarded by inter-colonial rivalry in trade and transport. Kenya therefore submits that the railway development of the East African territories should now be pushed forward on co-operative and complementary, not on competitive lines, and that railway questions affecting more than one of the East African territories should be judged by geographical and economic convenience without too strict a regard for existing inter-colonial boundaries.

3. It is true that the adoption of this principle must give all the territories a voice proportionate to their interest in railway questions outside their own boundaries; but the conquest of German East Africa and the placing of a continuous series of territories under British administration would seem to have little value if all questions of railway development which necessarily affect more than one territory are still to be considered and decided in watertight compartments. Kenya, at any rate, claims some right to be heard on common questions such as railway development even outside her own frontiers, because in the campaign which freed Tanganyika from German rule she bore a burden and made a sacrifice larger in proportion to her means than any other British colony of her size and settled population. It is no more than just that the effort which she then made for the Empire in East Africa should not be overlooked now that developments only made possible by the war are being discussed.

4. But she has no desire to use her share in the war as a form of special pleading for a policy or a principle the merits of which would otherwise be weak. On the contrary, she is firmly convinced that the policy which she advocates presents, on purely economic grounds, the soundest line of investment for British capital in East Africa at the Present time; and she desires it to be judged solely on its merits from the economic point of view. It is indeed her whole case that when the British taxpayer is about to invest ten millions sterling in East Africa free of interest for ten years, all narrow political considerations based on boundaries fixed in totally different conditions forty years ago should be firmly set aside, and attention given only to the best form of investment / regardless of inter-colonial boundaries, which the economic conditions permit. Kenya reverted to the history of the war only to prove her right to urge that case with what might otherwise seem an improper disregard for existing political landmarks.

5. Before the war Kenya marched on both her northern and southern frontiers with foreign territories, two of which were held by first-class European Powers. When war broke out, the total European population in Kenya was estimated at 3,500. The total number of adult males, of fighting age and over, including civil servants, missionaries and aliens, was 2,321. Of these 1,987
Grigg, Memorandum on Railway Development

volunteered for military service and rendered it. The war was at first mainly defensive; Kenya was threatened by German raiders all along her southern frontier, and largely by her own efforts staved them off. With the arrival a few months later of reinforcements from Europe, South Africa, and India the war was carried into German territory and resulted after very heavy losses in the complete conquest of the German Colony. The total lives lost in the East African campaign were 52,764. Of these, 2,365 were Indian, 3,781 European, and 46,618 (including porters and followers) African. The African troops, porters and followers engaged came from South as well as East Africa, but Kenya and Uganda suffered much the heavier share of the loss. The Indians came entirely from India. The great majority of the European troops came from the South African Union, Rhodesia, Kenya and Nyasaland. In addition to a heavy toll of lives, Kenya has actually paid in war expenditure nearly £700,000 out of revenue and has in addition to meet interest and sinking fund charges which will amount to three-quarters of a million on this account.

6. The campaign completely changed the political map of East Africa. For the first time British control was established over a continuous belt of tropical territories stretching from Rhodesia to the frontiers of Egypt, Abyssinia and Italian Somaliland. To Kenya this transformation brought one supreme advantage and with it a promise for the future such as had no existence before the war. She not only remained British herself, but she ceased to be an isolated British post, bounded north and south by foreign Powers. That was the accomplished fact. Its promise was that with the disappearance of German rivalry in trade and transport, from which both in the Lake Victoria and in the Tanga areas she had much to fear, co-operative instead of competitive development might be provided for in East Africa as a whole.

7. From Kenya’s standpoint, however, the results of the war are up to the present even less satisfactory than they seem to be elsewhere. The European population, estimated at a total of 3,500 in 1914, has indeed risen to well over 10,000, and amongst these are over 1,500 soldier-settlers who received land on special terms by instruction of the Imperial Government. Much capital has gone into the Railway and the Port, and since 1921 production has made amazing strides. But the picture has another and a less smiling side. Alone in the British Empire Kenya by the cession of Jubaland to Italy actually lost territory as a result of the war. The transfer was made without her knowledge, and she was comforted with the assurance that her expenditure would be considerably reduced. The promise has not been fulfilled. She retains an equally long and far less convenient frontier which threatens much future trouble and expense. Owing to its character, she has had to face an immediate increase of smuggling, which entails for 1926 alone an estimated loss of £25,000 in ivory revenue, and seems likely in a few years to destroy that branch of revenue altogether. In Kismayu and the Juba
River, moreover, she has lost an asset capable of great future development both as a stock- and crop-producing area. Nor is that all. In 1921, at a moment when the trade of the whole world had suddenly collapsed and Kenya herself was suffering from the results of a bad year, her currency was suddenly converted from rupee to sterling by Imperial instructions, with the result that overdrafts at the banks, which were then large and numerous, were increased overnight by over 50 per cent. The Colony was severely hit by the change, and the heavy interest and sinking fund charges referred to above were added to her recurrent expenditure from that period. Kenya's recovery since that date has been amazing, but it has not been due to any consideration given her for the services she has rendered or the sacrifices she has made.

8. The future, however, is still an open book; and for Kenya it will turn to a very great extent on whether she has to look for co-operation or for competition in the organisation of what was once German East Africa. Her own boundaries have been treated with small respect; and she considers herself entitled to a voice in matters which affect her closely to the south of the old international boundary proportionate to her share in wiping that boundary out. She submits that, since East Africa is now wholly British, the geographical facts, the racial configuration and the economic convenience of the country as a whole should no longer be subordinated to artificial boundaries established blindly in another age.

9. That is the foundation of the argument on the railway question set out in this memorandum. The old frontier between British and German East Africa, on which the most pressing railway and tribal questions turns, was ignorantly drawn forty years ago in Europe by diplomats who knew practically nothing about the country they were dividing and could not possibly have forecasted the lines of its development. Nothing could be more artificial than that frontier, whether from the tribal, or the geographical, or the economic point of view. Now that the British Empire administers both sides of it, the time has surely come to remedy its anomalies, in the interests of native, settler and trader alike. Why, Kenya asks, should an old and artificial frontier, which has lost its raison d’être, continue to dominate British minds as though it were an ineradicable feature of the soil, not a mere line upon the map?

10. These considerations evidently shaped both the instructions received and the conclusions reached by Lieutenant-Colonel F. D. Hammond, who was sent out by the Secretary of State for the Colonies in 1921 to report on the railway systems of Kenya, Uganda and Tanganyika, including marine and terminal facilities. His findings coincide exactly with the points which Kenya now desires to urge in regard to future railway development.
Colonel Hammond’s Railway Report, 1921.

11. In addition to making certain specific investigations, Colonel Hammond was asked in the Secretary of State’s instructions ‘to advise on railway extension generally – regarding Kenya, Uganda and Tanganyika as a single whole from the point of view of railway and harbour / development.’ In the last section of his report, entitled ‘Future Development of the Railway Systems of Kenya, Uganda and Tanganyika,’ he addressed himself to this question, arguing ‘the necessity to concentrate on one or two big ports, and to direct the policy of railway development accordingly.’ On these grounds, he recommended:–

(1) That the Voi-Kahe Railway should be reconstructed and made permanent, and that the area round Moshi and Arusha and their hinterland should evacuate its products via Kilindini instead of Tanga.

(2) That the aim of policy should be to develop the two principal ports, Kilindini and Dar-es-Salaam, and to direct as much of the traffic through them as possible.

(3) That a clear line of demarcation should be laid down between the areas to be served by these two ports and the railway systems based on them.

Colonel Hammond’s recommendations on the latter point were perfectly clear. He wrote (Report, Part III, p. 56, para. 290):–

‘The two main systems centring on Kilindini and Dar-es-Salaam are best described by the analogy of a large river system. The basin served by the former would include the Moshi and Arusha areas and any subsequent extension towards the south-east corner of Victoria Nyanza: the whole of Uganda and Victoria Nyanza is also included in this ‘basin’; and the ‘traffic watershed’ between it and the Dar-es-Salaam ‘basin’ would be along a line passing midway between Mwanza and Tabora and to the north of Kondoa Irangi until it finally meets the boundaries of the small Tanga ‘basin.’ The southern boundary of the Dar-es-Salaam ‘basin’ would correspond very closely with the eastern watershed of the Rufiji River down as far as the Pangani Rapids.’

It is precisely these recommendations for the demarcation of the ‘basin’ of the Kenya-Uganda railway system that Kenya now desires to see realised. The proposed railway ‘watershed’ between the Kenya-Uganda and Tanganyika systems corresponds exactly with the physical watershed, which is shown by the brown line in the map attached to this memorandum. The line runs just north of Shinyanga, so that Shinyanga belongs naturally to the Tanganyika basin, while the whole of the area south-east and east of Mwanza through which it is sug-

gested that the Shinyanga-Mwanza line should run falls equally naturally into the Kenya-Uganda basin. A dotted brown line shows the small Tanga basin.

12. The advisability of a demarcation of railway basins is raised in a pressing form by the fact that a railway is now under actual construction from Tabora to Shinyanga, and that the continuation of this line to Lake Victoria at Mwanza is being vigorously urged in many quarters. This branch was originally started by the Germans. Its object, / as Colonel Hammond pointed out,* was ‘to tap the rich districts of Ruanda and Urundi, and to divert both this and the traffic of the Mwanza district from the Uganda Railway Marine.’ Colonel Hammond added that, ‘with the absence of any motive for competition, the raison d’être of this line has disappeared.’ To Kenya and Uganda it is of the utmost importance that, before this branch line, condemned as unnecessarily competitive by Colonel Hammond, is completed, full consideration should be given to the following questions:–

(a) Whether, when the Tabora-Mwanza line is completed, competition between the Tanganyika and Kenya-Uganda railways can be avoided or minimised by agreement as to uniform import and export rates.

(b) Whether, even if agreement as to rates be possible, the construction of this line will not necessarily reduce returns on capital already invested in the railway systems and thereby delay fresh capital development to the detriment of new construction of a complementary and non-competitive character.

(c) Whether, pending the time when amalgamation of the two railway systems may become possible, the true line of economic development for East Africa, regarded as a whole from the standpoint of transport facilities, is not to accept the demarcation of railway basins proposed by Colonel Hammond and thus to avoid the dangers indicated in the two preceding paragraphs until they can be dealt with by a single authority with unified control of railway rates and finance.

The questions posed in these three paragraphs follow each other in logical sequence.

(a) The Question of Rates.

13. It is difficult to see how a uniform system of export and import rates over the two railway systems from Lake Victoria to the sea can in practice be applied. At present the two railway systems are financed by almost diametrically opposite systems of rates.

The Uganda Railway has aimed at the encouragement of production throughout the area which it serves. For this reason it has adopted a system of

* Report, p. 60, para. 296.
cheap long distance export rates and comparatively high import rates. Some of the import rates are very high; all the export rates are exceptionally low. Examples of the latter are the rate for groundnuts from Mwanza to the Coast, and the flat rate for maize from any part of the country.

The Tanganyika Railway has evidently had quite different conditions to face. It carries a large tonnage of copper ore from the Belgian Congo to the Coast. These minerals pay a comparatively high rate. But the trucks which carry them to Dar-es-Salaam would return empty to the Lake if the import rates were not low enough to persuade importers into the Belgian Congo to send their goods by the Tanganyika route. On the Tanganyika railway system therefore the established principle, exactly converse to that of the Uganda system, is to have fairly high export rates and comparatively low import rates.

14. The results of this divergence between the two systems can already be studied both in the Mwanza and the Moshi areas. In the case of Moshi, for instance, the Uganda Railway seems to be receiving only the low-rated export traffic, while the Tanga Railway takes the lion’s share of the more profitable import trade. In the Mwanza area also, the Uganda Railway is carrying the bulk of the export trade at very low rates, while certain far more profitable classes of import traffic reach Mwanza through Tabora, because the cost by rail and road from Dar-es-Salaam to the Lake is less for such classes of goods than the cost from Kilindini by rail and ship.

15. If the rates are not assimilated when the Mwanza-Tabora line is built, there must inevitably be a further diversion of the profitable import trade from the Uganda system – a loss which that system can only meet by raising its export rates proportionately, and thereby penalising production. On the other hand, the Tanganyika system could hardly raise its import rates to the same level as those on the Uganda system without sacrificing import traffic to the Belgian Congo. The only practicable course would therefore be to arrange a compromise under which the import and export rates on both systems would be as closely assimilated as possible. But any such compromise must so gravely affect the financial system of both railways, and also the fundamental conditions of trade and production in all three territories, that it would inevitably become the subject of continuous controversy between them.

16. The difficulty of adjustment, so far as the Uganda Railway system is concerned, is clearly shown by the following table of the import rates charged to the Lake area by the two railway systems on three important commodities:
Comparative Rates on Tanganyika and Kenya-Uganda Railways.

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<tr>
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<tbody>
<tr>
<td>Cotton cloth</td>
<td>217.40</td>
<td>254.17</td>
<td>561.57</td>
</tr>
<tr>
<td>Spirits</td>
<td>217.40</td>
<td>254.17</td>
<td>1125.15</td>
</tr>
<tr>
<td>Tobacco</td>
<td>304.27</td>
<td>355.76</td>
<td>1125.15</td>
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The importance of these high rates to the Uganda Railway is considerable. They make possible a low export rate on raw cotton and cotton-seed, and therefore give a stimulus to native production. The spirit and tobacco rates, on the other hand, are rates on luxuries, and they are almost entirely paid by the European population, which benefits in return by low export rates on its own produce. Kenya also maintains very high customs duties on spirits and tobacco, without apparently affecting consumption.

What any loss of revenue on the import of these commodities would mean to the Uganda Railway may be judged by the fact that the total receipts on these three commodities alone for the first nine months of 1925 amounted to no less than £242,419, or about one-sixth of the total revenue of the railway for that period, which amounted altogether to £1,490,219. The total advertised traffic receipts from all sources on the Tanganyika Railway amounted over the same period to £193,202.

17. Other examples might easily be given to show the profoundly disturbing effect upon the railway systems of rate competition or even of rate assimilation. The complexity and unpopularity of any such development would, moreover, be aggravated by the necessity of referring disputes to a distant authority in London, which would never be regarded as a satisfactory final arbiter on intimate local conditions. The delicacy of such questions, and the difficulty of reaching agreement on them, can be illustrated from chapter after chapter of the history of the railways in South Africa before the Union. Such controversies hamper trade and hinder development to an extent which can hardly be overdrawn. They make stable conditions of trade and production impossible, for every new compromise produces some unexpected result, or inflicts on some branch of traders or producers a change of conditions which they regard as intolerable, and so controversy and uncertainty are renewed perpetually. The only final solution of the problem is amalgamation of the railway systems. Until that becomes practicable in East Africa as in the South African Union, it is surely wise to avoid in East Africa, as foresight can, the controversies between Colonial railway systems which distracted South Africa for half a generation.

18. The difficult would, moreover, not be confined to the railways. It would extend to the organisation and direction of shipping on Lake Victoria, and even
to the port systems at Kilindini and Dares-es-Salaam. On the Lake it would presumably be agreed that the Tanganyika Railway should not start a marine service in competition with that into which Kenya and Uganda have already put much capital. Railway development now proceeding in Uganda will during the present year and more particularly during 1927 deprive the existing fleet of a considerable proportion of its existing traffic. Unless therefore the whole of the Lake Victoria basin remains available for exploitation by the Uganda Marine Services, it will be necessary to lay by ships and lighters on which heavy loan expenditure has already been incurred. Even, however, if competition on the waters of the Lake were avoided, controversy would be hard to avoid, for the Uganda Marine Services would be called upon to serve two railway systems with efficiency and impartiality and could never escape from criticism on one or other of these grounds or on both together. The same difficulty would extend to harbour dues at the coast; and opinion would ultimately be driven to conclude that the only alternative to free competition between the two systems was complete amalgamation.

(b) The Division of Traffic.

19. Whether, moreover, competition were free or limited by compromise agreements, it is surely undeniable that the completion of the Tabora-Mwanza line must lead to competition. Two railway systems will then be tapping the Lake Victoria basin instead of one, and whether they agree on rates or not, the trade of the basin, instead of going wholly to one railway, must be divided in some proportion or other between the two. For the Tanganyika system this is not an immediate objection since it carries at present very little of the trade of that basin, But from the point of view of the Uganda Railway, and also from that of the British taxpayer, it is a very serious one. Loss of traffic from the Lake must mean for Kenya and Uganda a slower return upon the capital invested in their railways and harbours, a longer period before rates can be reduced, a proportionately weakened stimulus to increased production, and some serious retardation of new railway construction. It would also compel immediate revision of the present policy of renewals and betterment on the main line. The British taxpayer, for his part, must look for all-round development, and the demand for goods which development produces; but if the capital which he devotes to developing one railway system is so used as to retard the development of another in which he is equally interested, he loses on the swings what he gains on the roundabouts, and is none the better off for his expenditure.

20. Not even for the Tanganyika system would competition for the Lake Victoria trade be an unmixed blessing. The capital invested in the Tabora-Mwanza line, where competition in some form is inevitable, is capital withdrawn from the construction of other feeder-lines, such as the greatly needed branch to Nyasaland and Northern Rhodesia, where the whole trade, import and export,
and every mile of new development would bring an undivided increment to the Tanganyika revenues. Not the least of Kenya’s objections to the Tabora-Mwanza line is that its construction must inevitably postpone the completion of essential arterial lines in both the northern and southern East African basins. Ten millions sterling are only ten millions; but they will go further if invested in complementary rather than competitive railway development.

This consideration is fortified by the fact that some part of the ten millions must of necessity be spent on bridging the Zambesi and thereby enriching Beira and the foreign or privately owned railways connected with it. Unless therefore another considerable part of the ten-million loan is available to press on the construction of a railway from the Tanganyika line to Northern Rhodesia through Nyasaland, the British taxpayer will merely be assisting to divert trade from a British port to a Portuguese one. To spend the British taxpayer’s money on enriching Dar-es-Salaam by impoverishing Kilindini is bad enough; but it seems even worse to spend it on fattening Beira and starving Dar-es-salaam, more particularly since the completion of an essential British railway connexion along the highlands south of the Tanganyika line must thereby be greatly prejudiced and perhaps long postponed.

On this question the views of Sir Sydney Henn, the Chairman of the Joint East Africa Board, who looks at East African affairs from an impartial stand-point and has studied them intimately, deserve respectful attention. Writing to the Manchester Guardian of October 24th on the allocation of the ten-million loan, he said:

‘I would urge the Government to give preference over all other projects to the construction of a main trunk line to connect Dar-es-salaam with the north end of Lake Nyasa, and I appeal to public opinion throughout the country to support this recommendation. I am not wedded either to the particular scheme suggested in the report of the East Africa Commission or to any other route, but / I do most definitely assert my belief that from both an Imperial and an International point of view the early construction of this trunk line is of supreme importance; Imperial, because it would open up for development fertile areas in south-west Tanganyika, and eventually provide an outlet to the sea at a British port for north-eastern Rhodesia and northern Nyasaland (consider in this regard the Conference of White Settlers from Kenya, Tanganyika, Nyasaland, and north-eastern Rhodesia held under Lord Delamere a few days ago at Tukuyu, near the boundaries of the three last-named territories); International because our failure to date to show any serious intention of developing Tanganyika Territory as it should be developed under the mandate is the main reason why the claim of Germany to have this particular Colony returned to it is listened to with sympathy in many quarters abroad. Finally, this line would bring
all the East African territories into direct transport communication and greatly advance the cause of good government.

It is interesting to note that while actually writing this paragraph, I received a telegram saying the Governor of Northern Rhodesia, having to travel to the Governors’ Conference by Beira, had been stopped by floods and had consequently missed his steamer. The episode lends force to Sir Sydney Henn’s concluding observation.

21. The arguments of the preceding seven paragraphs apply with equal force to the Moshi-Arusha district. No one has suggested that it would be wise or even practicable to develop the port of Tanga in competition with Dar-es-Salaam and Kilindini. Tanga, with its present facilities, will continue to serve a small coastal hinterland, but the main trade of the Moshi-Arusha district must go either to Kilindini or Dar-es-Salaam. Moshi is already connected by rail through Voi with Kilindini. A new line already surveyed by the Tanganyika Government will extend that connexion to Arusha. No railway engineer or business man, looking at the geographical configuration of the country, could well dispute Colonel Hammond’s verdict that the natural outlet of the Moshi-Arusha area to the sea is through Kilindini.

To build a competing connexion from Arusha to the main Tanganyika line, which must go through harder and less profitable country unless a long detour be undertaken and the mileage to the sea proportionately increased, can never be an economic proposition until both trade and policy require a continuous north and south arterial connexion. There is no such prospect yet in view, and in the meanwhile division of the trade of the Moshi-Arusha district between two railway systems could lead to nothing but an accentuated form of the rate problem already dealt with in regard to the Mwanza area. In other words, it would lead only to retarded development and waste of capital.

(c) Demarcation of Railway Basins.

22. It seems therefore clear that there are great advantages to be gained, and equally great disadvantages to be avoided, by the demarcation of railway basins proposed by Colonel Hammond four years ago. The practical value of his suggestions stands out plainly now that it is actually proposed that the two railway systems should enter the same basin, whether in the Mwanza or the Arusha areas, and divide the trade between them. For Kenya and Uganda that prospect is particularly threatening at a moment when they are reorganizing their seaport at Kilindini and putting further capital into it. The penetration of a second railway system into the basin which that port is designed to serve must necessarily put a very different complexion upon the project of fresh capital expenditure on harbour facilities and upon the prospect of reducing harbour dues. For a sec-
ond railway tapping the same area must mean competition, and the preceding paragraphs have shown that even assimilation of rates cannot in practice so neutralize competition as to prevent it from affecting most gravely the whole basis on which both railway and port are at present financed.

23. Serious, however, as this question is for Kenya, Uganda, and other parts of East Africa, which must all suffer if the present policy is not revised, it does not affect East Africa alone. It is also a serious question for the British taxpayer, who can hardly wish to see ten millions sterling of his money devoted to mutually damaging forms of enterprise. Yet if part of that sum is spent on Kilindini Harbour, and part of it on branch lines from the Tanganyika line to the Mwanza or Arusha areas, the former investment suffers directly from the latter. It is a policy, or a lack of policy, which defeats itself. The demarcation of railway basins seems indeed to be the only means of saving the British national capital already invested or soon to be invested in East Africa from this unprofitable competition with itself. Are there, any objections to the policy of demarcation so serious as to outweigh its evident advantages?

24. Colonel Hammond’s proposed demarcation has been so completely lost to sight during the last five years that there has been no recent consideration given to it; but the following possible objections emerge by inference from the discussions of railway development which have recently taken place:–

(a) That the Uganda trade urgently needs an alternative outlet to the sea, and that production in Uganda will be stimulated thereby.

(b) That the port of Kisumu can never be adequately developed to take the whole of the Lake Victoria trade.

(c) That a local railway is necessary to develop the Mwanza area.

(d) That the Tanganyika Railway is entitled to all the trade of Tanganyika Territory, including the Mwanza and Moshi-Arusha areas, and that the Mandate forms a serious obstacle to any other line of development.

It will be convenient to take these objections in turn.

(a) Uganda’s Need of another Outlet to the Sea.

25. The question whether production in Uganda would be stimulated by the establishment of another transport route to the sea has already been explored in paragraph 13–19 of this memorandum. The present state of the railways in Canada is perhaps a sufficient additional illustration of the fallacy that two competing railway systems are better for a developing country than one. /
railway purposes before 1923, the Uganda Railway has suffered from serious congestion during the past two years; but impatient remedies of such trouble often produce even worse, though different, results. The capital necessary to increase the carrying capacity of the Kenya-Uganda main line is far less than the capital necessary to build the Tabora-Mwanza line. A great deal of the necessary capital, and further large sums allocated to renewals and betterment from revenue, have indeed already been devoted to that object, and the hard work done, in the face of unceasing criticism, by the present General Manager of the Railway is just beginning to bear fruit. But a great deal of the expenditure incurred for catching up arrears in maintenance and expanding the carrying capacity of the line to meet a rapid development of trade will be thrown away, if part of that expected trade is diverted to another line; and while Kenya and Uganda’s expenditure is thus being wasted, Tanganyika must incur new expenditure for similar improvements on its own line. For investors, traders and producers alike, this would be an expensive procedure to pursue.

27. If any doubt exists regarding the future capacity of the line, it should be removed by comparison with the traffic carried by the Natal main line. The following statement by the General Manager of the Uganda Railway points this comparison:–

‘The Natal single main line, when I left South Africa, was carrying 21,000 tons per day. I believe it has since carried up to 25,000 tons per day.

‘We have never yet been asked to carry more than approximately 1,500 tons per day on the section between Nakuru and Kilindini, and there is no reason whatever why that section should not be developed to make it capable of carrying certainly 12,000 tons per day, and probably much more, without doubling, provided the Port is developed and worked so as to fit in with the railway system. It is most unlikely that for the next fifty years the line will be asked to carry anything like 12,000 tons per day, unless there is a big mineral development in the interior, of which no signs are apparent to-day. The Natal heavy traffic includes, of course, coal for export and bunkering. In Kenya and Uganda we are still entirely dependent on agricultural traffic and precedent or consequential imports.

‘We are relaying the main line between the Coast and Nairobi with 80lb. rails. That will treble, and may quadruple, the capacity in the matter of engine loads. Further increases in capacity will depend, as they do on all railways, on the number of crossing stations, and numerous crossing stations can be put in without difficulty.

‘The section between Nairobi and Nakuru presents the only difficulty. For that section I am ordering ‘Garrett’ engines, which will take, I hope, up to double the present loads. If that is not enough we should relay the line with 80lb. rails; and if that does / not increase the capacity sufficiently, or even before relaying
with 80lb. rails is resorted to, we could relieve the whole position by the simple process of running a loop line from Nairobi through Ngong to Kijabe (a section which has been reconnoitred since my appointment here), thereby not only providing a double line but avoiding the bad grades on the existing line between Nairobi and Longonot.

‘In my opinion, relaying with heavier rails, strengthening bridges, increasing the number of crossing stations, building larger engine depôts and depot yards, etc., would increase the capacity of the main line from Nakuru to the Coast sufficiently to meet any demand likely to be made upon the Uganda Railway for the next fifty years, but if I should prove to be wrong, doubling could always be resorted to.’

The General Manager adds, with reference to the suggested need of another outlet for Uganda to the sea, that, ‘Surely, unless competition is a deliberate object, developing one line to its full capacity is the sound business method.’ It may also be observed that doubling the whole main line, when necessary, would involve a smaller tax on capital and development than the competition of two main lines, whether regulated by rate agreements or not. The example of Canada is the gravest possible warning against the increase of capital burdens without return which results from over-hasty development of competitive main lines.

28. A word is called for by the General Manager’s reference to port management, which is of the highest concern. The task of the railway has undoubtedly been aggravated in the past three years by congestion at Kilindini. The two new deep-water berths, with their modern equipment of cranes and sheds, are now coming into operation; two new berths are to be built with as small delay as possible; and the whole business of harbour management has been reorganized on lines which will greatly facilitate the railway’s task. It would at least be well to give this new organization, with all the expenditure entailed, a year or two’s trial before committing the railway and the port to competition with another transport system so short a distance, as African distances go, to the south.

29. It should also be remembered that the traffic on both the Tanganyika and the Uganda Railways is at present swelled by the carriage of construction material for new lines. That fact bears closely upon any estimate that may be made of the ultimate carrying capacity of the railways and of the revenues which they will earn. The Uganda Railway is endeavouring to keep its debt charges as low as possible against the time when construction slows down and revenues in consequence fall by allocating a large proportion of its earnings to renewals and betterment and by other means. This aspect of the railway question should not be lost to mind by those who urge that the immediate prospects of trade justify and even necessitate the establishment of competition between the Tanganyika and Uganda lines.
(b) The Port of Kisumu and Lake Traffic.

30. The argument that Kisumu, owing to its shallow approaches and other natural disadvantages, must ultimately prove incapable of evacuating all the developing traffic of the Lake may be conceded without reserve. But that time is far ahead, since the pressure of traffic on Kisumu will be considerably relieved in the near future when the main line through Uganda north of the Lake is completed. Through railway connexion with Jinja will be established by the middle of 1927, unless unforeseen reasons prevent. A shorter connexion from the neighbourhood of Tororo to Jinja is now being surveyed. It is expected that the traffic down the Mbale-Tororo road to Mjanji will be diverted to the new railway by the end of the present year. Kisumu will therefore more and more depend upon trade from the southern half of Lake Victoria, and an increased flotilla of tugs and lighters is already being provided to carry traffic from the smaller ports and piers. Kisumu can thus fully serve the Lake for many years to come; and when it begins to prove inadequate, Jinja with its excellent harbour will be available for Lake trade. Ultimately, the traffic of the southern end of the Lake may justify a separate railway outlet to the sea; but the shortest route for such an outlet, to which reference is made in the next two paragraphs, would be by junction with the Kenya line to Kilindini, not by junction with the Tanganyika line to Dar-es-Salaam. The prospects of Lake traffic and the Lake ports for many years to come give no ground for the establishment of competing railways from the Lake to the sea, whether regulated by agreements or not.

(c) The Need of a Railway for the Mwanza Area.

31. The objection that the Mwanza area cannot be left without a railway is also sound so far as it goes; but it is not an argument against the proposed demarcation of railway basins. It is generally agreed that the best alignment for a railway intended to develop the Mwanza hinter-land is east of the direct line to Tabora. Such a line, pushed eastwards as conditions required, could for some time evacuate its traffic through Mwanza and the Lake, and it would eventually be linked with the Uganda Railway either through Arusha and Moshi, or, if that alignment were attended with too serious difficulty, through Magadi or South Kavirondo. Like many other coastal regions round the Lake, Mwanza may also be profitably and cheaply developed by feeder-roads running either to Mwanza itself or to small subsidiary ports where piers for tugs and lighters may be built at small expense. The need of these has already been urged by the Kenya and Uganda Governments.

32. It is in any case highly desirable, before the alignment of the Mwanza railway is finally determined, to have the country between Mwanza and Arusha freshly surveyed. All that is known about it at present is through a German survey,
and the Germans had special reasons for wishing to deflect traffic to the Central Tanganyika Railway and Dar-es-Salaam. It is the fact, moreover, that other German surveys have been found unsatisfactory. The Governor of Tanganyika has noted this in regard to the German railway survey of the Ngerengere-Kilombero area and the German railway survey reports of the country between the Igali Pass and Ilongo. It will also be remembered that our own first estimates of the cost of reconditioning the Voi-Moshi railway were extremely inaccurate. It was announced in Parliament, presumably on local advice, that the work would cost half a million. After much hesitation, due to this estimate, the line was ultimately put in working order by the Uganda Railway for £30,000. It is therefore not unreasonable to ask that old surveys and estimates for the construction of a line between Mwanza and Arusha should be checked by fresh reconnaissance. /

(d) The Inter-Colonial Frontier and the Mandate.

33. There remains the argument that Tanganyika Territory is naturally and properly entitled to build what railways it considers advisable within its own boundaries. The claim which Kenya advances to be heard on this question has been stated earlier in this memorandum and need not be repeated. Her view may be summarised in a sentence, already used – that ‘the conquest of German East Africa and the placing of a continuous series of Territories under British administration would seem to have little value if all questions of railway development which necessarily affect more than one Territory are still to be considered and decided in watertight compartments.’ The whole of this memorandum is an argument against the competition and waste which that method must inevitably produce.

34. As to the Mandate, there is no reason why its terms should create any difficulty in the proposed demarcation of railway basins. There is, in fact, a clause in the Tanganyika Mandate which provides for necessary administrative reorganization. There are also precedents for linking Mandated Territory with a British Colony for one purpose or another in West Africa and elsewhere. To the League of Nations it cannot matter what British administration undertakes this or that responsibility in Mandated Territory, provided the terms of the Mandate be respected and the responsibility duly discharged.

Conclusions.

35. To Kenya, then, the objections that may be urged against the demarcation of railway basins proposed by Colonel Hammond do not seem insuperable. All that is required for the moment to give that policy effect is that the principle of demarcation by the natural watershed should be accepted as the basis of future development, and that the proposed extension of the Tanganyika line from Tabora to Shinyanga which lies south of the natural watershed, should
not be continued over the watershed into the Lake basin. The possible effect of demarcation of railway basins upon existing administrative boundaries may indeed require the closest consideration; but such questions are not relevant to a memorandum on the economic problem of railway development, nor do they call for any urgent solution. All that is urgent is, by acceptance of the principle of demarcation of basins, to save East Africa from an era of competitive instead of co-operative development, and from all the retardation, controversy and waste which railway competition, however regulated, must inevitably produce.

36. It would in truth be better for trade and production in Kenya and Uganda that there should be no ten-million loan at all than that a part of that loan should be applied to financing competition against their railway and their port. They can raise on their own credit sufficient capital to complete all the railway and harbour development necessary to serve the Lake Victoria basin as whole. Competition against them, on the other hand, would not be possible without the British taxpayer’s aid. How gravely such competition affected both Colonies would naturally depend on circumstances, such as good and bad years, which cannot be foreseen; but whatever their prospects, they would in any event be altered for the worse. Even the privilege, if granted, of paying no interest for a period on such part of the ten-million loan as might be allocated to them would not compensate them for any considerable loss of traffic to another line; and they would have to begin paying interest on the loan at a period when the results of competition would probably not yet have been made good by increase of trade and new development.

37. It is, of course, not only certain but also desirable that the railways of British East Africa should ultimately be linked up. But the whole trend of East African traffic is from the coast to the interior and from the interior to the coast, or roughly east and west. The railway system based on Kilindini is the natural inlet and outlet for the trade of Lake Victoria. The system based on Dar-es-Salaam is, on the other hand, the natural inlet and outlet for the valuable trade of Lake Tanganyika and the Southern Congo, and of the two British Colonies, Nyasaland and Northern Rhodesia, lying immediately to the south. To carry the southern system into the basin of the northern system, until the trade of that basin is really beyond the single capacity of the railway already serving it, can only be to squander capital on competition in the north which should be spent on new construction in the south. It is therefore surely wise, as Colonel Hammond proposed, first to develop both railway systems from east to west and to delay the north and south connexions until the necessary main lines from east to west are complete.

38. To summarize, the policy of demarcation of basins follows the natural physical and economic configuration of the country, the main channels of which run east and west. To recognize this principle in the investment of capital makes
certain that all the capital invested will pull its full weight. It is the only means, moreover, of avoiding competition in the period of development. How disabling such competition may be in growing Colonies South African history is there to illustrate. Lord Selborne, in the famous memorandum which first raised the question of union, described it as ‘a monstrous state of affairs ... the direct result of frontiers arbitrarily ruled across the map of South Africa between sections of one community which corresponded to no real political or physical lines of division’; and in another passage he pointed to union as the only final remedy for a system in which the railways were ‘cut up by political accidents of the past utterly at variance with the natural conditions of railway administration.’ Closely as this description fits the present situation in the northern East African basin, Lord Selborne’s remedy is not practicable in East Africa as yet; but it is possible to apply a temporary remedy here until conditions are ripe for the closer union which ultimately made an end of inter-colonial competition in South Africa. That temporary remedy is demarcation.

39. I trust, in conclusion, that the Governors of other East African Territories will condone the liberty which I have taken of speaking at large on East African affairs. They will, I think, endorse the claim that Kenya’s service in the war entitles her to be heard on questions so closely affecting her, even beyond her own boundaries; and I apologize to them if in any argument that I have used I have unwittingly transgressed the limits to which that claim may properly be pressed. No question, outside the vast range of questions raised by native welfare and government, is of greater importance to Kenya than the co-operative organization of railway development. In the Lake Victoria and Tanganyka areas that question is now urgent and acute; and being responsible for the interests both of Kenya and of the Kenya-Uganda Railway, could not conscientiously have abstained from explaining how seriously both interests may be affected by the policy of inter-colonial railway competition now being advocated in influential quarters at home. Nor could I properly have failed to call attention to the practical alternative advocated by the only great railway authority who has been invited to study East African railway development as a whole since the map of East Africa was transformed by the Treaty of Versailles.

EDWARD GRIGG.

Nairobi,

January 18th, 1926.
EDITORIAL NOTES

Part 2, Nos 1 and 2. Messrs Fitzgerald and Mercer to Colonial Office and Colonial Office to Messrs Fitzgerald and Mercer

1. Sir Garnet Wolseley: Field Marshal Garnet Joseph Wolseley, first Viscount Wolseley (1833–1913), an Anglo-Irish officer, who served in Burma, the Crimean War, the Indian Mutiny, China, Canada, and in Africa – commanding the Ashanti campaign (1873–4) and the Nile Expedition against Mahdist Sudan (1884–5). The Ashanti campaign lasted just two months. After the battles of Amoaful and Orhahsue, his forces entered Kumasi, which they burnt to the ground (see H. Kochanski, Sir Garnet Wolseley: Victorian Hero (London: Hambledon Press, 1999)).

2. Sir M. Hicks Beach: Michael Edward Hicks Beach (1837–1916), a Conservative politician, who served as Chancellor of the Exchequer (1885–6, 1895–1902) and led the Conservative Party in the House of Commons (1885–6).

Reports on Inspections Made to Ascertain the Best Lines of Possible Railway Extension in the Colony

1. Aneroid: An aneroid is an instrument that measures the height above ground.

2. Trochometer: A trochometer is an instrument that measures distance via the revolutions of a wheel.

Correspondence having Reference to Construction of Railways in Territory of Bechuanaland

1. Lord Knutsford to Sir H. Robinson: Henry Thurstan Holland, first Viscount Knutsford (1825–1914), Conservative politician and Secretary of State for the Colonies from 1887 to 1892.

2. Lord Gifford: Major Edric Frederick Gifford, third Baron Gifford (1849–1911). From 1889, a director of the British South Africa Company.


6. *Mr. Murray to Captain Bower*: Sir Graham John Bower (1848–1933), Imperial Secretary to the High Commissioner for Southern Africa.

**Railway Extension through British Bechuanaland**


2. *J. GORDON SPRIGG*: Sir John Gordon Sprigg (1830–1913), administrator, politician and four-time Prime Minister of the Cape Colony (1878–81, 1886–90, 1896–8 and 1900–4).

**Bentley, Handbook to the Uganda Question**


4. *British anti-Slavery Society*: The British and Foreign Anti-Slavery Society was founded in 1839 with the goal of abolishing worldwide slavery.


**The Railway Extension from Charlestown to Johannesburg**

1. *JOHN ROBINSON*: John Robinson (1839–1903), the first Prime Minister of Natal.

**Memorandum on the Question of the Delagoa Bay Railway**


2. *force majeure*: a superior or overpowering force.


7. **President Krüger**: Stephanus Johannes Paulus Kruger (1825–1904), State President of the Transvaal (1883–1900).

8. **Sir Hercules Robinson**: Hercules George Robert Robinson, first Baron Rosmead (1824–1897), colonial administrator.

9. **Senhor Barros Gomes**: Henrique de Barros Gomes (1843–98), Portuguese politician, member of the Progressive Party. Minister of Foreign Affairs (1886–90), Minister of the Navy and Overseas Territories (May–September 1887), Minister of Finance and Public Administration (February–November 1889). As Minister of Foreign Affairs, he played an important role in the 1890 British Ultimatum, an ultimatum by the British government delivered on 11 January 1890 to Portugal, which required the removal of Portuguese military forces from the lands between the Portuguese colonies of Mozambique and Angola that had been claimed by Portugal.


11. **Lord Rosebery’s**: Archibald Philip Primrose, fifth Earl of Rosebery (1847–1929), Liberal statesman and British Prime Minister (1894–5).

12. **Lord Kimberley**: John Wodehouse, first Earl of Kimberley (1826–1902), Liberal politician. Secretary of State for the Colonies (1870–4) and Foreign Secretary (1894–5).


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**Cardew, Railway Schemes for the Colony of Sierra Leone**

1. **His Excellency GOVERNOR CARDEW**: Sir Frederic Cardew was Governor of Sierra Leone from 1894 to 1900.

2. **Mr. Shelford**: Frederic Shelford, consulting engineer to the Crown Agents. See General Introduction, above.

3. **Mendis**: The Mende are one of the two largest and most dominant ethnic groups in Sierra Leone. They were largely farmers and hunters.

4. **benni seed**: the small oval seeds of the sesame plant.

5. **kola**: Kola (or cola) nuts are the seeds of the cola tree, which contain caffeine and theobromine and were used medicinally and, more recently, in the manufacture of soft drinks.

6. **kamwood**: or cam wood comes from the West African leguminous tree, *Baphia nitida*, whose hard wood was used in making a red dye.


8. **Mr. J. Holt**: John Holt (1841–1915), merchant and founder of a shipping line operating between Liverpool and West Africa.

9. **Mr. Zockonis**: George Zochnis (d. 1929). Founder (1879), with George Paterson, of Paterson Zochnis, a large West African trading house.
The Beira Railway

1. **W. E. FAIRBRIDGE**: William Ernest Fairbridge, founder of the Mashonaland Herald (1891), the first Mayor of Salisbury (1897–8), and general manager of the Argus Company of newspapers (1904–15).


3. **the Mozambique Company**: The Mozambique Company (Companhia de Moçambique), founded in 1891, was a royal company in the Portuguese colony of Mozambique, that had the concession of the lands that include the provinces of Manica and Sofala.

4. **Mr. Mansergh**: James Mansergh (1834–1905), a civil engineer.

5. **MR. BYRON REED, M.P**: Henry Byron Reed (1855–96), a Conservative politician.

Betton, ‘Prospective Railway Development in British Equatorial Africa’

1. (*palavers*): A palaver was a negotiation between Europeans and representatives of local populations.

2. **Nilotic tribes**: The Nilotic resided in the Nile Valley.


4. **Emin Pasha**: Mehmed Emin Pasha, born Isaak Eduard Schnitzer and baptized (1847) Eduard Carl Oscar Theodor Schnitzer (1840–92), physician, naturalist and governor of the Egyptian province of Equatoria on the upper Nile.

5. **papyrus**: A papyrus is a tall, aquatic, Mediterranean sedge (Cyperus papyrus) that has numerous drooping rays grouped in umbels. Also called the paper plant.

6. **corduroy bridges**: A corduroy bridge is a bridge made of logs laid transversely. Used to cross swamps.

Informal Conference with Mr. F. Bedford Glasier

1. **Mr Morel**: Edmund Dene Morel, originally Georges Eduard Pierre Achille Morel de Ville (1873–1924) was a journalist, author, socialist politician and former employee of Sir Alfred Jones, whom he despised. He campaigned against the Belgium atrocities in the Congo and the First World War (For more see A. Hochschild, *King Leopold's Ghost* (London: Pan, 1998).

2. **Dahomy Railway**: Dahomey was a French colony in West Africa in what is now Benin.

3. **Morning Post**: The *Morning Post* was a conservative daily newspaper published in London from 1772 to 1937.

4. **Canadian Pacific Railway**: The Canadian Pacific Railway was built between eastern Canada and British Columbia from 1881 to 1885.

5. **Conakry had two contractors to build the railway there**: Presumably Jones is referring to French Guinea.

6. **‘Open Line’ staff**: Open line staff operated completed railways.
**The Right Railway System and the Best Outlets for Nigeria**


**Report on Transport Policy to Develop the Northern Provinces of Northern Nigeria**


2. *Borgu*: Borgu was a state in West Africa in what is now Nigeria and the Republic of Benin.

3. *shea tree*: A shea tree is a tropical African sapotaceous tree, *Butyrospermum parkii*, which has oily seeds.


5. *sylvan*: relating to woods or forests.

6. *Imported cotton goods*: Cotton gins are machines that separate the seeds, hulls and other small objects from the fibres of cotton.

**Transport in Africa. East African Commission’s Recommendations**

1. *Daily Dispatch*: The *Daily Dispatch* is a South African newspaper published in East London and founded in 1872 as the *East London Dispatch*.


4. *the Fine Cotton Spinners’ and Doublers’ Association*: The Fine Cotton Spinners and Doublers Association Limited promoted the interests of cotton spinners in the north-west of England. It was founded in 1897 by Herbert Dixon and Scott Lings.


8. **London Chamber of Commerce**: The London Chamber of Commerce and Industry was founded on 25 July 1881 at the Mansion House in the City of London to represent business in the London Metropolis.

### Grigg, Memorandum on Railway Development

1. **Lt.-Col. Sir Edward Grigg**: Edward William Macleay Grigg (1879–1955) was a British colonial administrator and politician. After serving in the Grenadier Guards during the First World War, he became private secretary to Prime Minister David Lloyd George (1920), and, in 1922, entered Parliament himself as the Liberal MP for Oldham. Three years later, he resigned his seat to take up the post of Governor of Kenya, where he worked to improve the agriculture, education provision and the infrastructure of the territory. On leaving Kenya in 1930, he re-entered Parliament, this time as a Conservative representing Altrincham, and, on the outbreak of the Second World War, became first the financial secretary and then the Joint Parliamentary Under-Secretary of State for War. (K. Rose, ‘Grigg, Edward William Macleay, first Baron Altrincham’, in H. C. G. Matthew and B. Harrison (eds), *The Oxford Dictionary of National Biography* (Oxford: Oxford University Press, 2004), vol. 24, p. 1).

2. **Jubaland**: Jubaland, also known as Azania or the Juba Valley, is now in southern Somalia. It was ceded to Italy, supposedly as a reward for the Italians having joined the Allies in the First World War. In 1926, it was incorporated into neighbouring Italian Somaliland.

3. **Tabora-Mwanza line**: The line was completed in 1928.


5. **the League of Nations**: The League of Nations, the precursor of the United Nations, was an intergovernmental organization founded in 1919 as a result of the Paris Peace Conference.

6. **Lord Selborne**: William Waldegrave Palmer, second Earl of Selborne (1859–1942), British politician and colonial administrator. In 1905, he became High Commissioner for South Africa and Governor of the Transvaal and Orange River colonies. The memorandum, dated 7 January 1907, supported the creation of a union. The document, in fact, was largely written by Lionel Curtis.
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CONSTRUCTION

As discussed in the General Introduction in Volume 1, railways in West Africa were constructed by the department system and Public Works departments (PWDs) (see Crown Agents to Colonial Office (1897); Sierra Leone (Kwalu) Railway Survey (1899); High Commissioner Sir F. Lugard to Mr. Chamberlain (1903); Papers [August 10, 1893 to August 12, 1904] relating to Construction of Foreign Railways in West Africa (1905); Mr. Lyttelton to Governor Egerton (on the Oshogbo Lagos Railway Extension, 1905); Memorandum by Mr. Churchill on Railway Construction in Nigeria (1906); Shelford, Some Features of West African Railways (1912); The Nigerian Railway [1925]; and De Frece, The Failure of Officialdom (1923), all below), in Uganda by the PWD and by Royal Engineers (see O’Callaghan, Uganda Railway; Emett, ‘Some Curiosities of the Uganda Railway’ (1901), and Memorandum for the Private Enterprise Committee by the Honourable Gideon Murray, Master of Elibank, all below), in Rhodesia and Nyasaland by private companies (see Smith Wright, Railways in Rhodesia; ‘Contract for the Construction of a Railway and Works in the British Central Africa Protectorate, dated 1897’ (1925); and Central Africa Railway Company Limited and Shire Highlands Railway Nyasaland Limited and the Crown Agents for the Colonies on behalf of the Nyasaland Government: Conditional Agreement (1930), all below), and, in South Africa, by both the private sector and the local government (see Dalton, A Report and Estimate Concerning the Construction and Equipment of a Railway between Oudtshoorn and Klipplaat (1894); Owen, Report and Estimate in Connection with Caledon Surveys (1897); and Railway Construction: Zoutpansberg District (1909), all below). Public sector construction was financed by the British government and by the Crown Agents via loans, short-term advances and private capital (see Tanganyika Territory. Proposed Loan for Railway and Harbour Development (1923–4), and Natal Government Railways. Draft Law ... To Raise a Loan for the Construction and Equipment of Certain Railways, below).

Builders of railways in Africa faced many problems, the most formidable of which was the environment. The lack of wharfage facilities made the landing of construction materials difficult and the absence of roads and paths necessitated
the use of just one base and precluded the transport of materials in advance of the railhead. Mountainous regions and those riven by rivers and streams forced the construction of expensive cuttings, earthworks, viaducts and bridges, which often collapsed as engineers were unaware of local geologies. Dense tropical forest had to be cleared at great cost and made surveying difficult, leading to poorly aligned lines. Heavy rainfall caused washouts and slips, corroded machinery, and, when combined with high temperatures, resulted in high European invalidity and mortality rates and high turnover of personnel. From 1898 to 1904, each engineering post on the Sierra Leone, Gold Coast and Lagos railways was filled by 5.45, 4.31 and 3.84 employees, respectively.¹ There was also often a shortage of ballast and water, both of which had to be transported to the rail head, and construction was occasionally interrupted by native revolt.²

A further problem was the shortage of labour (see Report of the Select Committee on Railway Labourers (1863), and Seymour, ‘Tropical Railways’ (c. 1925), below). Many areas had low population densities, and, where this was not the case, railways had to compete for workers with agriculture and mines, and, in the rainy season, often saw large numbers of labourers desert their work to cultivate family plots of land.³ Most lines also had high African mortality/invalidity rates. 2,293 labourers died in the construction of the Uganda railway, four for each mile of track laid, and 6,454 were invalided.⁴ Labourers were over-worked, provided with inadequate and poor quality food and accommodation, and were prone to mosquito and water spread diseases and accidents, there being few cost increasing safety features. Small numbers were also killed by lions and in attacks on camps by local tribesmen.⁵

In Nigeria and Kenya, labour shortages were overcome through the use of conscripted labour, largely convicts and tax defaulters. The practice, however, was not widely adopted. Forced labourers performed their roles poorly, required a great deal of costly supervision, and the policy generated African discontent and was disparaged by international humanitarian organizations, such as the Aborigines Protection Society and the Anti-Slavery Society.⁶ A more common and sustainable solution was the use of paid local and imported workers. Africans were recruited locally by colonial administrators or contractors, either individually, or, in the case of earthworks, through native subcontractors, who agreed to complete a certain amount of work for a given fee. The advantages of the system were that colonial officials, through their close relationships with chiefs, could usually source a good supply of workers, and the subcontractors, employing members of their own tribe/family, could deliver higher levels of productivity and a better quality of work than European foremen, and unlike foremen, could be easily dismissed if ineffective. The major drawback was that the practice increased labour costs (see Table 1). The subcontractors fee included
a profit margin and administrators, eager to maintain their trust relationships with the local community, ensured that the wages/fees paid were ‘fair’. Colonial officials also occasionally allowed agreements to continue even when the conditions had been broken, and, in Nigeria, stipulated that workers be paid by the day, thus increasing administration costs, and, to avoid the disruption of agriculture, be employed for only two months, which resulted in high training expenses and reduced productivity.7

Table 1: Unskilled Labour Rates in West Africa, 1904.8

<table>
<thead>
<tr>
<th>Colony</th>
<th>Rate per day (s. d.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>British construction</td>
<td></td>
</tr>
<tr>
<td>Lagos</td>
<td>1s.</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>10d.</td>
</tr>
<tr>
<td>Gold Coast</td>
<td>1s. 3d.</td>
</tr>
<tr>
<td>French construction</td>
<td></td>
</tr>
<tr>
<td>Dahomey</td>
<td>6.5d.</td>
</tr>
<tr>
<td>Kayes Niger</td>
<td>5.25d.</td>
</tr>
</tbody>
</table>

Where insufficient local labour was available, workers were imported from neighbouring regions/countries. To build the Gold Coast line, 13,000 labourers were brought into the colony, mostly from Lagos.9 In Uganda and Natal, Indian workers were employed. The Uganda railway recruited on contract 38,000 Sikhs, largely from Gujarat and the Punjab; while from 1876 to 1895 Natal first employed workers from Mauritius and then indentured Indian labourers. Indians were relatively cheap, believed to be more reliable and easier to control than indigenous labour and possessed some experience and skills, often having worked on the construction of Indian lines. On the completion of their contracts, many remained in Africa, earning their living as market gardeners, railway workers, traders and dukawallahs (petty-shopkeepers).10 European labour was only used for the construction of the 1923–5 South African Touws River–Lady-smith line; economic recession forcing the workers to take any job available. Generally, white labour was too expensive for construction and such hard physical work was regarded as the preserve of the ‘lesser’ races.

Inevitably, the harsh African environment, high labour costs and need to import railway materials and construction equipment from Britain caused construction costs to be relatively high, though they tended to decline over time. Engineers gradually learnt how to overcome many of the environmental problems faced, coastal facilities were established, labour became more skilled and the country became more open and the climate healthier as lines extended inland. Costs varied between regions. As discussed in the General Introduction (Volume 1), prior to the First World War, West African railways were relatively expensive and built to a high standard. Elsewhere, very basic low cost lines
were constructed (see Calthrop, ‘Light Railways in the Colonies’ below). Most regions had low/difficult to estimate traffic levels, lines could easily be upgraded if traffic increased, and, by keeping costs low, builders could increase the length of tracks laid expanding trade catchment areas. Low standard lines could also be constructed relatively rapidly, allowing the potential economic returns to be reaped almost immediately.11

Costs were minimized in a number of ways. Gauges, the distance between track rails, were narrow. Rather than adopt the standard or Stephenson gauge of 4’ 8.5”, most builders used a 3’ 6” gauge, known as the Cape gauge. This was relatively cheap to lay, reduced land excavation, required smaller bridges and could more easily navigate mountainous terrain.12 Others used even narrower gauges. The Uganda railway adopted a 3’ 3.5” gauge; the Sierra Leone lines and the Lagos Steam tramway one of 2’ 6”; and the South African Knysna–Deepwalls, Uganda Mombassa and Rhodesia Fontesvilla–Umtali lines a 2’ gauge, though the latter was later upgraded to 3’ 6”.13 To further reduce costs, tracks traversed the easiest terrain, often following watersheds, and, instead of avoiding hills via detours, tunnels or heavy earthworks and natural features though long radius curves, track ascended inclinations and possessed small radius curves.14 Other aspects of construction were also minimized. There were few, widely spaced and rudimentarily built stations, most of which lacked a platform, little fencing and, to avoid delays in track laying whilst rivers were traversed, river courses carrying little water in the dry season were filled with earth embankments and the water allowed to flow through iron pipes or temporary wooden trestles were constructed, both later being replaced by permanent cheap steel rather than stone bridges.15

Notes


CROWN AGENTS to COLONIAL OFFICE.
(Received August 24, 1897.)

Downing Street, London,
August 23, 1897.

Sir,

With reference to your letter of the 24th ultimo,* I have the honour to forward two copies of Mr. Shelford's report on the proposed railway to Tarquah in the Western Districts of the Gold Coast, and of a letter which we addressed to him on the 11th instant, calling his attention to certain points connected with this report, upon which it appeared to us that additional information was required. As soon as we receive Mr. Shelford's reply to this letter, we will report further on this scheme, but in the meantime it appears to us desirable that Mr. Shelford's report, which, in accordance with your desire for early information, has been prepared in anticipation of the completion of the plans and detailed estimates, and of the decision which may be arrived at in regard to the exact position of the terminus on the sea coast, should be sent to the Governor for his consideration and report.

The line recommended by Mr. Shelford, for reasons which appear to us to be sound, is one running from a point hereafter to be decided, between Sekondi and Takoradi, via Mansu to Tarquah, following very closely the existing trade route. This line is undoubtedly the shortest, cheapest and most easily maintained route for reaching Tarquah, and possesses the material advantage of being much less exposed to floods than any of the alternative routes which have been suggested. The gauge recommended by Mr. Shelford's is 3’ 6”, and having regard to the fact

* No. 172.
that this gauge has been adopted in Lagos, and that it will probably be that of the Eastern section of the Gold Coast railways, Mr. Shelford’s recommendation seems to be justified. The line is to be as nearly as possible a surface line, but in all other respects of a fairly substantial character. Its cost is estimated at 240,000l., or at about 6,000l. per mile, and it will be seen that we have requested Mr. Shelford to report whether some reductions cannot be made in this estimate without interposing difficulties in the way of subsequent development to meet increases of traffic. It must, however, be borne in mind that the ordinary tests cannot be applied to estimates of railway construction in West Africa.

As regards Mr. Shelford’s estimate of traffic, there is no doubt that the rate of 5 per cent. which he has assumed for the interest and sinking fund on the borrowed capital, may safely be reduced by 1/2 per cent., and the charges may be put at 10,800l. instead of 12,000l. This would have the effect of somewhat reducing the rate per ton per mile required to pay the working expenses and capital charges on the assumed annual load of 12,180 tons. It is, however, very desirable, as we have pointed out to Mr. Shelford, to be able to form some idea as to the prospects of this minimum traffic being obtained within a reasonable period. Much interesting information of the district will be found in Mr. Rogerson’s report, which forms an appendix to Mr. Shelford’s.

I have, &c.

M. F. OMMANNEY.

Enclosure 1 in No. 190.

Gentlemen,

35A, Great George Street, Westminster, S.W.,

August 6, 1897.

Acting upon your letter of the 31st December last, and your subsequent instructions, I advised you on the 5th of January that I had engaged the services of two engineers to make a reconnaissance survey from the coast at Takoradi Bay to the gold mining district at Tarqua. These gentlemen arrived in the Colony on the 5th of February and at Takoradi Bay on the 17th. It was recognised in my instructions that the time to make such a survey was limited by the current dry season, which was already considerably advanced, and to provide for emergencies every precaution was taken and an European doctor sent from England to accompany the expedition; nevertheless I regret to say that it was overtaken by the rains, with the result that the assistant engineer, Mr. Lines, succumbed to malarial fever, and the chief engineer, Mr. Rogerson, was attacked, as also the doctor himself, without whose watchfulness and aid the expedition would have ended in disaster.
Mr. Rogerson returned to this country on the 2nd of July, but in a condition which rendered him unfit for work up till the 26th, since which time he has furnished me with the necessary information for the following report.

It was arranged that the engineer acting for Messrs. Coode, Son & Matthews on the Gold Coast should visit Takoradi Bay, and determine upon the most favourable site for the sea termination of the proposed railway, for which three points had been selected, namely, Sekondi, Apoassi, and Takoradi Fort; and before Mr. Rogerson left Africa, he saw Mr. Coventry, and left with him the information shewn upon his survey of Sekondi, accompanied by the assurance that whatever point he might select on Takoradi Bay as most suitable for a port or harbour could be easily approached by the proposed railway.

In the meantime I received from you in April last the report and survey which had been prepared by Mr. Thomas Barham, under the direction of Sir Douglas Fox, in the year 1882, showing a proposed railway from Tarqua to Dixcove, and an alternative, recommended by him, from Tarqua to Axim. I have studied this report and survey with care, and have had an opportunity also of consulting with Mr. Barham, to whom I was introduced by Sir Douglas Fox.

Subsequently, namely, on the 10th of June, I received from you certain correspondence, accompanied by a map, forwarded by the Castle Gold Exploration Syndicate, Limited, in which was enclosed an extract from a letter from Mr. Hutchison, dated 25th of March, 1897, to which I shall have occasion to refer.

As a consequence of the above suggestions, and with a view to obtain further knowledge of the country referred to, telegraphic instructions were sent to the engineers to survey a branch line from Mansu to Kyniankor, which were carried out.

[...]

Report.

A glance at the map will show that there exists a considerable difference of opinion as to the best route for a railway to Tarqua, and as to the most suitable port out of several which may be selected; it being, of course, understood and well known that none of the places upon the coast can be considered ‘ports’ in the proper sense of the term, as they are only capable of being approached by surf boats, until some money has been expended in the construction of landing stages or breakwaters at such points as may prove suitable on investigation.

Mr. Barham’s Line.

Mr. Barham’s line from Dixcove was considered by him capable of being constructed with little difficulty for the first 17 or 18 miles beyond Tarqua, but the general contour of the ground showed that a great deal of time and labour would
have to be expended in locating it. Beyond the 17th mile very rough ground occurred and continued up to the remarkable hill known to Englishmen as the Kyniankor hill, from the town of / Kyniankor (present population only 150), which is built upon its summit. This hill presented more difficulty than any other part of the ground which was examined, consisting of a table land and ridges, with an altitude of 300 feet above the streams, and of a shape on plan said to resemble that of an octopus. This hill had a reputation among the natives of that part of the country of being richer in gold than any other on the coast, but the native workings were practically almost abandoned, as also were those at the adjoining mine of Apankan. Mr. Barham found it essential that the line should cross this country by tunnelling through one of the ridges, with a tunnel about 200 yards in length. At its northern end it would open up into a rough ravine where some comparatively heavy work would be required for about half a mile beyond the tunnel. Beyond this point and up to the River Bonsa, a distance of about nine miles along the railway, low-living places would be met with requiring banks of sufficient height to protect the railway from floods. The River Bonsa would require a bridge 150 feet span with flood waterways on each of its banks, which were found to be very low, and the floods attained a height of eight or nine feet above them.

Mr. Barham had no instructions to make a section or to take levels along this line, but it is evident from his excellent plan and report that it cannot be regarded as an easy route for the construction of a railway in an uncivilised country, where the construction of a tunnel would be exceedingly difficult, if not altogether impossible, partly owing to the want of skilled labour and the difficulty of importing it, and partly, perhaps chiefly, on account of the religious prejudices of the people.

The alternative route recommended by Mr. Barham to Axim appears to have been selected by him chiefly on account of the superior facilities and trade at that place. For 24 miles from Tarqua he found there would be no difficulties to contend with, except those due to the low level of the ground, but the bridge over the Bonsa would have to be considerably larger than the one already mentioned, and for about four miles on the northern side of the river the ground was at times very deeply flooded, and a bank at least 10 feet high would be required for almost the whole of that distance.

Leaving the Bonsa, the line would necessarily reach Axim by the valley of the Ancobra river, which in such a country would apparently involve considerable expenditure on account of the floods.

Mr. Barham very carefully inspected the country without surveying it, and concluded his report of this line by saying that he considered it quite 'certain that a good line could be constructed from Tarqua to Axim without going to the River Ancobra, and that no heavier works would be required on it than
those made necessary by the floods. It would require, in my opinion, a complete survey and section and ample information before a cheap line could be recommended under such conditions as are likely to be found where tropical floods of a large river have to be encountered.

**Castle Gold Exploration.**

*Mr. Hutchison's Route.*

The remaining alternative shown upon the plan appears to have been suggested by Mr. Hutchison, who enclosed with his letter of the 25th of March last a sketch map showing the route under survey by Mr. Rogerson, to which he objects on the ground that the chosen harbour is too small to admit a ship, the route selected is very hilly, and will be much prolonged by following the sinuous course round the bases of the hills. In reply to this it may be said that the choice of a harbour has been left with your consulting engineers for harbours to determine, and that I am not aware of any harbour on that coast which will admit a ship, and that the route selected is proved by surveys to be shorter than that of the existing road, after allowing for sinuosities. On the other hand, the line sketched on Mr. Hutchison's tracing [...] increases the distance between Takoradi Bay and Tarqua by at least 10 miles.

Mr. Hutchison continues by saying that he has marked upon his map the eastern limit of the gold-fields, and that the proposed line runs outside such limit. He admits, however, that there are ‘sporadic reefs’ in that country, and it will be seen that the Ebenezer Gold Mines (which are working) are amongst such reefs, whilst the mines marked on the map within his limit are believed to be practically abandoned. / *Proposed Railway as surveyed by Mr. Rogerson.*

Mr. Rogerson's report on this line is appended hereto (see Appendix A.), [...]. His survey, which was carefully made to a scale of 12” to a mile, and the levels, which he has taken instrumentally, show that the country is adapted to the construction of a railway. It is comparatively free from water and is of such a character that a line can be carried through the hills without recourse to steeper gradients or sharper curves than can be effectively worked with the rolling stock of the type which is already in use upon the Lagos Government Railway.

Having carefully studied the questions of railways both in Sierra Leone and Lagos, as well as between Appam and Insuiam, I am of opinion that in this case the gauge should be 3’ 6”, the steepest gradient 1 in 50, and the sharpest curve should have a radius of five chains (only to be used where absolutely necessary). This curve will admit of a speed of 15 miles per hour. I would suggest that the rails should have a weight of 50 lbs. per yard, and that steel sleepers should be employed, except where the soil may be impregnated with salt, in which case
Communications in Africa, 1880–1939: Volume 2

hard wood timber sleepers may be used. The length of the railway will be 39 miles 3 furlongs, which compares with 40 miles by road.

I estimate that the cost of such a line will be covered by the capital expenditure of 240,000l., exclusive of the port.

I have no hesitation in saying that the line surveyed will be less exposed to risk from floods, both in construction and maintenance, and will be less costly than any other of the routes suggested, and to which I have already referred. It appears to me also to be the most likely one to accommodate the trade of the district, for the following reasons:–

(1.) Because it follows the line of the main road from Chama to Tarqua.

(2.) It does not appear to come into competition with the water navigations of the country by which the port of Axim is supplied with timber and other exports.

(3.) It passes through the centre of the concessions of the Abanta Company, Limited, which are now being worked, and extend over an area of 162 square miles.

(4.) The present course of trade seems to indicate that the natural products of the country, such as palm-oil and kernels, find their outlet at Chama, which is close to Sekondi, and not at Axim, and that general supplies which go to the gold mines of Tarqua find their entrance at the same place, and along the route of the proposed railway.

(5.) Lastly, all the information which has been obtained points to the conclusion that the great development of gold-mining, both at present and in the near future, is at Tarqua and beyond, and that it is important, therefore, to reach that point by the shortest, cheapest, and most easily maintained route, which the one selected proves to be.

Mr. Rogerson’s survey of the branch line from Mansu to Kyniankor is not yet completely plotted. It does not appear to afford the best route to the latter, but to be favourable for the accommodation of the Ebenezer gold field, which is working, and lies upon the route. He is of opinion, however, that a sufficiently good light railway may be made, when required, to Kyniankor.

Working.

It is estimated that the passenger traffic will be sufficiently accommodated by attaching passenger cars to the freight trains, by which the revenue will be chiefly earned. The cost of working a railway in a Colony where there is no experience of railways is very difficult to estimate with accuracy, but experience now seems to show that the Natives will be competent under some European supervision, and on this basis the cost of working the whole length of 40 miles with two trains per day (one each way), for six days per week, should be covered by an annual expenditure of 10,798l., and the cost of working with four trains per day (two each way) should be covered by 13,758l., whilst the maximum net tonnage
estimated to be carried will be 26,666 tons, and 53,332 tons, respectively, which, if the average distance hauled be taken at 30 miles, will be equal to a cost of 8s. 7d. per train mile and 3.24d. per ton mile, or 5s. 6d. per train mile, and 2.06d. per ton mile respectively. / 

_Passengers._

In the above figures the passenger traffic has been disregarded, but the figures will apply if five passengers are substituted for one ton of goods.

_Traffic required._

The annual charges for interest and sinking fund upon the capital expended upon the railway, if estimated at 5 per cent. on 240,000l., will be 12,000l. per annum, and the total annual charges to be covered as soon as the railway is completed will thus be:–

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working expenses, two trains per day (one each way)</td>
<td>10,798</td>
</tr>
<tr>
<td>Interest on capital and sinking fund</td>
<td>12,000</td>
</tr>
<tr>
<td>Total</td>
<td>22,798</td>
</tr>
</tbody>
</table>

And the gross earnings from the traffic should equal this amount. If it is found that two trains per day will not carry the traffic, which may happen soon after the opening of the railway, the working expenses, and therefore, the gross earnings, must be increased by the cost of the additional trains, as follows:–

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working expenses, four trains</td>
<td>13,758</td>
</tr>
<tr>
<td>Interest on capital and sinking fund</td>
<td>12,000</td>
</tr>
<tr>
<td>Total</td>
<td>25,758</td>
</tr>
</tbody>
</table>

It may be assumed that the railway will be earning its working expenses from the first, inasmuch as there is already a good nucleus for traffic at Tarqua, and no train need be run except at rates sufficiently remunerative to cover the working expenses at least.

Mr. Rogerson points out in his report (Appendix A.) that the cost of delivery of the goods at Tarqua is increased by the transport from the sea coast by as much as 33 per cent, as a minimum, and even reaches 100 per cent., and the actual cost to the mining companies of transport between the coast and Tarqua is equal to 11l. per ton, or 5s. per ton per mile. Assuming then that the present rate is reduced to one-fourth by the construction of the railway, equal to 1s. 3d. per ton per mile, the railway will pay its working expenses and interest on capital charges with an annual load of 12,180 tons with an average haul of 30 miles in two trains per day.

This exceptional rate will only apply at the outset, for when the traffic requires four trains per day, which will carry 53,332 ton per annum, the working expenses and capital charges will be covered by an average rate of 4d. per ton per mile.
Traffic available.

Mr. Rogerson’s report shows that the country is ripe for the development which the construction of a railway will bring about, and the experience now gained of the West Coast encourages the belief that where there are natural products available for export, as in this case, they can be profitably carried by railway at a great reduction upon the present cost, and where gold mines exist in an active condition, as at Tarkwa and beyond, the export trade will certainly be supplemented by a valuable traffic in imports.

The tables appended to Mr. Rogerson’s report indicate that while the value of the exports from Chama (the present outlet from Tarkwa) had been much less in 1896 than in the previous years (which he satisfactorily accounts for), the value of the imports at the same place had steadily increased during the corresponding period, which is a very hopeful sign and supports the view that the country is ready for a railway.

The value of the exports and imports from the shipping places of Axim, Dixcove, and Chama which dispose of the produce from the districts to be served by the railway amounted in 1896 to:–

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imports</td>
<td>115,546</td>
</tr>
<tr>
<td>Exports</td>
<td>111,525</td>
</tr>
<tr>
<td>Total</td>
<td>227,071 /</td>
</tr>
</tbody>
</table>

which represents the value at the coast after the exports have been charged with the cost of transport, but before the imports have been so charged.

Having regard to the rapid rise in the value of imports at Chama, it is not too much to assume that when the railway is constructed they will reach such proportions as will justify the expenditure.

The plans and detailed estimates of the proposed railway are not yet completed and wait the report of Messrs. Coode, Son, and Matthews on its termination.

I have, &c.

W. Shelford.

To the Crown Agents for the Colonies,
Downing Street.
APPENDIX A.

Report of Mr. R.G. Rogerson, who made the Survey.
35A, Great George Street, Westminster, S.W.,
August 6, 1897.

The proposed railway would commence at the Bay of Sekondi, where there is an excellent site for the construction of either a pier or breakwater, on a small projecting reef of rocks running out north easterly, offering a protection to the bay, which is always exceptionally free from surf; and where no difficulty is ever experienced in landing from canoes. The foreshore is sandy, the anchorage good, and the officers of the British and African Steam Navigation Company, Limited, state that they would not hesitate to bring their ships to the end of the pier if constructed.

If a breakwater was constructed instead of a pier, a harbour would be made in which steamers and small vessels could lie in smooth water, but a landing stage under its protection would still be necessary to receive cargo from barges or lighters.

Sekondi is situate in the Province of Chama, and is the most important town between Chama and Axim. It contains a population of 2,500. There is a large fort (Fort Orange), in an excellent state of repair; the town contains a chapel, school, and about 260 houses. The occupation of the inhabitants is chiefly fishing; but large quantities of palm oil and kernels are brought down from the interior and exported from here.

From Sekondi, the line runs in a north-westerly direction, passing through the following villages, viz.:–

Approximate Population.
Kudjoe Kroome 31
Darkoo Kroome 26
Ando or Annoe 228
Ashieme 230
Mansu 200
Ponasi 20
Cheche Kroome 20
Bensu 100
Essuasu 151
Abuadji Kroome 22
Essekuma 110
Bansu 216
Ando, Ashieme, Mansu, Bensu, Essekuma, and Bansu are the most important agricultural villages on the route.

The soil of the country is remarkably fertile, and food, plants, fruits, and trees of various kinds grow luxuriantly on it. Among the food plants are yams, corn, plantain, cassava, cocoa-yam or eddoes, pepper, ground nuts, okros, garden eggs, and other garden vegetables. Maize and plantain is the principal food of the natives. Cassava, like yam, is a universal food.

Rice is not grown in this district but is largely imported.

In the district traversed by the railway are to be found oranges, limes, pineapples, bananas, 'papaws,' mangoes, tiger nuts, &c. None are properly cultivated, but grow wild, and all are of poor quality, with the exception of the orange, Chama and Sekondi being noted on the Gold Coast for the quality of their oranges.

Timber.

With regard to the timber on the route of the proposed railway, it is not only abundant, but practically inexhaustible, and the major portion of it is most valuable.

The Ahanta Company, Limited, hold concessions of over 160 square miles to cut timber, &c.; they have a staff of officials and Krumen at present felling timber on their concessions, which is waterborne to the sea for shipment.*

The following are the names and the descriptions of the principal timbers growing in the Ahanta and Wassaw districts:–

- Barkoe: Various trees of the mahogany class, 1 foot to 3 feet in diameter; rot and insect proof.
- Dubini
- Paenkwa
- Kusaba
- Cedar: Scented mahogany.
- Kwabohol: Beautiful wood, suitable for wainscotting, &c.; grows to 6 feet diameter.
- Danta: Hard wood, deep red in colour; grows 1 foot to 4 feet in diameter.

* The Ahanta Company are now, and have been for the last four or five years, exporting large quantities of mahogany and other valuable timbers to Great Britain; they have laid down on their concessions a portable light railway to expedite the transport of heavy timbers. As will be seen on the map, the proposed railway passes nearly through the centre of their immense concessions.
Embil Good for building purposes; largely used for beams; rot and insect proof and grows to 3 feet diameter.

Effram
Oprun
Kanwin Boxwood.
Achin Grows to 18 inches diameter; rot and insect proof.
War-War Grows to 6 feet diameter; canoes are made from the trunks of these trees.
Dubimah Grows to 1 feet diameter; rot proof.
Odoom Grows to 6 feet diameter; rot and insect proof.
Subahah Grows to 2 feet diameter; rot and insect proof.
Cacho (ironwood) Grows to 5 feet diameter; raw beef colour when full grown; rot and insect proof.

N.B. – This information as to timber was supplied by Mr. R. J. Nicholas, general manager of the Ahanta Company, Limited.

From Chama, mahogany was exported to England as per the following table, viz.:–

<table>
<thead>
<tr>
<th>Year</th>
<th>Cubic Fed.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1894</td>
<td>1,416,852</td>
<td>34,976 4 2</td>
</tr>
<tr>
<td>1895</td>
<td>630,573</td>
<td>5,495 17 0</td>
</tr>
<tr>
<td>1896</td>
<td>465,106</td>
<td>3,871 12 0</td>
</tr>
</tbody>
</table>

It will be seen that the export of mahogany shows an extraordinary falling off, and this is attributed to the exceptionally dry seasons of 1895 and 1896, there not being sufficient water in the rivers to float the timber down to the sea. The construction of a railway would remedy this, as transport could be carried on continuously.

The oil palm is not cultivated to any great extent, and on several occasions I noticed the fruit had fallen from the trees and was allowed to rot, as the difficulty and cost of transport to the coast was too great, and this also interfered with its successful and general cultivation.

The cocoa-nut tree abounds on the coast, and almost all villages on the route are partially surrounded and sheltered by these trees.

Rubber:

The rubber industry has recently developed, and a company has already been formed for the collection and gathering of rubber in the districts through which the proposed railway will pass.

The Colonial Rubbers Estates Company, Limited, in their prospectus state: ‘The territories are in the Gold Coast Colony and are thickly covered with rubber trees and vines. The shipping ports of Axim, Chama, Sekondi and Butri, are
available for export.’ [...] the whole of this traffic to these ports will be intercepted by the construction of this railway and it may be assumed that this rubber to some extent will pass over it as traffic. The Company estimate that it is possible to gather between 200 and 300 tons of rubber per annum.

Manufactures, Mines, &c.

No manufactures of any importance are carried on by the Natives.

At Sekondi, fish curing in ovens and by sun drying is carried on for export into the interior, and daily large numbers of carriers are to be met transporting dried fish into the interior.

Earthenware pots of various sizes for carrying and storing water for household purposes may be seen in process of manufacture in different villages by the Natives for their own use.

Mines.

At Tarqua are the first mines met on the route where machinery is employed, belonging to the Tarqua and Abosso Gold Mining Company, Limited, who hold concessions for 4,000 acres of land with full rights to all mineral, timber and water. This Company, originally the African Gold Coast Company, was taken over by the Société Fermière des Mines d’or de Taquah and d’Abosso (capital 1,600,000 francs), incorporated 1876.

The mines and properties belonging to the Company are situate at Tarqua, Abosso, River Ankobra, Mankooma, Tamso, Sanhoman, Makata, Akasenoe, Usupranto, Insimankaw, Assoma-Assi, Afcfama-Appim, Mirekety Kita.

The mines and properties belonging to the Company are situate at Tarqua, Abosso, River Ankobra, Mankooma, Tamso, Sanhoman, Makata, Akasenoe, Usupranto, Insimankaw, Assoma-Assi, Afcfama-Appim, Mirekety Kita.

Prolongation of River Mankooma and allkuvials, Eweaboo, Tuappim, Peta-boo, Tintinaah.

The Taquah and Abosso Gold Mining Company, Limited, was incorporated on May 26th, 1888, with an authorised capital of 100,000l. was offered for subscription. This Company which took over the French Company, have now batteries at work at Tarqua and Abosso containing 43 stamps, the majority being 750 lbs. in weight. The present crushing is 1,600 tons per month and when the new machinery which is in course of transit is erected, this quantity will be doubled.

The mine has five shafts of various depths, the deepest being 115 feet vertically or 240 feet on incline. Levels 407 feet long on one side and 170 feet on the other are driven and opened out on each side of the shaft.

The reef of gold veins, called fissure veins, dip at an angle of about 32 degrees and vary in thickness from 2 feet to 6 feet and in value from 10 dwt. to 3 oz. per ton. Rock drills worked with compressed air are used.
The ore after being raised is pulverised in the batteries and the gold extracted by amalgamation on copper plates.

The machinery in use consists of nine steam boilers, six engines and eight steam pumps. The boiler capacity equals 200 horse-poers, they work night and day, Sunday included.

Five hundred to six hundred cords of firewood at a cost of 10s. per cord are consumed monthly (1 cord = 128 cubic feet). The working of the mines since 1879 has exhausted the timber in the immediate vicinity of the mines and the cost of transport yearly becomes greater, some thousands of cubic feet of timber being consumed annually in propping.

The average number of men working at the mines and in connexion therewith is 1,500.

During the year 1896 there was transported from these mines to Axim 6,087 ounces of gold bullion, value 23,373l. 4s. 4d., and from Axim to the mines, 38 cases of silver / specie, value 8,200ll., and 12,044 packages of stores, &c. weighing 341 tons. The latter cost:–

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landing at Axim</td>
<td>153 0 0</td>
</tr>
<tr>
<td>From Axim to Bonsa Station (nearest river point to Tarqua)</td>
<td>2,615 0 0</td>
</tr>
<tr>
<td>From Bonsa Station to Tarqua</td>
<td>1,200 0 0</td>
</tr>
<tr>
<td>Total cost of transport in 1896 equals</td>
<td>3,968 0 0</td>
</tr>
</tbody>
</table>

This equals 11. 3s. 9d. per ton for transport from Axim to Tarqua. (Exclusive of landing charges at Axim) Twenty tons of mining stores and one ton of dynamite are used monthly.

During the quarter ending 31st March 1897, 4, 156 packages of mining stores, machinery, provisions, implements, &c. were landed at Axim, weighing 99 tons, but owing to the River Ancobra being very low, the greater part of the stores are yet on the river (April 1897).

Five cases containing 1,636 oz. bar gold have been sent to Axim, and 14 cases containing 3,200l. of silver coin have been received.

The average time occupied in transport from the ship at Axim to Tarqua, is three weeks to one month, and the quickest time 10 days.

A surf boat will carry up the river between Axim and Bonsa station in the wet season two tons, and in the dry season half-a-ton a part of the way, when the cargo is transferred to canoes, which can only get two-thirds of the way up.

For three months in the year transport on the Ancobra is practically at a standstill, the water being too low.

The manager of these mines informed me that if this railway was constructed, he would double his machinery and plant, and substitute for the present small Roots boilers burning wood, large Lancashire or Cornish boilers burning coal, the transport of the coal from the coast adding to the traffic of the line.
Adjah Bippo is situated 7 miles N.N.E. of Tarqua, and is approached the whole way by a valley along which the construction of a railway would be very simple, light, and cheap.

Here, at Adjah Bippo, are the gold mines of the Wassau (Gold Coast) Mining Company, Limited, covering an area of 930 acres, and 1 1/2 miles northwards is the Cinnamon Bippo mine, area 820 acres, owned by the same company.

At Adjah Bippo the mine is worked by three shafts, called the Swanzy, Cleaver, and Bishop shafts.

The Swanzy shaft is now 184 feet deep, and it is proposed to sink until 250 feet is reached, which will render 20,000 tons of ore accessible, estimated to contain fully 160,000l. worth of gold.

The Cleaver shaft, which is the winding shaft of the mine, is now 150 feet deep, and is being sunk to open up another level at 200 feet.

The Bishop shaft is at present 212 feet deep, and it is proposed to lower this to 263 feet.

The milling machinery consists of 22 head of stamps, made up of a 10-head battery of 750 lbs. weight per stamp, and a 12-head battery of 550 lbs. per stamp, driven by a 76 h.-p. engine. Preparations are in progress for the addition of another 10-head battery of 750 lbs. stamps.

This company has 5,000 acres of property covered with timber, consisting of mahogany, cedar, African oak, ironwood, &c., in great quantities.

Cinnamon Bippo mine is a new property with about 600 fathoms of proved reef. Five adits were started in August last, and within the boundary of these adits, the estimated quantity of ore available for extraction is 34,000 tons, containing about 70,000l. worth of gold.

At this mine there are 16 stamps erected with all the other machinery nearly erected, but the company have abandoned the works, and they remain idle and incomplete, as the company found the cost of transport of machinery so enormous.

A light line of railway 20 inches gauge (16 lbs. rail), and 1 miles long, has been constructed from this mine to Adjah Bippo, for ore, fuel, and timber transport.

I believe it was the intention of this company to have continued this line through to the Ancobra river for the transport of material, but the manager received instructions to suspend operations in view of this proposed Tarqua railway being constructed.

At Adjah Bippo mine, 600 cords of wood are used monthly at a cost of 12s. per cord, and great difficulty is experienced in even obtaining this quantity, and the distance of transport daily becomes greater.
The total power of the boilers here in 186 1/2 h. p., and at present 105 h.p. boilers are laying at Axim waiting for floods to be floated up to Bonsa Station, which is situated about 21 miles from these mines.

Small articles up to 56 lbs. in weight cost 4l. per ton to transport this distance, but heavy pieces of machinery, say of 5 cwt., cost 16l. per ton.

Transport from Chama to Tarqua costs this company 15s. per 100 lbs. weight, and they add 33 per cent. on to the cost of provisions at the coast, at which price they supply their own men only.

Traders and 50 per cent. to 100 per cent. on to all articles for sale.

Six hundred native men are employed in the mines here at present, there being only six imported labourers, of which two are Europeans.

No difficulty is experienced in obtaining native labour, except occasionally in the rainy season, when the men go to their farms. Imported labour is then employed.

The health of the natives is generally good, and that of Europeans good.

Water is plentiful.

The amount paid by this company for transport in 1896 for stores, &c. from Bonsa Station to Adjah Bippo = 962l. 13s. 1d., and the weight under 90 tons.

Gold remitted to England, 1895 13,438 7 10
Gold remitted to England, 1896 23,606 11 8

*Engineering Notes on proposed Railway.*

The total length of the line is 39 miles 3 furlongs from Sekondi to Tarqua, and by the existing path 40 miles.

No heavy initial outlay will be necessary at Sekondi before this line would be commenced.

There is abundance of land available for goods’ yard, the erection of warehouses and custom house, &c.

The line as laid out is practically a surface one, no rock is met with, the curves are generally easy, and in the worst cases are within the prescribed limit; the gradients are also light and within the limit assigned to them.

No viaducts are necessary, and only four rivers, viz., the Annangkon, 40 feet wide, Ben, 45 feet wide, Bonsa, 69 feet wide, Bonsawia, 42 feet wide, are crossed. There are, however, several other waterways in which water flows during the rainy season only.
**Seaward Terminus.**

It having been suggested that Takoradi or Apoassi might form a suitable point for the commencement of the railway, I examined and surveyed the whole of the foreshore between Sekondi and Takoradi, and also the intervening country, for some distance inland.

Mr. Coventry, the representative of Messrs. Coode, Son, and Matthews, arrived in the Colony in June last with a view of examining Sekondi and Takoradi Bays, and reporting upon the best position for a pier or breakwater. At his request, and upon instructions received from Mr. Shelford, I supplied him with a plan of Sekondi showing the bay and the position and direction of the railway as surveyed, together with all the information he required respecting the district generally.

I also informed him that, if any point between the two bays above-mentioned was selected for a pier, there would be no difficulty in approaching the same with a railway.

Mr. Coventry has not yet returned to this country, so that his report is not available.

**General.**

The introduction of a railway into this part of the Colony, viz., Wassaw, would be hailed with great satisfaction by the traders at Sekondi, the King and various Chiefs of Wassaw, who have been consulted, and who are anxious to find native labour for constructional work, the gold mining companies at Tarqua, Abosso, and Adjah Bippo, which are labouring under great transport difficulties, and the various English and native companies who hold concessions all along the line for the cutting down and export of timber and the extraction of minerals. / Several companies are waiting for the construction of this railway before ordering and erecting stamps, mills, &c. Gold has been proved, and is known to exist from Tarkwa to within 4 miles of Sekondi.

It is impossible to estimate with any amount of accuracy the probable amount of traffic likely to be developed by a new railway in a Colony like this, but the valuable timber forests that exist for hundreds of square miles are sufficient in themselves, if developed, to keep the railway employed for some years.

The conveyance of machinery, stores, and coal from the coast to the Tarqua gold fields should give a considerable revenue, and also the conveyance of food and manufactured articles from the coast to the interior, which are at present carried by Natives.

N.B. – The average number of carriers met daily on the road between Chama and Tarqua numbered 90.

The population of Eastern and Western Wassaw is 73,683.
Exports.

The principal exports from Wassaw, and which this railway would transport, are:-

- Kola nuts
- Gold dust
- Gold copal
- Timber
- Monkey skins
- Palm kernels
- Palm oil, and
- Rubber

From Axim, Chama, and Dixcove, in 1896 these articles were exported to the value of 111, 525; 11s. 10d.

Imports.

In 1896 there was imported at the same ports goods to the value of 115, 546l. for transmission to the immediate interior, and it may be assumed that if a railway was constructed and a port formed at Sekondi, such imports would be conveyed by railway instead of native carriers as at present.

Statement showing the total value of Imports and Exports of the under-mentioned Ports on the Gold Coast Colony for the years 1894 to 1896, from information supplied by the Comptroller of Customs, Accra.

Imports.

<table>
<thead>
<tr>
<th>Ports</th>
<th>1894</th>
<th>1895</th>
<th>1896</th>
</tr>
</thead>
<tbody>
<tr>
<td>£</td>
<td>s. d.</td>
<td>£</td>
<td>s. d.</td>
</tr>
<tr>
<td>Axim</td>
<td>52,301 3 10</td>
<td>62,492 13 8</td>
<td>94,194 8 1</td>
</tr>
<tr>
<td>Dixcove</td>
<td>14,925 5 9</td>
<td>12,288 5 4</td>
<td>9,985 9 6</td>
</tr>
<tr>
<td>Chama</td>
<td>6,661 5 9</td>
<td>8,651 7 10</td>
<td>11,361 9 2</td>
</tr>
<tr>
<td>Total</td>
<td>73,887 15 4</td>
<td>83,432 6 10</td>
<td>115,546 16 9</td>
</tr>
</tbody>
</table>

Exports.

<table>
<thead>
<tr>
<th>Ports</th>
<th>1894</th>
<th>1895</th>
<th>1896</th>
</tr>
</thead>
<tbody>
<tr>
<td>£</td>
<td>s. d.</td>
<td>£</td>
<td>s. d.</td>
</tr>
<tr>
<td>Axim</td>
<td>72,163 9 2</td>
<td>67,675 17 0</td>
<td>86,386 9 4</td>
</tr>
<tr>
<td>Dixcove</td>
<td>20,826 19 11</td>
<td>19,948 19 7</td>
<td>14,928 18 10</td>
</tr>
<tr>
<td>Chama</td>
<td>47,893 7 8</td>
<td>18,893 7 2</td>
<td>11,210 3 8</td>
</tr>
<tr>
<td>Total</td>
<td>40,883 16 9</td>
<td>106,518 3 9</td>
<td>111,525 11 10</td>
</tr>
</tbody>
</table>

R.G. Rogerson. /
Enclosure 2 in No. 190.
Crown Agents to Mr. Shelfobd.
Downing Street, S.W.,
August 11, 1897.

I have acknowledge the receipt of your letter of the 6th instant, enclosing your report upon the Tarquah Railway Survey, and shall be obliged if you can furnish us with further information on the following points:

1. On the 6th page of your report you give the estimated cost of the line at 240,000\(\text{\pounds}\), exclusive of works at the harbour or port. This is equal to 6,000\(\text{\pounds}\) per mile, which appears to us to be very high for a line which is practically a surface line, constructed through a country presenting no engineering difficulties and no considerable waterways. You state in your covering letter that a cheaper line could be worked out from the present plans and sections, and as 6,000\(\text{\pounds}\) per mile is undoubtedly far in excess of any expenditure hitherto contemplated by the Colonial Government on this line, I should be glad if you would state in what direction you would propose to effect reductions, and what would be the cost of the cheapest line you could recommend in this instance.

2. As regards the proposed route, we concur with you in thinking that if it is clear that the development of gold mining is to be looked for at Tarquah and beyond, the route selected by Mr. Rogerson best satisfies the conditions of the problem. It is, however, not equally clear to us how Mr. Rogerson proposes to serve the Kyniankor District by means of what is described as a sufficiently good light railway. If he has in view a branch from the main line to Tarquah it is, in our opinion, imperative that however light that branch may be in construction, it should be of the same gauge as the main line.

3. In regard to the estimate of traffic required on page 8, we observe that the conclusion at which you arrive is that with an annual load of 12,180 tons, with an average haul of 30 miles, and two trains a day, at a rate of 1s. 3d. per ton per mile, the railway will pay its working expenses and the interest on the capital charges, and we agree with you in thinking that, having regard to the existing cost of transport, it might be possible to impose this rate until the growth of traffic justifies its reduction. But the point which is not clear to us, and which we have not been able to find explained in your report, is how far we should be justified in expecting this annual traffic of 12,180 tons. While giving full weight to your arguments as to the prospects of future development, it would be satisfactory to know that the existing traffic in the district bears some reasonable proportion to this minimum traffic of 12,180 tons.

[...]

I am, &c.

M. F. Ommanney.
Sierra Leone (Kwalu) Railway Survey. Report of Messrs Shelford and Son (15 November 1899); held at the National Archives, CO 879/61/612.

SIERRA LEONE.

SIERRA LEONE (KWALU) RAILWAY SURVEY.

REPORT OF MESSRS. SHELFORD AND SON, DATED 15th NOVEMBER 1899.

35A, Great George Street,
Westminster,
15th November 1899.

SIERRA LEONE (KWALU) SURVEY.

Extension beyond Rotofunk.

Gentlemen,

In accordance with the instructions contained in your letter of the 18th November 1898 to Mr. Shelford, and subsequently, we have the honour to report that after considerable delay from various causes we have now completed the investigation of the above extension, the principal loss of time being due to the necessity for postponing our conclusions as to the traffic prospects of the line until further statistics had been obtained from the Colony, which arrived on the 17th October last.

2. It is necessary to explain, in the first place, that after the expedition had started it was desired to make an alteration in the direction of the survey near Rotofunk, and at the request of His Excellency the Governor, Sir F. Cardew, 1 contained in his despatch of the 15th February last, it was arranged that Kwalu should be avoided, and that the line should be diverted so as to run direct to
Mano via Moyamba, to which latter place the head-quarters or seat of Government of the Ronietta district, which had been hitherto at Kwalu, were about to be removed. The alteration was duly authorized by Mr. Chamberlain, and signified to us in your letter of the 10th March last, and the survey was carried out on the lines suggested as far as Mano and Bo.

3. We beg to refer here to the despatch of His Excellency, dated Freetown, 4th October 1898, in which he expresses his reasons for the survey. He there stated, in paragraph 3, that the preliminary surveys beyond Rotofunk should be made during the then ensuing dry season in order that the location and final survey might be twelve months ahead of construction, which would mean a great saving in time and cost. In paragraph 4, he considered that he need hardly dwell on the necessity for the extension of the railway if it was to be a remunerative undertaking, or the advantages which must result from the development of the Protectorate by means of the railway, which would run through districts that were fertile and prolific in the extreme, in such products as palm oil, palm kernels, rubber, gum, and kola nuts, a large portion of which was going to waste through the want of a ready market. In paragraph 5, he deduced from the traffic returns of the line already opened that there was little doubt that the railway would pay its working expenses, and that as it is extended and the traffic increases from the development of the country, the interest and sinking fund on the capital invested would also be paid.

To the CROWN AGENTS for the COLONIES, Downing Street, S.W. /

In paragraph 6, he pointed to the great advantage which this line possesses over that of any of the other colonies on the West Coast, in that it has for its terminus a large city and a port which is believed to be a greater emporium of trade than any other single port on the coast, and, further, that it has a hinterland through which to pass, which, though limited in extent, was rich in products and capable of great development, and was not dependent on trade from the interior, as was shewn by the increase in the value of the imports and exports of the colony in recent years, notwithstanding that the trade of vast territories on the Niger had been cut off by the French. He then drew attention to his experience of the usefulness of the railway for military purposes during the crisis of the disturbances in April 1898 – i.e., twelve months before it was completed – and concluded by urging its continued extension on military and political grounds.

4. Having had the honour of an interview with His Excellency on the 18th September last, just before his departure for the Colony, we are well aware of the opinions which he holds, and which we may say are even stronger now than when he wrote the above despatch. They may be summed up in his own words, that ‘the further the line goes, the better it will pay.’
5. In consequence of His Excellency’s despatch, we received through you, on the 27th December last, the approval of the Secretary of State, and a special survey party, consisting of Mr. F. S. B. Gaffney, as Senior Engineer, Mr. A. Summerscale, as Junior Engineer, and Doctor W. B. Mercer, as Medical Officer, was engaged and sent out on the 7th of January of the present year. These gentlemen made a reconnaissance survey from Rotofunk to Pehwahun (31 1/4 miles), a point suitable for a station, and estimated to be the same distance from Rotofunk as the town of Kwalu, the limit to which, as already explained, had been abandoned. They also made a flying survey, or exploration of the country, towards Mano, and thence to Tikonko, which was the southernmost objective mentioned in their instructions. Returning northwards by way of the very important towns of Mattru and Bo, and thence to the westward via Mano and Kwalu, they completed the exploration of the country, which resulted in fixing the general direction of the line [...].

6. Mr. Gaffney, who was on leave from the Straits Settlements, where he holds a Government appointment, has supplied us with a report (see Appendix A) in which he has given a full description of the country and his general views as to its population and traffic prospects; and Mr. Summerscale, who is a gentleman of considerable practical experience in surveying for and constructing railways, both at home and abroad, confirms the opinion of Mr. Gaffney as to the practicability of making an easy line and the absence of engineering difficulties.

7. It may be said generally that from Rotofunk, the starting point of the proposed extension, to Moyamba, a distance of 22 miles by railway, the country is not more difficult than that between Songo town and Rotofunk, but that beyond Moyamba the prospects are more favourable for an easy line on account of the absence of hills and greater freedom from bush and other obstacles.

[...]

9. It is believed by the resident engineer that the latter section (to Rotofunk) will be ready for opening or at least for the working of construction-trains by the middle of 1900, which is earlier than had been anticipated.

If this is realised it will be due to the circumstance that advance parties of surveyors were early in the field, who were allowed time to locate the railway in the most advantageous position, thereby saving the cost of some earthwork and of two expensive viaducts, which had previously been thought unavoidable, and it is very desirable that the remainder of the railway should be treated with similar forethought, in order to secure by a good location the great advantage of economy in the construction of works.
MR. GAFENY’S REPORT (APPENDIX A).

10. This report describes the work done by the surveyors, the routes traversed, the country passed through, and the works required. Mr. Gaffney has drawn attention to the abundant evidence of population which he met with throughout the country, notwithstanding that it was temporarily very much reduced by the disturbances following upon the ‘Hut Tax Revolt.’ He has also commented upon the traffic prospects of the line when extended, and has given his views upon the desirability of pushing forward such extension by laying the rails and sleepers rapidly as a temporary road before finishing the works intended to carry the permanent way.

11. The ‘reconnaissance survey,’ which extended for a length of 31 1/4 miles to Pehwahun, proved to the surveyors that some care would be necessary in order to locate a surface line through a country so undulating and varied. Accordingly cross sections were taken from which levels and contour lines were drawn upon the plan, and thus a favourable route was obtained.

12. The remainder of the route, the choice of which resulted from the ‘flying surveys’ fully described in his report and already referred to – i.e., from Pehwahun to Mattru and Bo – is much easier, and the only works of importance are the crossings of three or four rivers for which iron or steel bridges will be required, but of moderate dimensions, and in no case equal to that now being constructed over the River Ribbi on the extension to Rotofunk.

13. The names of the principal places along the line finally selected, and their distances from each other and from Freetown, are shewn in the following table:

<table>
<thead>
<tr>
<th>SIERRA LEONE (KWALU) SURVEY.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lengths.</strong></td>
</tr>
<tr>
<td>—</td>
</tr>
<tr>
<td>Freetown – Songo Town</td>
</tr>
<tr>
<td>Songo Town – Rotofunk</td>
</tr>
<tr>
<td>Rotofunk – Pehwahun</td>
</tr>
<tr>
<td>Pehwahun – Mattru</td>
</tr>
<tr>
<td>Mattru – BO</td>
</tr>
</tbody>
</table>

14. The above are the most natural divisions into which the line falls for construction purposes, excepting Mattru to Bo, but as the really prolific country does not occur until Mano is reached, it will be convenient in this Report to consider the whole of the extension to Bo as being alternatively – from Rotofunk to Mano (50 1/4 miles) and Rotofunk to Bo (80 1/2 miles).
15. The following is an estimate of the cost of the line from Rotofunk to Pehwhahun (31 1/4 miles), based upon the standard works of the constructed line, and calculated at prices in accordance with the present market rates. The net result is a cost of £4,429 per mile exclusive of rolling stock, and £4,733 per mile including rolling stock. The data for the remainder of the extension supplied by the ‘flying survey’ are not sufficient to make an estimate upon, but they have established the fact that the above mileage estimate will be more than sufficient to continue the standard line to the most distant point – Bo, the total cost of which from Rotofunk to Mano (50 1/4 miles) will be £237,833, and from Rotofunk to BO (83 1/2 miles) £381,006.

SIERRA LEONE (KWALU) SURVEY, 1899.

ROTOFUNK TO PEHWAHUN.

Located by Reconnaissance Survey. Length, 31 1/4 miles.

Estimated Cost on Sierra Leone Standard (2 ft. 6 in. Gange).

<table>
<thead>
<tr>
<th>Cost per mile.</th>
<th>Heads and Sub-heads of Estimate.</th>
<th>Amounts.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£ Preliminary Expenses:–</td>
<td>£</td>
</tr>
<tr>
<td>48 Reconnaissance Survey in 1899</td>
<td>1,500</td>
<td></td>
</tr>
<tr>
<td>100 Final Survey</td>
<td>3,125</td>
<td></td>
</tr>
<tr>
<td>16 Land</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Works:–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 Clearing</td>
<td>1,875</td>
<td></td>
</tr>
<tr>
<td>1,100 Earth work</td>
<td>34,375</td>
<td></td>
</tr>
<tr>
<td>398 Bridges and culverts</td>
<td>12,437</td>
<td></td>
</tr>
<tr>
<td>274 Three viaducts</td>
<td>8,562</td>
<td></td>
</tr>
<tr>
<td>1,379 Permanent way and ballast</td>
<td>43,092</td>
<td></td>
</tr>
<tr>
<td>284 Stations and terminal buildings</td>
<td>8,875</td>
<td></td>
</tr>
<tr>
<td>50 Electric telegraph</td>
<td>1,563</td>
<td></td>
</tr>
<tr>
<td>672 Administration and Engineering</td>
<td>21,000</td>
<td></td>
</tr>
<tr>
<td>96 Plant</td>
<td>3,000</td>
<td></td>
</tr>
<tr>
<td>4,429 Rolling Stock:–</td>
<td>138,404</td>
<td></td>
</tr>
<tr>
<td>Additional for two trains per day in the extension to Pehwhahun.</td>
<td>9,505</td>
<td></td>
</tr>
<tr>
<td>4,733</td>
<td>147,909</td>
<td></td>
</tr>
</tbody>
</table>

* This item is not included in the estimate of work to be done because it has been already expended.
Details of Estimate.

Reconnaissance Survey.
This is the approximate cost of the portion of Mr. Gaffney’s Survey in 1899 which included the line from Rotofunk to Pehwahun.

Final Survey and Clearing.
This estimate is framed from the experience gained during the last three years, modified by the density of the bush between Rotofunk and Pehwahun.

The Earthwork.
has been estimated in detail as far as the information afforded by the preliminary survey would suffice, and is equal to 14,700 cubic yards per mile.

Bridges, Culverts, and Viaducts.
The cost of transporting the materials for the construction of these viaducts over the 56 miles of line, from Freetown to Rotofunk, has been taken into account in the estimate for these works.

Permanent Way and Ballast.
This very heavy item has been estimated by taking into account the very considerable rise in the prices of railway materials during the last twelve months, rails being £7 per ton f.o.b. The amount is also intended to include the cost of transport over the line to Rotofunk, as well as over part of the section under construction.

Administration and Engineering.
This item, which is considerable, is based upon the present expenditure upon the Sierra Leone Railway, on the assumption that the section from Rotofunk to Pehwahun, with its viaducts, would occupy a period of two years in construction.

Rolling Stock.
A small quantity of additional rolling stock has been estimated for working the additional length of line.

N.B. – The above estimate of the cost of the railway from Rotofunk to Pehwahun (31 1/4 miles) has been prepared because Mr. Gaffney’s reconnais-
sance survey located the line over that length, and to afford a mileage rate for the construction of a railway upon the Sierra Leone standard in country such as that found between Rotofunk and Bo. By this means the total cost of any portion, or the whole, can be calculated.

16. We have considered, as an alternative to a railway constructed upon the Sierra Leone standard, the cost of a light line somewhat similar to that which would be laid in this country by a contractor over the surface of the ground and commonly known as an ‘overland route.’ This light line would, however, be superior to a contractor’s line, as we have estimated for steel rails and sleepers identical in all respects with those of the standard line. Moreover, the light line would require surveying and clearing the same as the standard line, but it is considered that a substantial saving would be effected in earthworks, buildings, and administration by pushing forward the permanent way. Our estimate for the light line, made from such information as is afforded by Mr. Gaffney’s flying survey, amounts to £3,043 per mile exclusive of rolling stock, and £3,214 per mile inclusive of rolling stock, making a total of £161,500 for the 50 1/4 miles from Rotofunk to Mano and £258,700 for the 80 1/2 miles from Rotofunk to Bo. /

**SIERRA LEONE (KWALU) SURVEY, 1899.**

**APPROXIMATE ESTIMATE FOR LIGHT RAILWAY (2 ft. 6 in. Gauge).**

**ROTOFUNK TO BO.**

*Length 80 1/2 miles.*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Preliminary Expenses:</strong></td>
<td><strong>£</strong></td>
</tr>
<tr>
<td></td>
<td>*5 1/2 Flying Survey in 1899</td>
<td>450</td>
</tr>
<tr>
<td></td>
<td>100 Final Survey</td>
<td>– 8,050</td>
</tr>
<tr>
<td></td>
<td>6 Land</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td><strong>Works:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 Clearing</td>
<td>3,220</td>
</tr>
<tr>
<td></td>
<td>532 Earthworks</td>
<td>42,826</td>
</tr>
<tr>
<td></td>
<td>355 Bridges and Culverts</td>
<td>28,577</td>
</tr>
<tr>
<td></td>
<td>1,399 Permanent Way and Ballast</td>
<td>112,619</td>
</tr>
<tr>
<td></td>
<td>150 Stations and Buildings</td>
<td>12,075</td>
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<td></td>
<td>50 Telegraph</td>
<td>4,025</td>
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<tr>
<td></td>
<td><strong>Administration and Engineering</strong></td>
<td>30,000</td>
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<tr>
<td></td>
<td>37 Plant</td>
<td>3,000</td>
</tr>
<tr>
<td></td>
<td>3,043</td>
<td>244,892</td>
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<tr>
<td></td>
<td>171 Rolling Stock (additional)</td>
<td>13,770</td>
</tr>
<tr>
<td></td>
<td>3,214</td>
<td>258,662</td>
</tr>
</tbody>
</table>

* This item is not included in the estimate of work to be done because it has been already expended.
Estimate for Light Railway:— Details.

Survey.

The flying survey by Mr. Gaffney in 1899 is estimated to have cost £450.

The final survey for the light line must be estimated to cost the same as the survey for a more permanent railway, for the best route for a light surface line will require to be as carefully picked out in the dense bush as a heavier line. Moreover, this survey, when made, will probably give the route for the heavier line when desired, excepting at a few difficult points where it may be advisable to construct at first an inexpensive line by making a detour from the best route for a more permanent railway. Such a survey, from past experience, may be estimated to cost £100 per mile.

Land.

All land beyond Pehwahun, being in such a remote part of the country, varying from 86 to 136 miles from Freetown, may be assumed to be freely given to the railway, the benefit to the native chiefs or other landowners by the construction of the line being more than ample compensation for a few acres of ground. £500 is allowed for land as far as Pehwahun. /

Clearing.

The width of clearing for a light line must be the same as for the heavier one. The width of 66 feet allowed on the Freetown-Songo Town section is by no means too much, as the neighbouring bush rapidly encroaches upon the open space.

According to the description given by the surveyors, £40 per mile will suffice for clearing and for the necessary grubbing up of stumps, as the country beyond Pehwahun is more open than that nearer Freetown.

Earthwork.

With no data but that supplied by a flying survey it is impossible to estimate with accuracy the quantity of earthwork required. From the description of the country it seems as if a surface line will be possible for most of the distance, and it is therefore safe to assume that the earthworks required will not exceed the equivalent of a 2 foot 6 inch bank throughout, or 7,100 cubic yards per mile.
Bridges and Culverts.

Under this head no less than 41 swamps or swampy rivers have to be dealt with. After carefully considering the matter, Mr. Gaffney stated that most of these swamps may either be avoided altogether or drained into streams inexpensively by the digging of the side ditches of the railway.

All bridges and culverts for this light railway will be of a temporary nature, probably of timber, of which there is a plentiful supply throughout. It is anticipated that detours from the most direct route will have to be made in the case of the crossings of the larger streams.

Permanent Way and Ballast.

This has been estimated for as similar in all respects to the permanent way already laid to Songo Town. It would be unwise to make the rails lighter, and if the sleepers are of steel, the railway will be in all respects equal to the line now open to Songo Town where it traverses easy country. The estimate for this heavy item is based on the present abnormally high prices, taking rails at £7 per ton f.o.b.

Stations and Buildings.

The station buildings will be of a less permanent character than constructed on the line already made. Probably buildings with a good timber framing, covered with corrugated iron sheeting will be found sufficient, such as are now being used on the Rotofunk extension. The cost of these can hardly be reduced as they will be required for the use of the Staff.

17. The comparative costs of the standard and light lines to Mano and Bo are shown in the following table:–

<table>
<thead>
<tr>
<th></th>
<th>Rotofunk to Mano</th>
<th>Rotofunk to Bo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sierra Leone Standard Line</td>
<td>£237,833</td>
<td>£381,006</td>
</tr>
<tr>
<td>Light Line</td>
<td>£161,500</td>
<td>£258,700</td>
</tr>
<tr>
<td>Saving</td>
<td>£76,333</td>
<td>£122,306</td>
</tr>
</tbody>
</table>

N.B. – Before the works of the light line can be regarded as permanent, it is possible that the bridges will have to be renewed at a cost of about £400 per mile, thus reducing the saving to £56,233, and to £90,106 for the Mano and Bo lines respectively.

18. The expediency of such a light line depends upon local circumstances, and is now under the consideration of the Chief Resident Engineer, who has been instructed by / His Excellency the Governor to examine the country with this view. Its object would be to facilitate the construction of the heavier works, and especially to arrive at a productive point by hurrying the development of the
district. This can only be accomplished by pushing forward the permanent way over temporary bridges, and in a temporary manner, with a view to carrying traffic in construction trains before completing the permanent works.

19. Subject to the question of expediency now under consideration, we are of opinion that the time has arrived for carrying out such a light railway. It is in accordance with the views of Sir Frederic Cardew, as expressed from time to time and more particularly set forth in the following abstracts from his able ‘Observations on the Report of the Royal Commissioner on the Insurrection in the Sierra Leone Protectorate, 1898 (“Hut Tax Revolt”):’–

‘So long as trade is hampered by the present expensive system of transport, I mean the carriage on men’s heads of all kinds of merchandise and produce, and by the extreme difficulty experienced by travellers and traders in getting carriers at almost any price, no great increase in trade or revenue can be looked for in a colony like Sierra Leone with its very limited hinterland. Light railways appear to me the best practical solution of this most important question of inland transport. The difficulties attending the use of oxen or mules for draught purposes seem insuperable.’

‘But given that such animals could live and work, they cannot pull vehicles over soft roads through mud and dirt and swamps, and across streams and rivers, so metalled roads would have to be constructed on scientific principles, gradients eased, causeways constructed over swamps and morasses, culverts erected, streams bridged, and ferries established across the large rivers. The construction and keeping open such roads would entail, as regards first cost and maintenance, an expenditure perhaps little short of the construction and maintenance of light railways.’

Moreover, it is in accordance with the view expressed in Mr. Shelford’s Report of August 1894, page 2, 3rd paragraph, which was to the effect ‘that the country may not be able to support the cost of the standard railway, and that it may consequently be desirable to adopt a special construction of lighter type, which, though not equal to the standard, will still be a great advance in a country destitute of beasts of burden, and depending entirely upon human labour for transport wherever water-carriage is not available.’ Again on page 4 of the same report (paragraph 7) the maximum gradient proposed for the light line then under discussion was 1 in 30, and it was suggested that ‘the undulations of the country lend themselves to the convenient working of such gradients with ordinary engines, and to the eventual improvement of the gradients by lowering their summits when the increase of the traffic demands it and justifies the expense.’ We think it right, however, to say that we do not recommend the adoption of a steep gradient in great lengths, except under exceptional circumstances, such as we gather from the surveyors’ information are not likely to arise in this case, and our experience in Sierra Leone leads us to prefer a maximum of 1 in 35. As
bearing upon the development of the country which we desire to expedite, we
would also call attention to page 8 of the same report (3rd paragraph), wherein
it is shewn how ‘carriers, where now employed in transport, will be unable to
continue this occupation, and will be set free (by the construction of a railway)
to bring the same produce to the railway close at hand, and to go farther afield
into the palm belt to fetch it,’ and we may add that it is reported from Sierra
Leone that the effect of the railway is to carry the merchants and traders into
the districts which are further afield, thus leading to an increase of business in
imports and exports.

Traffic Prospects.

20. The traffic prospects of the extension of the railway beyond Rotofunk have
been the subject of much anxious consideration on our part. At the time that Mr.
Gaffney carried out his survey the country was suffering acutely from the shock
of the recent disturbances, and in fact the punitive expedition had not yet left it.
The time was, therefore, most unfavourable for making any estimates of traffic.
Mr. Gaffney nevertheless endeavoured to get at the possible results obtainable
from a railway under the conditions prevalent in West Africa, including domes-
tic slavery, which under another name appears to exist to a large extent in the
interior of the country, where many of the people are at the disposal of their
chiefs, and are available for carrying produce out and imports inward at a cost lit-
tle above their daily subsistence. Mr. Gaffney appeared to think that the railway
could compete with this labour, even under such conditions, inasmuch as the
natives would prefer to stop at home and to carry the goods to the railway, and
that, in any event, slavery would be of short duration, as the idea of freedom and
liberty was rapidly growing amongst them and would continue to do so. He fur-
ther expressed the opinion, which he had derived from the natives themselves,
that the quantity of produce to be sent to market from the interior depended
only upon the number of people available for carrying it out, and which would
be largely increased by the making of the railway.

Population.

21. Mr. Gaffney appears to have been greatly impressed with the evidence of
population in that part of the Protectorate which would be traversed, and from
the figures which he has given of the villages actually passed through, it would
seem that the number of people between Mano and Bo is 406 per mile run, and
that the average for the whole length from Rotofunk to Bo is 232 per mile run.
Comparing this with the population met with on the line from Songo Town to
Bumban, as given in Mr. Shelford’s Report of 1895, the average was 214 per mile
run, but the extremes were greater, the minimum being 112 and the maximum 568 per mile run.

Mr. Gaffney forms the opinion from his observations and calculations, supported by his experience of similar districts in Sumatra, and in two counties of Ireland, that the average population of the country may be taken at not less than 100 per square mile.

22. The Governor, Sir F. Cardew, who has seen personally more of the district, and particularly of this route, than anyone else who has had to consider the subject, does not put the number so high, but he is also of opinion that the population is abundant, and, as evidence, he quotes an estimate of the number of huts in the Protectorate in which they were returned at 80,000, and 35,000 were actually counted in the southern district, through which the line passes. This number of huts would represent at least 300,000 people, of which it may be considered that 250,000 would fall [...] within the influence of the extension.

From these statistics and the mileage population recorded along the surveyed routes, it seems reasonable to assume that the district served by the railway is inhabited by 250,000 persons or say 50 per square mile of area served by the railway.

Existing Trade.

23. We have obtained from the Colonial Government the statistics for recent years of the imports and exports of the Colony, and of each of the ports on the coast south of Freetown, copies of which last are appended (Appendix B). They shew some remarkable results.

24. In the first place, the financial position of the Colony of Sierra Leone in relation to the other West African Colonies – Gold Coast and Lagos – may be noted.

Their respective Revenues in 1897 and 1898 were:–

<table>
<thead>
<tr>
<th></th>
<th>1897</th>
<th>1898</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold Coast</td>
<td>233,179</td>
<td>258,822</td>
</tr>
<tr>
<td>Lagos</td>
<td>177,420</td>
<td>Not ascertained.</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>106,009</td>
<td>117,681</td>
</tr>
</tbody>
</table>

shewing an increase of 11 per cent. for the Gold Coast and the same amount for Sierra Leone, which is satisfactory, the more so because in the latter case the revenue is the highest ever received. /

Again, the value of the Imports in the years 1896, 1897, and 1898, which may, however, have been in some cases affected by exceptional causes, was:–
in which the excessive return for Sierra Leone in 1898 was probably due to the military operations.

The value of the *Exports* in the same years was:–

<table>
<thead>
<tr>
<th></th>
<th>1896</th>
<th>1897</th>
<th>1898</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold Coast</td>
<td>£778,001</td>
<td>£784,188</td>
<td>£960,336</td>
</tr>
<tr>
<td>Lagos</td>
<td>£901,474</td>
<td>£770,510</td>
<td>£908,351</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>£494,688</td>
<td>£457,389</td>
<td>£606,348</td>
</tr>
</tbody>
</table>

As the last two years at Sierra Leone were crippled by the ‘native revolt’ too much importance should not be attached to them.

The general conclusion to be derived from these figures is that the total trade of Sierra Leone is in value about one-half of that either at Lagos or the Gold Coast.

25. Secondly, it will be useful to note the relative proportions of the staple articles of export, from the same ports, such as palm oil, palm kernels, and rubber. For example, in 1897 there was exported:–

Palm oil from –

<table>
<thead>
<tr>
<th></th>
<th>Gallons.</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold Coast</td>
<td>2,021,716</td>
<td>Lagos</td>
<td>1,858,968</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>181,647.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

or less than one-tenth of the oil from the other two. But taking palm kernels for the same year we find:–

<table>
<thead>
<tr>
<th></th>
<th>Tons.</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold Coast</td>
<td>10,836</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lagos</td>
<td>not ascertained.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>17,671,</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

or about 70 per cent. more than the product of the larger colony. / Again, in 1897 rubber was exported from –

<table>
<thead>
<tr>
<th></th>
<th>Lbs.</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold Coast</td>
<td>4,957,016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lagos</td>
<td>4,458,327</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>1,305,696,</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

or about one-third the product of each of the larger colonies.
The conclusion appears to be justified that the exports of Sierra Leone are remarkably deficient in palm oil as compared with the other colonies, whilst in palm kernels they are excessive, and in rubber nearly normal, i. e., one-third as against one-half which would be the due proportion.

26. Thirdly, the figures obtained from the Colonial Government since the survey was made indicate the volume of trade at each of the ports south of Freetown and to seaward of the railway; thus in 1897 the total quantity of palm oil exported from Sierra Leone was 181,647 gallons, of which –

<table>
<thead>
<tr>
<th>Gallons.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherbro’ contributed</td>
<td>142,964</td>
</tr>
<tr>
<td>Sulima</td>
<td>8,805</td>
</tr>
<tr>
<td>*Mano Salija</td>
<td>13,645</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>165,414</td>
</tr>
</tbody>
</table>

**Weight.**

<table>
<thead>
<tr>
<th>Tons.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Freetown, balance</td>
<td>16,233 = 690 tons.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>181,647 = 770 tons.</td>
</tr>
</tbody>
</table>

showing that 90 per cent. comes from the southern ports.

In the same year, 1897, the total weight of palm kernels was 17,671 tons, of which –

<table>
<thead>
<tr>
<th>Tons.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherbro’ sent</td>
<td>9,982</td>
</tr>
<tr>
<td>Sulima</td>
<td>477</td>
</tr>
<tr>
<td>*Mano Salija sent</td>
<td>1,214</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11,673 tons.</td>
</tr>
</tbody>
</table>

of which about 60 per cent. was from the southern ports.

Again, in the same year, 1897, the total weight of rubber exported was 11,658 cwt., of which –

<table>
<thead>
<tr>
<th>Cwt.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherbro’ sent</td>
<td>4 ¼</td>
</tr>
<tr>
<td>Sulima</td>
<td>1 ¼</td>
</tr>
<tr>
<td>*Mano Salija sent</td>
<td>64 1/2 Cwt.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>70</td>
</tr>
</tbody>
</table>

**Total** 11,588 = 579 tons.

shewing that practically the whole goes from Freetown.

* This is far distant from ‘Mano’ on the railway. /
27. For the same year, 1897, the aggregate tonnage of African produce exported from Freetown was given by the Collector of Customs as 11,381 tons, including, as above –

<table>
<thead>
<tr>
<th></th>
<th>Tons.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palm oil</td>
<td>690</td>
</tr>
<tr>
<td>Palm kernels</td>
<td>5,998</td>
</tr>
<tr>
<td>Rubber</td>
<td>579</td>
</tr>
<tr>
<td>Total</td>
<td>7,267</td>
</tr>
</tbody>
</table>

equal to about two-thirds of the whole, and leaving one-third to be made up of various products.

28. The inferences which may be drawn from these figures appear to be:–

(1.) Freetown is not yet a shipping port for palm oil, the nearest palm forest being at Rotofunk (55 miles).

(2.) The greatest weight of palm produce exported is in kernels, of which the larger part (60 per cent.) comes from Sherbro’ and other southern ports, Freetown exporting about 40 per cent. only.

(3.) Palm oil does not form a large trade, probably because of the difficulty of transport; palm kernels are worth less, weight for weight, but are perhaps more easily carried through bush and swamp.

(4.) Freetown almost monopolizes rubber because it is valuable as compared with its weight, and will bear the cost of transport by native carriers.

(5.) The extension of the railway should revolutionize Nos. 1, 2, and 3, while No. 4 should further improve greatly.

*Proposed Extension by Sections.*

29. The first section of the extended line from Songo Town to Rotofunk being well in hand, it is time to determine the objective points of the proposed extension. Of these three have been suggested – Moyamba, Mano, and Bo. Moyamba (22 miles), being the new headquarters of the district, and the centre also of the gum copal cultivation of industry, has been considered, but in the absence of palms and rubber a line built to Moyamba cannot be regarded as likely to be a very productive length. Mano (50 1/4 miles) is the nearest centre upon which traffic of all kinds may be expected to converge, and where the area influenced by the railway free from competition becomes more important. It is, however, at Bo (80 1/2 miles) where the full benefit of the line will be felt, and where the area which the railway will materially affect reaches large dimensions. The map (not included) shows three coloured areas, each of which has its apex at Songo Town. The first is based upon Rotofunk as a centre, and is the smallest because it is circumscribed by competing navigations and roads; but this section, like the main line to Freetown, does not depend upon the area from which traffic may be
produced so much as on the quality of the traffic, which here is enhanced by a valuable palm forest, reported to cover only a few square miles. The next section has Mano for its centre, and a traffic area of 2,215 square miles, in the southern part of which it may be expected that competition with the navigations will be felt for certain classes of goods. The third section, with Bo as its centre, opens up an extensive traffic area of 5,276 square miles, which will be affected doubtless on its southern side by water competition, but on the whole rich in natural products, and inhabited near its centre, according to Mr. Gaffney, by a better-class and an industrious people.

30. These traffic areas go far to justify the opinion of Sir Frederick Cardew already referred to, but before such a conclusion can be accepted it will be necessary to examine the effect of other factors, such as the capital to be expended upon construction, the annual charges for interest and sinking fund, the cost of working, and the rates obtainable from passengers and freight. The following table is intended to give this information for each section of the extension in a convenient form, and on the assumption (1st) that the works will be carried out on the Sierra Leone Government railway standard; and (2nd) that an alternative and cheaper line will be adopted to expedite the opening up of the country and to save capital expenditure in the first instance.

31. It will be observed that the ninth column shows the amount in £ per square mile (of the traffic areas) which must be contributed in order that all charges, including interest and sinking fund, may be met, and that this figure is lowest (£11) in the case of the greater extension to Bo and by the adoption of the lighter line.

This amount may be made up in passengers and goods thus:

<table>
<thead>
<tr>
<th></th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passengers, 50 per square mile, 1 journey per annum at 1s. for average price of a ticket</td>
<td>2</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Goods.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 tons – Exports hauled 125 miles at 4d. per ton per mile</td>
<td>4</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Imports in smaller quantities at higher rates</td>
<td>4</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

32. The traffic area is 5,276 square miles, and if the whole produce carried by the railway were palm oil, the annual tonnage of exports would be 5,276 square miles x 2 tons = 10,552 tons, in addition to the 11,381 tons of produce shipped at Freetown in 1897, which would still be a reasonable quantity for Freetown to ship, and which could be drawn by the train mileage provided in the estimate.

33. Applying the figures in the table to the Mano traffic area we have to account for £21 per annum per square mile.
### SIERRA LEONE (KWALU) SURVEY.

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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Freetown to Roto-funk.</td>
<td>55 ¾</td>
<td>Sierra Leone Standard now constructing.</td>
<td>290,000</td>
<td>14,500</td>
<td>12,500</td>
<td>27,000</td>
<td>507</td>
<td>53</td>
<td>50</td>
<td>2,100</td>
<td>25 5 0</td>
<td>25 5 0</td>
<td>47</td>
</tr>
<tr>
<td>Freetown to Mano</td>
<td>105 ½</td>
<td>Sierra Leone Standard at £4,733 per mile.</td>
<td>527,833</td>
<td>26,392</td>
<td>24,049</td>
<td>50,441</td>
<td>2,215</td>
<td>23</td>
<td>50</td>
<td>2,100</td>
<td>10 5 0</td>
<td>10 5 0</td>
<td>388</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard Line to Roto-funk, then Light line at £3,214 per mile.</td>
<td>451,500</td>
<td>22,575</td>
<td>24,049</td>
<td>46,624</td>
<td>2,215</td>
<td>21</td>
<td>50</td>
<td>2,100</td>
<td>9 5 0</td>
<td>9 5 0</td>
<td>388</td>
</tr>
<tr>
<td>Freetown to Bo.</td>
<td>135 3/4</td>
<td>Sierra Leone Standard at £4,733 per mile.</td>
<td>671,006</td>
<td>33,550</td>
<td>29,126</td>
<td>62,676</td>
<td>5,276</td>
<td>12</td>
<td>2,100</td>
<td>4 1 5 0</td>
<td>4 1 5 0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Communications in Africa, 1880–1939: Volume 2

Standard Line to Ross-funk, then Light Line at £3.214 per mile.

<table>
<thead>
<tr>
<th></th>
<th>548,700</th>
<th>27,435</th>
<th>29,126</th>
<th>56,561</th>
<th>5,276</th>
<th>11</th>
<th>50</th>
<th>2 10 0</th>
<th>4 5 0</th>
<th>4 5 0</th>
<th>125</th>
</tr>
</thead>
</table>

This district being so far up country people may be assumed to travel 12 miles at 1d., or at a total fare of 1s.

Freetown to two-thirds distance along the section of extended line referred to.

Note. – 2 tons of palm oil produced per annum per square mile (= per 50 people) is very small. One man can produce about 400 lbs. of palm oil and kernels in one week, or 2 tons in 11 weeks.
Allowing one man out of five people the above is about 1/50 of what might be done by the population, thus proving that the labour will be sufficient.

\[
\begin{array}{ccc}
\text{Passengers as before} & 2 & 10 \ 0 \\
\end{array}
\]

\[
\begin{array}{ccc}
\text{Goods.} & \\
6 \ 1/4 \ Tons. – Exports hauled 88 miles at 4d. per ton per mile & 9 \ 5 \ 0 \\
Imports in smaller quantities at higher rates & 9 \ 5 \ 0 \\
£21 \ 0 \ 0 \\
\end{array}
\]

from which it appears that the weight of the exports from the smaller Mano area, will have to be more than three times greater per square mile than that from the larger area – Bo, which may involve a greater development of the country before it is accomplished.

\section*{Working Expenses.}

34. Working expenses are difficult to estimate. We have calculated the amounts shewn in the table at the mileage rates estimated by Mr. Hill for the Freetown and Rotofunk line revised to date, and have assumed that the same figures will apply also to the working of the light line.

35. In conclusion, the above investigation of the conditions applying to the proposed extension confirms the opinion of Sir Frederick Cardew when he said that 'the further the line goes the better it will pay.'

There remains only the local question of the expediency or otherwise of pushing the work forward as a cheaper line than the standard hitherto constructed, the advantages of which (if its expediency is confirmed) are:

\[
\begin{array}{ccc}
\text{Mano Section} & \text{Bo Section} \\
£76,333 & £122,306 \\
\text{Or allowing for the reconstruction of bridges} & £56,233 & £90,106 \\
\end{array}
\]

(2.) A reduction in the value of gross receipts required, and therefore in the time necessary for developing the country.

36. The moral effect of more rapid construction will be advantageous to the Colony, and any economy of capital expenditure which can be obtained from the construction of a cheaper line of railway will form a
reserve available for the widening of the Wharf at Freetown, a matter which is not considered in this Report, and for which the information is not yet forthcoming, but is nevertheless absolutely necessary for the conduct of the traffic expected at the port.

37. It is, in our opinion, necessary for the development of the Colony that the line should be constructed to Bo if possible, and in no case to a less distance than Mano, but in such sections as may be convenient; and as the staff arrangements are now being made for the ensuring dry season, we shall be glad to be favoured with your early instructions.

We have, &c.,

SHELFORD AND SON. /
APPENDIX A.

SIERRA LEONE (KWALU) SURVEY, 1899.

Report of Mr. F.S.B. GAFFNEY, Assoc. M. Inst., C.E.

To Messrs. SHELFORD & SON,

35a, Great George street,
Westminster.

Sirs.

In accordance with your instructions, I left Liverpool upon January 7th for Sierra Leone accompanied by Mr. Mercer as Medical Officer to the expedition, while my colleague, Mr. Summerscale, not being able to accompany as, left by the following mail, January 14th. We arrived at Freetown on Sunday the 22nd.

On January 25th I started alone for the interior, leaving the doctor behind for urgent duty in connection with the railway construction party, caused by the illness of one of the railway medical officers.

I travelled by rail as far as Songo Town, where I expected to find 50 carriers provided by the Resident Engineer, but those who had been provided had deserted and I was supplied with 50 labourers from the railway. All preparations being made, I started at 7 a.m. on January 26th and proceeded towards Roafunk.

The first right was spent at Bandasuma with a survey party who were locating the extension of the railway from Songo Town to Rotofunk.

Preliminary Examination.

The next day I passed through Rotofunk, at which place my survey was to begin, and reached Mongire, six miles on the road towards Kwain. Here most of my carriers ran away, and I was obliged to remain for a whole day.

I then started with 10 carriers and reached Moyamba, 21 miles from Rotofunk, and spent the night there. The following morning, the 30th, I went into Kwalu, 31 miles altogether Rotofunk, I had hoped to see the District Commissioner, but he was unfortunately away. The officer acting for him informed me that Kwalu would soon cease to be the headquarters of the district, and he believed that Moyamba had been selected for the new site, and it was probable
that the villagers would follow soon after the officials. I communicated this fact to you, with the result that I received orders to alter my original instructions, which will be described later in my report. I returned that afternoon to Moyamba, and on the next day to Rotofunk, which I reached at 4 p.m. and where I met my colleague, Mr. Summerscale, who had arrived in Freetown on the 28th.

**Reconnaissance Survey.**

I resolved to camp at Rotofunk for some time, so we fixed our camp and began our survey the next day, the 1st February. We remained in Rotofunk till the 11th February, on which date we changed camp to Mongire. We worked from that place until March 2nd when we removed our camp to Makora, 7 miles further on, and on the 18th we removed to Moyamba, 21 miles from Rotofunk.

**Flying Survey.**

On the 31st we left most of our heavy equipment here and started on the ‘Flying Survey’ to Tikonko via Mano, having now completed the reconnaissance survey as far as Moyamba. On the 15th April we returned via Kwain to Moyamba, having completed 120 miles of Flying Survey.

**Reconnaissance.**

We then continued to carry on the reconnaissance on the direct road to Mano on Monday, 17th April, and completed it as far as Pehwahun, 31 miles, on the 29th April. On May 2nd we started for home and reached Songo Town on Thursday, 4th May, and handed in our instruments and equipment to the railway extension stores. 

  The next day we went by train to Freetown, the whole line having been opened on May 1st by His Excellency the acting Governor.

  On Wednesday, the 10th, we sailed for home on board the S.S. ‘Jebba’ and reached Liverpool on May 23rd. [...]

**THE RECONNAISSANCE SURVEY.**

**Description of the Country from Rotofunk to Moyamba.**

*Rotofunk* is a very suitable site for a prosperous town. It is prettily situated on the banks of the Lower Bumpe River, and bears many traces of recent cultivation of a kind superior to that of the neighbouring country.
This was the headquarters of the American mission where they did good work for over a quarter of a century in educating and civilizing the natives, but in May 1898 they were suddenly attacked by the hostile tribes, who came from the interior during the ‘Hut Tax Revolt,’ and four ladies and the Superintendent were brutally massacred, all their property looted, and their houses and schools burned to the ground. Most of the rising little town was at the same time burned, and those inhabitants who did not escape were for the most part killed.

The town has now begun to revive, and the natives, who during the scare hid in temporary huts in the thick bush, are gradually returning and rebuilding their houses. The rained foundations indicate what an extensive village Rotofunk once was, and it is reported that it contained about 1,200 inhabitants. There is every reason to hope that in the near future it will resume its former dimensions.

From here proceeding towards Kwalu on the ‘High road,’ as it is called, one passes over the Bumpe by a native-made bridge composed of large mahogany baulks (moored by tough stems of creepers) and arrives at the village of Geremah within half a mile. Up to this point the country is quite open, and, though there are no spaces now actually under cultivation, one can easily perceive that there was much of it a short time ago growing rice and piassava.

After this the road enters dense forest and continues for about 6 miles with the exception of a few valleys, where one is able to see a little of the surrounding country. The timber is composed mostly of cotton and gum trees.

This forest so near the road is misleading as to the general characteristics of the country. In some places, where long cuttings had to be made for the purpose of fixing a trace for the line, it was discovered that the larger bush was merely left as a screen to conceal the cultivation, and open cultivated ground lay beyond. This arose from the frequent raids that were formerly made by the more warlike races of the interior, who repeatedly swooped down during the harvest and carried away all the produce they could find. The effect is that even now when the villagers of the country east of the Yambutu wish to plant their rice and piassava they invariably do so in as remote a spot as possible. This condition of things applies to the whole of the track surveyed to Moyamba, and were one to traverse the country without exploring or enquiry, the impression left would be that it was quite desolate and devoid of cultivation.

Mongire. – The next village, Mongire, is six miles from Botofunk, and formerly consisted of about 80 native houses. It is situated on the top of a high apex between two streams which here meet.

During the war the inhabitants of Mongire took part with the hostile natives, so that when our forces arrived they burned every house in the village. The natives are now returning, and when last I passed through, fully half of the former town was rebuilt. When encamped here I had an opportunity of explor-
ing the neighbourhood, and was much surprised to find in nearly every direction where I penetrated the bush the traces of a large population.

Numerous groups of small huts are to be found in small villages or ‘fakus,’ and according to the system described above, their extensive cultivation is carried on far away from the main thoroughfare.

As far as Mongire the rough formation of the country is fairly uniform, consisting of steep hills composed of laterite gravel, rising abruptly from swampy valleys or marshes, which in the wet season are covered with water.

There are three such marshes up to this point, but the widest, at 5 1/2 miles, only measures some 100 yards across.

Taking these valleys as a base the rise to this point is only 50 feet in 5 1/2 miles.

Boia. – At 7 3/4 miles is the next village, and is situated on a spot almost exactly similar to Mongire, that is upon an apex of an acute triangle of high ground projecting into a swamp. Here the natives had been in sympathy with the hostile forces, with the ultimate result that their village was utterly destroyed. They have now begun to rebuild, and though little has been yet done, no doubt in time the whole place will be restored.

At 9 3/4 miles a steep valley is encountered, and the road descends abruptly some 60 feet into a marsh and stream, after which it rises equally abruptly to the village of Tungie, which from Mongire to this place passes through thick bush, and though it could hardly be recent history is similar to the others, and the inhabitants are only now beginning to rebuild their houses there.

The road from Mongire to this place passes through thick bush, and though it could hardly be described as forest, the trees run to about 30 feet high. By this village, like the others, flows a river on each side, and they meet at some distance on the south side, that on the east is of considerable size and subject to floods, as evinced by the native bridge some seven feet higher than the existing summer flow. After crossing the east river, one ascends another hill of laterite, and at 10 1/2 miles another river is met with which was found to join the last two mentioned.

A narrow marsh occurs at 11 1/2 miles, which was found not to extend far on the south side, so the railway can be carried round it without coming down to its level.

Makora is a village at 12 3/4 miles, built on a site the physical features of which are remarkably similar to the others. The natives of this village acted differently to those of the former villages during the war, at the outbreak of which they built a strong double barricade round their town, and stoutly resisted the attacks of the unfriendly tribes. The result is that they now possess a compact little village of some seventy houses closely built together, and with a population
of four or five hundred natives living in comfort. On account of the precautions of the natives in hiding their harvest, there is no sign of any cultivation, though that it exists and in a large quantity I learned on enquiry.

The road now rises and keeps fairly level up to 14 3/4 miles. The soil is like most of the rest, composed largely of red clay mixed with boulders and laterite gravel, and as far as one can see the country is all covered with thick bush from 15 to 30 feet high.

The next swamp is at the edge of the village of Yoyema where the road drops 50 feet, and a swamp of 4 chains and a small stream have to be crossed.

Yoyema is 15 miles from Rotofunk, and like Makora, it held out against the unfriendlies with strong barricades, and now contains about 65 houses and about 450 inhabitants. Unlike the other places the road continues from this village at the same level. The country is more open for two miles and a deep valley runs parallel on the north about a quarter of mile distant, at the edge of which a level for the railway was found.

At 15 3/4 miles the road suddenly drops into a swamp about 3 chains wide, and at a few hundred yards further another swamp 4 chains wide has to be crossed, but both swamps meet further down where the railway will cross and only one bridge will be required. The soil here for a few miles contains less laterite, but at 17 miles it gradually changes and many boulders of laterite shew on the surface, and from 17 1/2 to 19 miles it appears to be practically a solid rock, though the forest on either side indicates that there must be plenty of soil in the interstices. From 17 1/2 miles the country rises, but the deep valley on the north continues parallel to the road. Here an unusual feature is observed, the road suddenly emerges from the thick bush and an open undulating plain about half a mile long and from 500 to 800 feet wide is passed. It is called the ‘grass field’ by the natives, and in the rainy season a coarse grass grows upon it about 3 feet high, though in the midst of the dry season it appears to be laterite rock with gravel strewn upon it.

At 18 1/4 miles the highest point in the survey is reached, viz., 377 feet above mean sea level, but the ground drops abruptly towards the valley, which here approaches nearer to the road, so that a level for the railway is easily found.

Moyamba – The road passes through high forest till 20 miles is reached, and here one enters the large clearing made by Government for the new Administrative headquarters. It is a fairly level space nearly half a mile long and 1/4 mile wide, and is fully 70 feet higher than the river Yambutu. A deep gully surrounds this plain, running along the south and sweeping in a curve to the north, where it joins the big river Yambutu which flows to the south.

In the triangle thus formed by the gully meeting the river is the thriving village of Moyamba, containing about 700 inhabitants. It was one of our friendly towns in the war, but got burned and sacked by the hostile natives. With great
promptitude it was rebuilt, and is now as prosperous as ever. On the east side of this town a very fine river – the Yambutu – flows to the south, it is 120 feet wide and deep enough for the main traffic to be carried by a canoe ferry. Higher up stream, on the north of Moyamba, a natural ford exists in the dry season, where a road to Ronietta crosses the river and the width is less, and here it is proposed to erect a bridge for the railway.

Near this point Madame Roko – the Queen of the Ronietta district – has begun to establish her headquarters, and for this purpose made a large clearing, and intends to move her whole village from Kwain.

Moyamba is in the centre of a very fine country, and a wide view of the densely covered mountains on all sides may be obtained. In the town a good deal of European produce is disposed of by native traders. Some of the shops contain English clothes, stationery, ornamental belts, men’s hats, pipes, cheap musical instruments, &c. This is 75 miles from Freetown, and all these commodities would have to be carried on the heads of natives, and hence it is that it is only since the railway was opened to Waterloo that these European articles appeared in the distant villages. / The following is a list of the villages from Rotofunk to Moyamba, with their approximate populations and their distances by the proposed railway from Rotofunk:–

<table>
<thead>
<tr>
<th>Village</th>
<th>Distance by Railway from Rotofunk</th>
<th>Populaties Before the War.</th>
<th>Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotofunk</td>
<td>0 0</td>
<td>1,200</td>
<td>–</td>
</tr>
<tr>
<td>Mongire</td>
<td>6 0</td>
<td>550</td>
<td>–</td>
</tr>
<tr>
<td>Boia</td>
<td>8 2</td>
<td>350</td>
<td>–</td>
</tr>
<tr>
<td>Tungie</td>
<td>10 2</td>
<td>400</td>
<td>–</td>
</tr>
<tr>
<td>Makora</td>
<td>13 3</td>
<td>–</td>
<td>500</td>
</tr>
<tr>
<td>Yoyema</td>
<td>15 7</td>
<td>–</td>
<td>500</td>
</tr>
<tr>
<td>Moyamba</td>
<td>21 3</td>
<td>–</td>
<td>700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2,500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total 4,200*</td>
</tr>
</tbody>
</table>

**DESCRIPTION OF ENGINEERING WORKS REQUIRED.**

**Rotofunk to Moyamba.**

A girder bridge, 30 feet span, will be required across the Bumpe River, with masonry abutments 14 feet high, on solid rock foundations.

2 1/2 to 8 chs.5

* Or 200 people per mile of railway
Sierra Leone (Kwale) Railway Survey

A bank on a curve of 5 chs. radius, 8 feet high, rising 1 in 132 for 5 chs, where it will meet rising ground.

A surface line on straight and level for 4 1/2 chs.

Surface line containing a curve of 7 chs. radius and 7 chs. long, rising 1 in 60.

One 2 ft 6 in. culvert.

Surface line for 4 chs. and a bank of 10 chs. beginning at 0 and rising to 4 ft. high. One 2 ft. 6 in. culvert.

A girder bridge on 9 ft. high masonry abutments, and 18 ft. span is required. The stream, which, joins the Bumpe lower down, is in a rocky bed, and is rapid; good granite can be procured on the site for building.

Surface line rising 1 in 60 containing two short curves 7 1/2 and 8 1/2 chs. radius. One 2 ft. 6 in. culvert.

Surface lien dropping at grade of in 105, with a short curve of 10 chs. radius. This is a surface line 37 chs. long with a 3 grades, the steepest being 1 in 87 rising

A rising grade of 1 in 63, It first crosses a swamp with a 6 ft. bank on soft mud; here a bridge of 15 ft. span with concrete abutments and probably piling will be required. The bank is continued 20 chs., where it disappears, and a shallow cutting averaging 2 ft 6 in, will be required for 17 chs. The soil is of loamy sand, so cuttings or embankments will be easy. In this section two short curves of 7 chs. will be required.

All surface lien of easy grades, I in 112 being the steepest, and of which there is 1/2 a mile and 3 chains rising. In this length two 2 ft. 6 in. culverts and one 4 ft. will be required. One short curve of 3 chs. radius will be necessary at 3 miles.

A cutting 13 chs. long averaging 1 ft. 9 in. deep will be required on an incline of 1 in 81 23 chs. long, and 7 chs. will be a bank of 1 ft. 9 in average filling. / Of this length 20 chs. will be on an embankment averaging 2 ft. high. 5 chs. are on a curve of 6 chs. radius, and 4 chs. of 7 chs. radius, and a 2 ft. cutting will be required for about 4 chs.

This is nearly a mile drop of 1 in 60, having 3 curves of 6, 10, and 12 chs. radius. A cutting of 10 chs. long of 3 ft. depth, and an embankment of 7 ft. and length 15 chs. Two openings of 15 ft. ought to be left in the swamp with concrete abutments, and, as the swamp is soft, piles (which can be procured in the adjacent bush) will probably be necessary, and in this mile two 2 ft. 6 in. and one of 4 ft. culverts will be required.

This is a surface line contouring round the hill rising 1 in 111 for 20 chs. and dropping at 1 in 76 on a curve of 17 chs. radius for 20 chs.

Here there is surface line on the level, suggested as a site for a station. For many reasons it is not a desirable site, as it is on low ground with an incline rising each side, and it contains a curve 7 chs. long of 7 1/2 chs. radius. The buildings could be placed on the higher ground adjoining. A better site is to be seen at 4 8 to 12 1/2 chs.

12 1/2 to 30 1/2 chs.

30 1/2 to 45 chs.

45 to 49 chs.

49 to 70 chs.

70 chs. to 1 m.

1 m. to 1 m. 37 chs.

1 m. to 37 chs. to 2 m. 4 chs.

2 m. 4 chs. to 3 m. 60 chs.

3 m. 60 chs. to 4 m. 10 chs.

4 m. 10 chs. to 4 m. 44 chs.

4 m. 44 chs. to 5 m. 40 chs.

5 m. 40 chs. to 6 m. 0 chs.

6 m. 0 chs. to 6 m. 51 chs.
1/2 miles, but there is no water of be found near there. A 4 ft. culvert would be required through the place suggested for the station. A 40 ft. span bridge will be required over the river on masonry abutments with rock foundations, the abutments should be 10 ft. high.

The last 17 chs. of this section will be a rising grade of 1 in 103, and will be all in cutting, averaging 2 ft. depth, and on curves of 5 chs. radius.

This is practically a surface line 19 chs. rising and 19 chs. falling at 1 in 60, with a 5 chs. curve on the summit.

Here a swamp has to be crossed on a 5 ft. bank, 13 chs. long, and a bridge 15 ft. span with concrete abutments, and probably piles will be required. Half of this level bank will be on a curve of 5 1/2 chs. radius.

The line here rises 1 in 50 (compensated) for 35 chs. and crosses the ridge with a 5 ft. cutting at deepest part, the total length of cutting being 20 chs.

This is a drop from the summit of 1 in 63. A cutting similar to that on the east side of the ridge will be required, viz., 20 chs. averaging 2 ft. 6 ins. deep; two 4 ft. culverts will be required. In this incline are two curves, each 14 chs. long, one of 8 1/2 and the other 7 chs. radius.

The first 6 chs. are on a 5 ft. embankment over a marsh. Here a 20 ft. upon bridge will be required. There is rock for a foundation, and granite boulders with which the abutments can be built. They ought to be 8 ft. high. From here the line ascends as a surface lien for nearly a mile, with two grades I in 60 and 1 in 97, and one 4 ft. culvert.

This length, of 27 chs. of straight and level, I propose as a site for a station. From a working point of view the site is almost perfect, being on a summit where the train will be impeded on arrival and assisted when starting on either side.

This is a surface lien contouring down from the end of the proposed site for the station in tow grades of 1 in 260 and 1 in 90. One 4 ft. culvert is provided for this incline.

This section begins with a level and crosses over a deep ravine and river. At Tungie on each side are rivers, and another is met at 10 1/2 miles, but they all come together, and it is proposed to cross them lower down with one viaduct, 125 ft. long, but the spans may be of the most convenient dimensions, for the whole foundation is of granite rock. The piers, abutments, and wing walls can be of granite, which is to be found in large quantities on the site.

For the next two miles the line contours round the valley of the west river with easy curves, it is all a surface line, and rises with easy grade, with the exception of one quarter mile of 1 in 64. In these two miles five culverts of 4 ft. and one of 8 ft. will be required.

Here from the summit of a ridge the line has to drop 86 ft. to cross the deep valley of Makora. The grade is nearly all 1 in 50 (compensated), but allowance is
made for as many 5 chs. curves as are necessary. Some 4 ft. cuttings and embankments will be required.

The river will require a 30 ft. span bridge, with abutments 8 ft. high of concrete, the foundations will be found to be of stiff clay. A short distance further a swamp is crossed, but as there is no definite river, three openings of 4 ft. will be sufficient to take off floods.

This mile is a surface line rising at 1 in 50 (compensated) and two 4 ft. culverts will be required.

This 18 chs. of line is a level and on a summit, and except for the difficulty of water, would make a fine site for a railway station. It is about half way between Makora and Yoyema, both places of some importance.

This mile is a surface line dropping from the proposed station site with a 1 in 71 grade, and presents no difficulty. Two 4 ft. culverts will be wanted.

The first quarter of a mile will be a bank averaging 5 ft. through swamp, and here will be required a 15 ft. bridge with concrete abutments 5 ft. high. The next half mile will be a surface line, contouring the slope on the side of the valley. A deep valley has now to be crossed, which will require 10 chs. of 7 ft. embankment and two 15 ft. span bridges with concrete abutments on soft mud foundations.

One 4 ft. and one 8 ft. culvert will be required.

This section is a surface line rising in easy grades to 18 miles, and from there to 19 1/4 miles at 1 in 62 and 1 in 56. Seven culverts of 4 ft. will be required, and one of 8 ft.

At 19 1/4 m. the summit of the line is reached, being 292 ft. higher than at Rotofunk, and from there it descends to Moyamba 3/4 of a mile, being 1 in 55.

It is all a surface line except for short portions requiring 2 or 3 ft. cutting and embankments: four 4 ft. and one 2 ft. 6 in. culverts will be required in this length.

Throughout the line where there are cuttings they are through clay.

In some places a good deal of ballast could be found by washing the clay, which is largely mixed with laterite gravel. In any case there is laterite rock everywhere, and this can be broken up and used for ballest.

**Rtofnk to Moyamba.**

**Summary of Bridges and Culverts from Rotofunk to Moyamba.**

River Tungie at 10 1/2 miles. Allow three 40 ft. spans on masonry piers.

**Bridges.**

<table>
<thead>
<tr>
<th>Location</th>
<th>Foundations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bumpe</td>
<td>30 ft. span rock foundations.</td>
</tr>
<tr>
<td>At 1/2 mile</td>
<td>18 ft. span rock foundations.</td>
</tr>
<tr>
<td>Mongire</td>
<td>40 ft. span rock foundations.</td>
</tr>
<tr>
<td>Boia</td>
<td>20 ft. span rock foundations.</td>
</tr>
<tr>
<td>Makora</td>
<td>30 ft. span clay foundations.</td>
</tr>
</tbody>
</table>
THE FLYING SURVEY.

Moyaba to Mattru and Bo.

My instructions at first were that I should carry the reconnaissance survey as far as Kwalu and start from there on the flying survey to Mano and Tikonko. However, on March 29th, just as I had surveyed as far as Moyamba, which is 10 miles from Kwalu, I received your letter ordering me to start on the flying survey at once towards Mano and Tikouko and to return via Kwain. I was told that whichever route appeared to be the more advantageous was to be followed for the remaining ten miles still to be surveyed in connection with the reconnaissance part of the survey.

We accordingly started on March 31st in an easterly direction and reached Mano on the evening of April 3rd. The country, excepting only the first eight miles, is very easy and is more level than any we had surveyed between Rotofunk and Moyamba. Unlike the country we were accustomed to, the natives here cultivate boldly up to the edge of the road, so that a traveler has an opportunity of judgment whether the place be thickly inhabited or not, and in this case the indications of population were very satisfactory.

DESCRIPTION OF THE COUNTRY.

Moyamba to Bo.

After Moyamba the road runs nearly due south, the shortest road towards Mano. No change occurs in the physical features until 2 3/4 miles, where the river Bangue flows to join the Yambatu already crossed. This river at the road is 150 ft. wide, but lower down the railway can be made to cross at a narrower point. / Lunge. – On the south side is, or rather was, the village of Lunge. It contained about 300 inhabitants, but had to be burned by Government as a punishment for their action during the war. They too are beginning to rebuild, and in time will be as before. The temporary huts used by natives, after their villages are destroyed, last for about two dry and one wet season, say for eighteen months, and after they are past repair they usually return to the old sites to rebuild.

From this village the road rises 100 feet in about a mile, when it continues comparatively level until it drops to a swamp, at 5 miles, which is about 7 chs. wide, and is very deep. Another narrow swamp occurs at 6 1/2 miles. The road
for the last three miles contains a good deal of sandy loam, and the bush was not so high as the rest of the road, but here the laterite becomes more pronounced, and continues to show for the whole of the way to the end of our location survey. From 6 1/2 to 7 the bush becomes forest.

**Befu (7 miles).** – Here is the village of Befu, which was never a large place, but was almost obliterated by Government after the late war. It contained about 100 inhabitants, and probably will soon resume its former position.

After this village the road passes across a swamp about 10 chs. wide and rises abruptly, from 7 1/2 miles it is fairly level, till another wide swamp has to be crossed three-quarters of a mile further on and the village of Pehwahun is reached.

**Pehwahun.** – This village contains about 300 inhabitants, and as they remained friendly during the war, the place is now intact. Our reconnaissance survey extended beyond this place only with the object of finding a suitable site for a terminus for this section of the line, which we found about five furlongs to the east, after rising gradually at 29 1/4 miles by road from Rotofunk, where there is a junction with a road to Kwalu.

The road to this point is 29 1/4 miles long and the proposed railway 31 1/4 miles from Rotofunk.

**Mano** is 29 miles from Moyamba, and to get there we had to pass through 14 villages, a list of which is given further on.

Near the town of Mano is the large river of Taia, which is 480 feet wide, but contains a little lower down a natural rock causeway on which a bridge could be constructed. The piers could be made of granite of which there is a large quantity on site. This river and the Bangue at three miles from Moyamba are the only ones of great importance on the route recommended up to this point – Mano.

The town of Mano was burned during the late war, but it is rapidly rebuilding. It was said to contain about 2,000 inhabitants at one time, and I have no doubt will soon do so again, for the old occupiers are returning as their temporary huts become dilapidated.

It is not surprising that the natives should wish to return to their beautiful home, as Mano is a lovely spot, picturesquely situated on the magnificent river, of which long reaches are visible here and there from the town, framed, as it were, with brilliant foliage. The river itself is different to most found in the tropics for it runs bright and clear over its bed of rock.

From Mano we kept on still in an eastern direction till we arrived at

**Jama,** which was once a big place, but as it and the five other villages we met on this part of the road were burned, traffic had been diverted to other routes.

Jama may in time be rebuilt, but since the traffic has taken another and a shorter route it is doubtful whether the place will regain its former dimensions.
The country is very level by comparison, but there are some difficulties in connection with rivers and swamps.

This village is 42 miles from Moyamba, but as I suggest a better track for the railway we may pass on to a more prosperous neighbourhood.

*Mattru*, 17 1/4 miles from Jama and 58 1/2 miles from Moyamba by the road, is a place which remained friendly during the war, with the result that it was not destroyed and is now full of life and prosperity. It contains about 2,000 inhabitants apparently of considerable industry. There are many Mahommedans who make the collection of rubber and gum their principal occupation. They keep cattle, and I was struck with the excellent condition they were in. In fact all over this country where there are cattle the same feature is noticeable, and I think were there any facilities offered for disposing of them it would become a large and profitable business in West Africa. With the exception of numerous bridges the country to Mattru is very easy for a railway.

To carry out my instruction I went on to Tikonko, 5 1/4 miles further. This road also, like most of the country I inspected, is very easy.

*Tikonko* is 64 miles from Moyamba, and was at one time an important place, but as the natives rose up against us during the war and murdered the American missionaries, all their houses were burned, and Tikonko has since been completely deserted.

In former times the road from the important neighbourhood of Bandajuma passed through Tikonko, but since its destruction all the trade now goes via Gerihun through Bo, so that the abandonment of Tikonko appears to be permanent.

*Bo.* – On learning this I resolved to visit Bo, which is four miles north-east of Mattru, and I found it quite a city as compared with other places I saw. It is an immense place, and, like Mattru, remained friendly during the ‘War,’ and now contains 6,000 inhabitants.

The natives here are very primitive, and have not the least conception of the use of money; rice tobacco, and coloured European cloths being the only articles exchanged there.

The people appeared delighted at the prospect of the railway. It is about 14 miles from Freetown, and, of course, thousands here have never seen any signs of civilisation. Some traders told me the distance was so great that unless they could get carriers for no pay except their food, as the chiefs do, it does not pay them to carry produce to Freetown. /

Leaving Bo, we returned via Mattru, and then I resolved to take the shortest line to Mano. I returned in the way I came as far as Kendems, which is 49 miles from Moyamba, and 13 3/4 miles from Bo. This road to Mano (*via* Jagbama) is 3 1/2 miles shorter than the way we went (*via* Jama), and, moreover, we encountered fourteen villages on this route against only seven in the other. Soon after
leaving Kendama we found a curious plain, or ‘grass field,’ about 2 1/2 miles across and quite level, and, therefore, a most easy place for a railway. It is all a laterite formation, and during the rainy season the grass grows 6 or 7 feet high.

For the rest of the distance (13 miles) to Mano, it is a very thickly populated district, there being thirteen villages, and this is the main trade road [...]. We then proceeded to Kwalu.

Leaving Mano and following the road by which we came for seven miles, we reached Mabassiki, and thence turned north in the direction of Kwalu. This proved to be very desolate country as far as Kwalu. In this distance of 17 1/2 miles, four villages only were found, and they had all been destroyed. Makora was once a fairly good place, but the other three villages were so insignificant I could not even ascertain their names.

The road is level, but in this length there are 12 swamps.

Kwalu is a large place composed of three villages and said to contain about 750 people, but it is believed that when the district headquarters are moved from here to Moyamba the size of the village will be diminished.

From here to Moyamba – ten miles – the country is extremely rough, there is no village between the two places, though there are five swamps and some rivers. The first river met is the Bangue, 90 ft. span and 25 ft. banks, all in loose sand.

At 64 1/2 miles from Bo we reached the point at which we started the flying survey. Being quite convinced that the road by which I had travelled up country was greatly superior to the route by which I returned, we started at once to carry on the reconnaissance survey towards Mano until we found a suitable site for a temporary terminus at Pehwahun, nine miles from Moyamba.

The result of considering the two routes is that I suggest the shorter, more cultivated, and easier one, traversing the following villages:

<table>
<thead>
<tr>
<th>Miles from Moyamba</th>
<th>–</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Moyamba</td>
<td></td>
<td>700</td>
</tr>
<tr>
<td>2 1/2 Lunge</td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>6 3/4 Befu</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>8 Pehwahun</td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>11 1/4 Walliwaum</td>
<td></td>
<td>132</td>
</tr>
<tr>
<td>12 3/4 Kugan</td>
<td></td>
<td>132 (Burned.)</td>
</tr>
<tr>
<td>15 1/2 Misho</td>
<td></td>
<td>84</td>
</tr>
<tr>
<td>18 1/2 Taninahu</td>
<td></td>
<td>198</td>
</tr>
<tr>
<td>19 1/2 Mamalligi</td>
<td></td>
<td>144</td>
</tr>
<tr>
<td>19 3/4 Gegehun</td>
<td></td>
<td>132</td>
</tr>
<tr>
<td>21 1/2 Mabassiki</td>
<td></td>
<td>294</td>
</tr>
<tr>
<td>22 1/4 Sembehun</td>
<td></td>
<td>246</td>
</tr>
<tr>
<td>24 1/4 Kangehun</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>25 1/4 Nehti</td>
<td></td>
<td>186</td>
</tr>
<tr>
<td>25 3/4 Tembehun</td>
<td></td>
<td>86</td>
</tr>
<tr>
<td>28 3/4 Mano</td>
<td></td>
<td>2,000</td>
</tr>
</tbody>
</table>
**LIST OF BRIDGES AND CULVERTS.**

**Moyamba to Bo.**

(a) *Moyambo to Pehwahun:*—

(Reconnaissance Survey.)

**Bridges.**

River Yambatu at 1/4 mile. Allow one 50 ft., three 15 ft. spans.

River Bangue at 2 3/4 miles. Allow six 60 ft. spans.

**Culverts.**

15 feet span No. 4.
10 feet span No. 5.
4 feet span No. 11.
2 1/2 feet span No. 9.

(b) *Pehwahun to Bo:*—

(Flying Survey only.)

<table>
<thead>
<tr>
<th>Location</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>33 1/4 Yamahanu</td>
<td>120</td>
</tr>
<tr>
<td>34 3/4 Ruined Village</td>
<td>100</td>
</tr>
<tr>
<td>35 3/4 Jamawaioo</td>
<td>114</td>
</tr>
<tr>
<td>36 Kowama</td>
<td>126</td>
</tr>
<tr>
<td>36 1/2 Jubla</td>
<td>222</td>
</tr>
<tr>
<td>36 3/4 Kungo</td>
<td>114</td>
</tr>
<tr>
<td>37 1/4 Bahama</td>
<td>84</td>
</tr>
<tr>
<td>37 1/2 Moyamba</td>
<td>270</td>
</tr>
<tr>
<td>38 1/2 Bendabu</td>
<td>174</td>
</tr>
<tr>
<td>38 1/2 Gehoma</td>
<td>72</td>
</tr>
<tr>
<td>38 1/2 Godemma</td>
<td>138</td>
</tr>
<tr>
<td>39 1/2 Lunacena</td>
<td>216</td>
</tr>
<tr>
<td>42 Jagbama</td>
<td>180</td>
</tr>
<tr>
<td>45 1/2 Deserted Village</td>
<td>60</td>
</tr>
<tr>
<td>45 3/4 Do. (Kendema)</td>
<td>60</td>
</tr>
<tr>
<td>47 3/4 Sembehun</td>
<td>72</td>
</tr>
<tr>
<td>50 1/2 Natihu</td>
<td>84</td>
</tr>
<tr>
<td>55 1/4 Mattru</td>
<td>2,000</td>
</tr>
<tr>
<td>59 1/4 Bo</td>
<td>6,000</td>
</tr>
</tbody>
</table>

Total 10,206

- 5,064
### List of Bridges and Culverts with a Span of 15 feet or more.

<table>
<thead>
<tr>
<th>Distance from Moyamba by Road Miles Furlongs</th>
<th>Waterway required Feet</th>
<th>Height of Banks Feet</th>
<th>Nature of Foundations</th>
<th>Remarks.</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 4</td>
<td>25</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>28 4</td>
<td>48</td>
<td>– Rock.</td>
<td>–</td>
<td>River Tain.</td>
</tr>
<tr>
<td>33 2</td>
<td>30</td>
<td>– Clay.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>36 4</td>
<td>40</td>
<td>8 Sand.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>38 2</td>
<td>40</td>
<td>10 Sand.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>38 4</td>
<td>66</td>
<td>10 Sand.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>41 7</td>
<td>150</td>
<td>25 Rock.</td>
<td>River Jag-bama.</td>
<td>–</td>
</tr>
<tr>
<td>46 3</td>
<td>30</td>
<td>5 Rock.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>49 4</td>
<td>36</td>
<td>10 Blue clay.</td>
<td>Difficult bridge.</td>
<td>–</td>
</tr>
<tr>
<td>52 3</td>
<td>15</td>
<td>4 Clay.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>53 1</td>
<td>15</td>
<td>10 Hard clay.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>53 4</td>
<td>20</td>
<td>3 Mud.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>54 7</td>
<td>20</td>
<td>10 Stiff clay.</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>55 1</td>
<td>30</td>
<td>– –</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>56 0</td>
<td>30</td>
<td>3 Rock.</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Add for various swamps 41 bridges, 15 ft. span, with concrete abutments 5 ft. high, and piling.

Add also minor culverts, 2 1/2 ft. span, two per mile.

### DESCRIPTION OF ENGINEERING WORKS REQUIRED

**Moyamba to Pehwahun.**

(Reconnaissance Survey.)

The River Yambutu, a quarter of a mile from Moyamba, which is 80 ft. wide here, could be bridged with steel spans on masonry piers founded on solid rock. Plenty of granite is procurable for building.

A 5 ft. bank will be required for about 6 chs. length here, as the place is subject to floods.

It was found necessary to curve the line round the village to suit the contour of the country. Good sand for concrete and mortar may be got in this river bed. / Half a mile from Moyamba there is a level of nearly three-quarters of a mile, and it is proposed for a station, as no other site could be found near Moyamba. Though it is upon the wrong side of the river, as far as the new Government station and the village are concerned, I fear there is no alternative. If passengers were allowed to pass over the railway bridge, the station would be only a half mile distant.
At Lunge (3 miles) the River Rangue requires a viaduct. The wide and deep sandy-bedded river contracts in width lower down, where there is a rocky ford. The viaduct would be on granite rock, and all the material for building, except cement, is on the ground.

After this a high ridge has to be over, and unless another trace be discovered, it will be necessary to make a 16 ft. cutting on the admit of a grade of 1 in 50 (compensated). This would mean about 15,000 c. yds. of excavation, so I think it would be well to develop the line between the river and here.

Any place in the following mile could be selected for a station, for it is practically level and nearly all straight. I would suggest near 46 miles as being the most central of the possible sites available.

From 26 miles a surface line rises at 1 in 50 for about three-quarters of a mile, then continuing as a surface line drops at a grade of 1 in 103.

At the Befu swamp at 7 miles, three 10 ft. openings with concrete abutments and piers and a bank of 5 ft. for about a quarter of a mile will be necessary. The swamp is quite hard in the dry season, but during the rains it sometimes is under water to the depth of 3 1/2 ft.

From the edge of the Pehwahun swamp, a surface line ascends with a grade of 1 in 60 to 9 miles, and here upon a level is the proposed temporary terminus of this section. This is located upon a large plain where a good deal of clearing has taken place, and there is room for a triangle if it be desired.

GEOLOGICAL FEATURES OF THE COUNTRY.

The geological formation of the whole of the country is quite similar to that between Rotofunk and Moyamba.

All the hills are of laterite, and they form about two-thirds of the whole, the rest being composed of swamps and a loamy sand formation.

The swamps, of which there are 25, amount in the aggregate to two miles, varying from 2 to 15 chs. in width, and in calculating the bridges enumerated above, I dealt with each swamp separately, and allowed a 15 ft. opening for each 4 chs. of distance.

The whole of the bush, where not cut down for this year’s cultivation, is young, and indicates recent planting.

The population as seen in the villages must form but a small proportion of the whole, for the amount of cultivation visible everywhere indicates a great number of inhabitants.

I found it difficult to gather much information from the villages far up country, as they usually hide when they see Europeans coming, and as we approached several of the smaller villages a gong was sounded, and all the men of the place rushed to the bush and hid, until we were well past their village. I sometimes
heard the gong again after we got on our journey, which was probably meant as a signal that the men might now return without danger.

I was told that they fly from Europeans, and from the police for fear of being pressed into their service, and forced to become carriers against their will.

‘Overland Route.’ – I would suggest that both on the part I surveyed to Moyamba and over the district through which we made the flying survey, should construction to sanctioned, a temporary track with new rails be constructed at once. There is plenty of timber everywhere to make rough temporary bridges, and it would thus save the enormous cost of transport. On the 30 miles of country surveyed by our reconnaissance I see no reason why a temporary line could not be laid, and then the finishing work could be done much cheaper and faster.

Every means will have to be adopted to do so as much as possible with a minimum amount of labour, and this becomes more necessary in proportion as we penetrate further into the remote interior.

**TRAFFIC PROSPECTS.**

**General Remarks.**

The immediate development of traffic in passengers or goods, in my opinion, cannot be hoped for on account of the great disturbance caused by the hut tax revolt; but the ultimate result, when the natives become more settled down and enlightened, I believe will be satisfactory.

There is a very large population in the country, much more so than is generally imagined. The approximate populations were hitherto calculated by counting the inhabitants of all the known villages, but no allowance appears to have been made for the numerous dwellers in small clusters of huts and those isolated natives living deep in the bush remote from all towns or thoroughfares.

On every occasion when I penetrated the bush to any distance I discovered more people. The general impression is that those people really belong to the villages, and take up, as it were, a country residence for a time, for the purpose of cultivation. This is right, to some extent, for natives found near the larger villages, but most of those I questioned had never lived in any other than the place where I found them.

Again, the large amount of cultivation one sees in the interior indicates a population quite out of all proportion to the visible inhabitants, and it is for this reason I believe in the ultimate success of the railway. At present there is very little money amongst the natives, and, unfortunately, they appear to entirely disregard it. The reason appears to be that now, in the interior, there is practically nothing to be procured for money; but it is reasonable to believe that after the country is opened up by a railway, they will soon perceive that certain necessaries and luxuries can be obtained for the exchange of coin. As far as the line goes, the stations will be
surrounded by native traders who will form depôts where money will be given for produce, and the native will find he can select amongst the European commodities that which suits him, when in time money will be more appreciated.

As an example of how the people in the interior deal, I relate what happened in one village and which indicates generally what occurs in all the remoter places. One of our party being convalescent after fever, it was considered by our doctor desirable that a change in his diet should be made, so our head man was sent out to purchase a fowl at any price. There were several houses where he saw chickens, and though he offered prices twice as high as would be paid in London, they would hardly listen to him, and if he offered unlimited money I believe the result would be the same. Having returned to the camp unsuccessful, he went out again with tobacco, and for an amount worth a tenth of what he offered in silver he got the bird.

With such a feeling throughout the population, it would be unreasonable to expect passenger traffic at first, as there is practically no ready money in the interior to pay for it. But the education of races into the appreciation of money has always been found to be a short process, and in the near future, with such a vast population, passenger traffic is bound to grow.

The prospect of goods traffic, however, appears to be much more satisfactory, because produce will continue to come down country, and it is impossible that it could, for any length of time, be carried on the heads of natives parallel to the railway. No doubt there is still remaining a large element of slavery, so that chiefs in the interior procure their carriers in exchange only for their nourishment, but even the chiefs will probably soon perceive that it will pay them better to dispose of their produce to the traders who will be established at the end of the railway. A part from the fact that this system of slavery is rapidly disappearing, the value of rice and palm oil consumed by the natives, going and returning, would pay for the carriage of the produce on the railway. Take as an example Moyamba, which is 75 miles from Freetown. Between these two places a man’s journey there and back occupies 10 days, and a carrier’s support for that time on native diet costs at least 3d. per day. He has to carry his own rice, so that 50 lbs. of produce is the most he can deliver. This journey then costs 2s. 6d., equal to £5 12s. 6d. per ton, taking the worst form of slavery, and the loss to the master of the service of his man for ten days. There is a large amount of gum copal in the neighbourhood of Moyamba, and from here more is supplied than from any other place in Sierra Leone. The European traders I interviewed all told me the same, that in proportion as the natives grow more independent of their chiefs, the less the produce comes down, for not only the chiefs have more difficulty in procuring carriers, but also they are unable to get people to collect the material.

At such a distant place as this palm kernels are practically of no use. They are only worth about £6 per ton on the coast, and therefore cannot bear the rate of £5 12s. 6d. per ton for transport to Freetown.
[Note. – The palm kernels go to the coast ports where they form the principal export. See Colonial Secretary’s Statistics, September 1899 (Appendix B). S. & S.]

Some 60 miles farther up country there is rubber, but all the native traders I spoke to said the trade in it was almost quite undeveloped.

In looking at the existing map of the country, it will be observed that there are large tracts shown where apparently no roads or villages exist, but this is quite deceptive. These are merely places as yet unexplored, and are probably as thickly inhabited as are the well-known places. This I gather from the fact that wherever our party passed through such places they were found to contain populations quite as numerous as those in the better known districts, though shown on the map as if they were mere deserts. In all such places produce of some description is to be found, so that, in course of time, it will find its way to the railway. This appears obvious.

At present the natives have a custom of growing enough rice for their own consumption with a little more for the purpose of barter (in lieu of any currency), but were the railway to be near, and they found what a large price could be obtained for their labour by supplying Freetown, I think that that trade too would be soon developed. All such enterprise depends a good deal on the population, and as the country is so thickly inhabited, there is every reasonable prospect of a large goods traffic.

F.S.B. GAFFNEY. /

APPENDIX B.

05/15/1899.
Colonial Secretariat,
Sierra Leone,
2nd October 1899.

SIERRA LEONE (KWALU) SURVEY.

Sir,

In accordance with the request contained in your letter of 10th August on above subject, I have the honour to enclose a statement prepared by the District Commissioner, Sherbro, which, I trust, is what you want.

I have, &c.

J.C. GORE.
Col. Secretary
W. SHELFORD, Esq.,
35A, Great George Street,
Westminster, S.W. /

Custom House, Bonthe, T.J. ALDRIDGE,
## STATEMENT showing the Imports of Sherbro, Sulymah, and Mano for the Years 1896 and 1897.

### SHERBRO.

<table>
<thead>
<tr>
<th>Years</th>
<th>Cotton Goods</th>
<th>Hardware</th>
<th>Rum</th>
<th>Geneva</th>
<th>Whiskey and Other Spirits</th>
<th>Provisions</th>
<th>Tobacco</th>
<th>Miscellaneous</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£ s. d.</td>
<td>£ s. d.</td>
<td>£ s. d.</td>
<td>£ s. d.</td>
<td>£ s. d.</td>
<td>£ s. d.</td>
<td>£ s. d.</td>
<td>£ s. d.</td>
<td>£ s. d.</td>
</tr>
<tr>
<td>1896</td>
<td>21,804 11 1</td>
<td>3,551 3 10</td>
<td>27,600 2 1</td>
<td>3,067 14 11</td>
<td>30,272 8 6</td>
<td>1,400 1 10</td>
<td>1,759 3 5</td>
<td>17,544 1 7</td>
<td>64,110 0 9</td>
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<tr>
<td>1897</td>
<td>22,304 16 11</td>
<td>2,062 16 10</td>
<td>18,240 4 1</td>
<td>1,337 5 10</td>
<td>25,760 8 2</td>
<td>2,519 9 2</td>
<td>1,570 2 10</td>
<td>466,876 5</td>
<td>12,440 8 8</td>
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</table>

### SULIMA.

<table>
<thead>
<tr>
<th>Years</th>
<th>Cotton Goods</th>
<th>Hardware</th>
<th>Rum</th>
<th>Geneva</th>
<th>Whiskey and Other Spirits</th>
<th>Provisions</th>
<th>Tobacco</th>
<th>Miscellaneous</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1896</td>
<td>1,558 11 7</td>
<td>225 18 0</td>
<td>–</td>
<td>–</td>
<td>1,085 1</td>
<td>126 1 2</td>
<td>72 3</td>
<td>25 0</td>
<td>173 3 9</td>
</tr>
<tr>
<td>1897</td>
<td>1,629 3 5</td>
<td>221 1 7</td>
<td>–</td>
<td>–</td>
<td>429 3</td>
<td>46 0 4</td>
<td>47 6</td>
<td>25 4 1</td>
<td>13 1 6 2</td>
</tr>
</tbody>
</table>

### MANO.

<table>
<thead>
<tr>
<th>Years</th>
<th>Cotton Goods</th>
<th>Hardware</th>
<th>Rum</th>
<th>Geneva</th>
<th>Whiskey and Other Spirits</th>
<th>Provisions</th>
<th>Tobacco</th>
<th>Miscellaneous</th>
<th>Total</th>
</tr>
</thead>
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<tr>
<td>1896</td>
<td>1,780 12 7</td>
<td>320 10 0</td>
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<td>2,084 5</td>
<td>261 16 4</td>
<td>9 8</td>
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<tr>
<td>1897</td>
<td>2,963 13 2</td>
<td>339 13 5</td>
<td>1,050 8</td>
<td>115 16 2</td>
<td>1,690 5</td>
<td>173 13 9</td>
<td>31 4</td>
<td>14 7 7</td>
<td>126 11 4</td>
</tr>
</tbody>
</table>
STATEMENT showing the Exports of Sherbro, Sulima, and Mano, for the Years 1896 and 1897.

### Sherbro

<table>
<thead>
<tr>
<th>Years</th>
<th>Ivory</th>
<th>Kola Nuts</th>
<th>Lumber</th>
<th>Palm Kernels</th>
<th>Palm Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>1896</td>
<td>2 0 13</td>
<td>45 13 3</td>
<td>14 5 0 22</td>
<td>649 18 9</td>
<td>7,466</td>
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<tr>
<td>1897</td>
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<td>36 0 6</td>
<td>32 14 1 24</td>
<td>1,154 16 0</td>
<td>1,664</td>
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</tbody>
</table>

### Sulma

<table>
<thead>
<tr>
<th>Years</th>
<th>Ivory</th>
<th>Kola Nuts</th>
<th>Lumber</th>
<th>Palm Kernels</th>
<th>Palm Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>1896</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>1897</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
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</table>

### Mano

<table>
<thead>
<tr>
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<th>Ivory</th>
<th>Kola Nuts</th>
<th>Lumber</th>
<th>Palm Kernels</th>
<th>Palm Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>1896</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>1897</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Years</td>
<td>Rubber</td>
<td>Rice, Clean Native</td>
<td>Rice, Husk Native</td>
<td>Other Articles</td>
<td>Total</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>-------------------</td>
<td>------------------</td>
<td>---------------</td>
<td>-------</td>
</tr>
<tr>
<td>1896</td>
<td>160 27</td>
<td>91 37</td>
<td>23 17 38</td>
<td>237 10 6</td>
<td>25 3 18</td>
</tr>
<tr>
<td>1897</td>
<td>41 26</td>
<td>35 92</td>
<td>92 19 0 8</td>
<td>629 14</td>
<td>18 6 0 12</td>
</tr>
</tbody>
</table>

Sulima.

<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1896</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
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16th September, 1899. District Commissioners, in charge of Customs.
High Commissioner Sir F. Lugard to Mr. Chamberlain
(25 February 1903); held at the National Archives, CO 879/76/695, No. 41.

No. 41.

NORTHERN NIGERIA.

High Commissioner Sir F. LUGARD to Mr. CHAMBERLAIN.
(Received April 27, 1903.)
(No. 118.)
Kano, February 25, 1903.

Sir

I Have the honour to acknowledge the receipt of your confidential despatch of the 30th September, and of your No. 614 of the 17th October, and No. 716 of the 28th November, 1902, in which you invite a further expression of my views relative to railway construction in Nigeria. The correspondence on this subject has extended over so long a period that I trust you will pardon me if, to some extent, I unavoidably recapitulate the views I have, from time to time, put forward, with the bearing of subsequent developments upon them.

2. I have always maintained that the primary object of the railway both for commercial, administrative, and military reasons should be to connect Kano (vis-à-vis with the French at Zinder) with a point on the Niger which would be accessible for steamers all the year round, and for boats drawing six or eight feet at high water (vide despatch of the 18th August, 1899,† where I quoted a parallel opinion recorded by Lord Selborne’s Committee, of which Sir George Goldie¹ and Sir Ralph Moor² were members). Such a point can be found below the Kaduna mouth, but not above it, and recent investigations (vide attached report from the Director of Public Works and paragraph eight of this despatch) tend to show that Baro is the highest point which fulfils these conditions. All material for the construction of the railway can be brought to this port on the Kano to the Niger, not to the sea.
Niger by water transport, in vessels carrying from 500 to 1,000 tons, at high water, while vessels of less draught can reach it the whole year round.

3. I submit that on administrative, military, and commercial grounds, the necessity of this line is most urgent, and that its construction should be undertaken wholly independently of the Lagos Railway.

The goods which it will convey to the interior, and the produce which it will export thence will be carried by water transport. The Lagos Railway at present carries goods according to class at 9d., 6d., and 3d. per ton per mile, where there is no water competition, and where this competition exists, its rates are 4 1/2d., 3d., and 2 1/2d. – palm kernels at 2.16d. are recommended to be raised to 3 1/4d. – (vide Manager’s report for half year ending 30th June, 1902 page 6). Assuming, therefore, an average rate of 3d.per ton per mile, and that the railway reaches the Niger at the nearest point – Jebba – 322 miles, the cost of conveying a ton of produce to Lagos from the Niger will be £4. (A railway at Jebba, however, will not tap the main trade routes, and additional cost must be involved in conveying produce there or additional disadvantage incurred in its competition with water transport. If the Lagos railway came to Baro 50 per cent, would be added to the length of the line, and consequently to the cost per ton, which would then stand at £6.) I am sure, however, that produce can be conveyed at a profit from, say, Egga (a great traffic centre) to the sea at £1 per ton. (Mr. Watts, representing a Company which at present enjoys a monopoly, says about 30s.) In order, therefore, to compete with water transport it would appear that the railway would have to reduce its rates to a quarter (or a sixth) of what they are now fixed at in competition with water transport, at the most favourable calculation. I asked Mr. Eaglesome what are the known conditions of competition between water and rail transport, and he informs me that on the East Coast of India the railways have been carrying at three pie = 1/4d. per ton per mile to compete with water transport. It would seem to me that with the amount of produce which is likely to be available for a long time to come it is out of the question to suppose that a railway costing from £6,000 to 7,000 per mile can carry at anything like this rate, except at a very heavy loss. / Even at existing rates the gross earnings (including carriage of construction stores) only just exceeded working expenses without paying interest on capital, and this in the most densely populated and richest country which the railway will traverse. In considering any large extension of commerce there is also the additional cost of transhipment by means of branch boats over the Lagos bar to be taken into consideration, which will add considerably to the cost per ton as compared with water transport by the Night waterway.

4. Turning to the question of urgency, and the reasons for which I urge the importance of giving priority to the railway north of the Niger, they are as follows:

The French are pushing forward their line from Dahomey to Saye with great rapidity with the avowed intention of capturing the trade of the Haussa States (vide Intelligence Division, War Office, Memorandum of 15th May, 1902, Africa West, 647, p. 64, and Governor, Lagos, of the 9th April, 1901).” It was commenced

* No. 55 in African No. 647.
on the 1st May, 1900, and 108 kilometres were ready for the rails in one year, and it is said that it will be completed in three years' time. The Intelligence Division, War Office Memorandum, quotes data for the conclusion that £200,000 of merchandise has hitherto been brought down annually from Kano and Sokoto to Lagos. This does not take into consideration the great trade to the South done by the Niger Company, and by natives (which does not go to Lagos) nor the very great expansion which has taken place in the last three years since the roads were made safe by the Administration of Northern Nigeria, concerning which I hope to have a good deal of information to place before you in my annual report (1902). A British line, if constructed at once, would not only save the deflection of this trade, but would probably secure much of that from the French sphere, since the natives appear to prefer British routes to French. The important objects laid down in your letter to the Treasury of the 29th August, 1901, appear to be already greatly endangered. If the railway north of the Niger is postponed until after the Lagos railway reaches the river there will, of course, be a delay of several years. From Ibadany to Oshogbo is miles, thence to Ilorin and thence to the Niger 55. This 198 miles will probably take from five to ten years to construct the already constructed have taken seven years, and only covered 70 miles of the direct distance).

I may add that the efforts now being made by Residents to promote the growth of cotton, and the cultivation and collection of produce for export, will assuredly result in a great increase of trade, if only a means of transport to the Niger can be found, which will make it worth while to produce them in the interior, and this will make a corresponding increase in the revenue. As native manufactures are superseded by imported goods, it becomes a matter of urgency to provide new scope for their industry in producing produce for export, but in Northern Nigeria this produce, though valuable, is not such as can bear transport by men and animals for hundreds of miles.

The necessity for a means of transport for the supply of garrisons and administrative staff, at once cheaper and more certain than existing methods, is very urgent. Carriers are increasingly difficult to get, and it is an indication of successful progress that it should be so, for the adult labour returns to agriculture and to trade, with the cessation of slave raids and the increasing security afforded by the Administration. While regarding this with satisfaction, the inevitable dilemma is forced upon me of providing a substitute for absolutely necessary transport, for garrisons must be fed. &c.

(a.) By forced levies of carriers guarded by bayonets, a method repugnant to every British principle of rule and destruction of progress made.

(b.) By a large scheme of animal transport involving the construction of roads, and a considerable and costly organization of Staff.

(c.) By railways.

* No. 66 in African No. 647.
There is no question but that a combination of the last two forms the only tenable method, and it must be undertaken without delay to avoid the necessity of the first alternative. The system of carriers (besides being most costly) is moreover, altogether vicious. Chiefs when applied to for labour are apt to seize petty traders in the markets and confiscating their goods to assure the European that they are voluntary porters, while I have daily difficulties owing to the looting propensities of discharged carriers, who steal and rob the villagers in the name of the Administration.

(c) Military.

I have elsewhere pointed out the necessity for a means of rapid concentration of troops, increased mobility being equal to numerical increase, and saving at the same time a large unproductive expenditure on troops.

(d) Financially.

The cost to Government of providing essential transport, is enormous and increasing. A line on a 3-foot 6-inch gauge, of which the completed portion has so far cost from £6,000 to £7,000 per mile (the new extension is estimated at £7,000) will not be a very cheap method even if working expenses and interest on capital (without any provision for a sinking fund) are alone to be paid, but it will still be cheaper than present rates, which are about 2s. per ton per mile. The light surface line from Wushishi to Zungeru cost about £1,400 per mile, and repaid almost the entire sum in the saving of otherwise necessary transport in the first year. I have already alluded to the probable increase in exports which are at present not exportable, and the consequent increase in revenue which, in course of time, will, I hope render the Protectorate self-supporting. To hasten that time, you will concur with me, is a matter of urgency. The length of time taken at present by Officials in reaching, and returning from, their posts also cripples the Administration, and adds to its cost.

5. I have thought much over the points which I have ventured to lay before you, and with greater knowledge than I possessed a few years ago, with the result that I am compelled to somewhat modify earlier views. I realise now more fully the imperative urgency that exists for immediate railway construction, the importance of linking Lokoja with the Administrative centres of the Northern States, and the economy of utilizing water transport by the Niger, the more so that the latter exists while railway transport cannot be created for many years. I have come to the conclusion that a 3-foot 6-inch railway, which would cost at least 2 1/2 millions (350 miles), from the Niger to Kano, and probably another 1 1/2 million (200 miles), from Ibadan to the Niger, and would take at least 15 or 20 years to construct, does not meet the requirements, and is premature. (I do not include the cost of the Niger bridge, which need not be considered at present.) While such a railway was being constructed the objects in view would, to a large extent, be lost. The French railway will, it is said, be completed in three or four years. The Government of Northern Nigeria will have already spent enormous sums in archaic methods of transport, and should a difficulty
with France overtake us in the interval we should certainly be unable to maintain our position in the Northern States. I have naturally a keen desire to see this country self-supporting, to decrease the huge transport bill, and to increase the revenue-producing exports. I am convinced that the only method of doing this is by the rapid construction of a light surface line on a 2-foot 6-inch gauge, connecting the Lower Niger with Kano, or at least with Zaria, which is the central point from which the lines both of commerce and administration diverge. I have personally traversed the whole length of such a line, in company with Mr. Eaglesome, the Director of Public Works, who has a large experience of railway construction in India. From Baro to Zaria (excluding the Wushishi-Zungeru section) is 260 miles. There are no serious obstacles by the route selected, and thought no precise estimate, of cost can be made until after the location survey is complete, it may with tolerable safety be said that it will not exceed £1,570 per mile or a total of £410,000. Thence to Kano is a distance of 84 miles, the cost of which is estimated at £1,800 per mile (see paragraph 8) = £151,200. This gives a total of £562,000 for the whole line.

This surface line could be constructed to Zaria in four or five years, and to Kano in six or seven, if material were promptly delivered. Every yard that we opened to traffic would be a saving in carrier transport. I appears to me, moreover, premature to construct a line on so expensive a gauge as 3 feet 6 inches before the country has been thoroughly surveyed and, the approaches on both sides of the Niger from Lokoja to Leaba fully examined, and before we know fully its capabilities and arteries of trade. Very much has been learnt in the last year or two, but much remains to learn. The bulk of the present trade consists of articles, which have their origin in French West African and are not articles of import, viz. ‘potash’ and livestock, which come chiefly from Asben while the great Kola caravans come through French territory from Togoland.

I am not oblivious of the great bugbear of divergent gauges. The Crown Agents surveying the railway history of the world emphatically condemn the construction / of any light surface railways on a 2-foot 6-inch gauge, and point to the history of England and Australia, India, and America, as terrible warnings against the introduction of more than one gauge. It is, indeed, a matter of great importance, but there may bothers, such as time and cost, of even greater importance. Even assuming that the main trunk line were on a 3-foot 6-inch gauge, its enormous cost would only render it self-supporting if it had an equally enormous traffic, and that traffic can only be supplied, I venture to think, by extremely cheap feeder lines, the more so that the extension south of the Niger will have the steamer transport to compete against. For the cost of a 3-foot 6-inch gauge line it is possible to construct about five light surface lines of equal length. These costing about £1,500 per mile (of which £1,100 is for material) would have curves which no main line would contemplate, their rate of speed
need not exceed ten miles an hour, they would run only by day, and their fuel consumption, an important item when coal has to be imported from England to the heart of Nigeria, and costs 50s. to 60s. per ton (Lagos Manager’s Report) – and working expenses would be small. If the development of Nigeria justifies the supersession of such a line in later years by a main trunk line on a 3-foot 6-inch gauge on an identical route, the surface tramway can be taken up and laid elsewhere as a feeder, after distributing the material for the construction along the route of the main line.

6. Sir William Macgregor⁴ has urged the extension of the Lagos railway to Kano and Chad, on the grounds that the trade of Northern Nigeria was the ‘heritage’ of the Lagos people. I am fully in accord with him that such an extension would very greatly benefit the Lagos people, and that their enterprise and initiative deserves success, if they could pay for the cost of the line. But already they have reached the limit their financial resources. It remains, therefore, to consider how the line would best benefit the British taxpayer who pays for it, and Nigeria as a whole. It seems to me indisputable that a line feeding and not competing against the water transport, developing the trade now at the crucial moment, and not when it has already waned or passed into other channels, a railways whose expense are small, must be of greater benefit to the trade of Nigeria, and hence to Great Britain, than one whose construction will cost four millions at least (and more probably five or more), and which will, for many years, be worked at a loss. The Crown Agents, to whom you referred the question of a general railway policy, an say (in section 20 of their Memorandum of the 27th March, 1902)⁵ that the Lagos railway should only be constructed as far as it is found to pay, and again write as follows: ‘It appears to us that the extension of the Lagos railway should at present only be carried out to such an extent as will render it self-supporting, and that the vast area of Northern Nigeria should be served by a railway starting from some other point on the Coast.’ In their very latest dispatch (November 13th [? 15th], 1902. paragraph 3), they again express the view that the Lagos railway should support itself from the trade of the Lagos hinterland. I hope that the Lagos railway may eventually be extended to the Niger where it can take its own chance without favour or bias in the competition for the produce of the North. It will form a rapid route for passengers and mails ad urgent stores, and bring the central Administration of the Haussa States two or three days nearer Europe, and will save the waste of time (and salaries) which is necessitated by the present route, while in the case of a war with a European enemy on our frontiers the saving of time in the concentration of re-inforcements sent over-sea would be of importance. For these reasons I have always supported the extension of the Lagos line, chiefly for reasons of Imperial

⁴ Enclosure in No. 14.
defence and Administrative convenience, not for commerce, and still do so as far as the Niger, while urging that it is by no means so essential at present, or of anything like the urgency of the Northern extension (vide my despatch of the 11th May, 1900, and the 13th December, 1900)

7. I feel that even at the risk of being tedious, it is advisable that I should deal fully with this proposition. In your despatch, No. 685, of the 21st November, 1902, you informed me that you considered it inadvisable to incur any serious expenditure in connection with Zungeru lest it should not prove healthy. The expenditure already incurred is so great (and I may say that by the enthusiastic work of every one, so much has been done with the money), that in my view it is wholly out of the question to conceive the possibility of again moving the capital for many years, if ever. We shall shortly have erected 28 bungalows for Europeans, besides a large Hospital, Officers’ Mess, Supreme Court, and Government House. The Goal wall is a solid masonry structure of stone and brick, 12 feet high, and enclosing 2,000 square yards, the largest, probably, in Nigeria. Masonry bridges span the Dago stream, permanent brick barracks are in course of erection, Store houses, a Freed Slave Home, Clerks’ Houses, Stables and Outhouses of all sorts are springing up. The situation is admirably selected from a political point of view. Every new arrival expresses the same praise of it, and I do not remember to have heard a single contrary opinion. It is also considered healthy, and the last Medical return which has reached me shows, seven in Hospital at Lokoja and none at Zungeru, and, indeed the Hospital there has frequently been without a tenant. As regards health, however, it is beyond doubt that a change of air has a wonderfully beneficial effect in Africa. Europeans are frequently sent for a health trip from the comparatively healthy climate of Lokoja to the mangrove swamps of Burutu with good results. If it were possible to run up to Zungeru or down to Lokoja in 18 hours by rail and steamer it would be a most valuable restorative to health, and probably save many invalidings to England. But if ever the capital were moved it would certainly be in a north or north-easterly direction, so that the construction of this surface line would be equally valuable for the new, as for the present capital.

The necessity for rapid communication with Lokoja I have already alluded to in general terms. The minimum time at present taken is seven days by mail runners. By rail to Baro and thence by steamer it would take 18 hours only. Serious delay is thus incurred in the transaction of work, and a waste of valuable time during which African pay and allowances are being drawn. Departments are practically reduplicated at Lokoja and Zungeru, and the difficulties of Adminis-
The section of tramway from Wushishi to Zungeru is estimated to have carried fully 10,000 tons of Government Stores and material already. This by carrier transport (at 2s. per ton per mile) would have cost £12,000, while the cost of the section was only £16,800, and it is the most difficult section between Zungeru and Baro. The Bari-Juko section was delayed, owing to the abnormal difficulties we have experienced this year, owing to the lowness of the rivers, but it is now completed and open. Transport from Baro to Bari-Juko may be estimated to cost at present on an average throughout the year (say 10s. for three months and 25s. for nine months), about 3 1/4d. per ton per mile. If this rate were charged by a light line between these two places, the Director of Public Works calculates that after paying working expenses the tramway would certainly pay 5 per cent. on the capital expenditure, if the freight of produce and earnings from the Niger Company and natives be added. I trust that these facts and figures will convince you of the urgency and economy of constructing this section from Baro Zungeru without delay. With the highly expert knowledge of Mr. Eaglesome and Mr Scott it can be undertaken by the Protectorate Staff.

8. As regards the route to be adopted I am now able to place before you more definite information.

The Niger appears to flood great areas on one or the other bank through the greater part of its course above Lokoja. The attached report by Mr. Eaglesome consequently excludes the stretch between Shonga and Baro from consideration in the selection of a route across the river from south to north. Probably throughout this section of the river, and certainly from Baro to some distance above the Kaduna mouth, these flood areas extend along the northern or left bank, while at Egga the river floods on both sides. Baro (Siebong on the map) therefore is the / first point at which a railway – at any rate a surface line – from the Niger northwards can start. Here is an admirable place for a port with two fathoms of water at low river. It is the crossing place of a large caravan route from

* No. 31 in African No. 713 (Expedition to Kano).
Argeye, through which place the line would pass on its way to Bida, cutting the still more important route which debouches at Katsa. It is 90 miles from Baro to Bari-Jukko, over easy ground, the only obstacle of any importance being the Bako River. The cost, including bridges and a small rolling stock, would not exceed £1,500 per mile. I shall presently have an accurate survey made by Mr. Scott (than whom it would be difficult to find a more capable man with much experience of such work), so that a precise estimate of cost can be made. The essential point is to connect the head-quarters with a port on the Niger which can be reached by steamers doing the journey from Burutu and back again within the fortnight. Our present steamers can easily reach and return from Baro in this period, but could not reach a point much further up stream. Since it appears that any increase of speed in the larger vessels is not practically obtainable, Baro would form the most economical point possible for the working of the river flotilla which can just reach it and return in time to meet the weekly ocean steamers. The river service would therefore work in admirably with the railway service, and effectively connect Burutu, Lokoja and Zungeru. Finally, as regards this section, I would point out, that if you should over-rule my proposals regarding the main line and should consider that the Lagos 3’ 6” gauge line should be constructed north of the Niger, that line would come presumably from the south-west to Jebba, Rabah or Shonga, and touch at Zungeru, in which case it would, in no way, form a connecting link with Lokoja, while the surface line from Baro would form an invaluable means of transporting the material for its construction to Zungeru, and so enabling that construction to be taken up at that point, which would (as Mr. Gee says) ‘form an immense saving of time over the slow process of railhead construction.’

Turning to the further extension northwards of the surface line. The Kaduna offers no serious obstacle, and a bridge over it is essential in any case as part of the road communicating with our garrisons to the north. I have therefore included the greater part of its cost under the Public Works Department Extraordinary estimates for next year. It will not exceed £5,000 in all. Thence to Zaria as I have already stated there is no special obstacle, and it is estimated that the average cost per mile will not exceed £1,570. I shall shortly forward to you a more detailed description of the route with plans.

This section is the most difficult in the whole line from the Niger, and involves some eight bridges, exclusive of minor streams, in all about 1,250 lineal feet of bridging. The country, however, is level and easy. The cost of construction of this section will be about £700 per mile, viz., £1,800, including material. Its length is 84 miles, giving a cost of £151,200.

The whole line from the Niger to Kano therefore can probably be constructed from £562,000 (as stated in paragraph 5) spreading over six or seven years, and the more essential part from the Niger to Zaria for £410,000, spread-
9. The proposals I have made are based on the following considerations:—

(1) That the surface line will be only one-fifth of the cost of the larger gauge, probably much less, for the larger line will become more and more costly as it progresses further into the interior, and its cost will probably considerably exceed £7,000 per mile. The working expenses will be trifling in comparison, for the line will be content with the lowest speed, and its fuel will be less costly. It will compete with human and animal transport, and for many years to come will suffice to meet the needs of the country.

(2) Perhaps, however, the paramount advantage is its rapidity of construction, in view of the reasons for urgency which I have given.*

(3) In view of its cheap construction, and comparatively small working expenses, it can afford to carry at low rates. The produce to be conveyed can only stand low transport rates, and a farthing per ton per mile, more or less, may, for instance, decide the question as to whether the Hausa States can or cannot become one of the great cotton exporting countries.

(4) It will connect Lokoja and Zungeru, a matter of the first importance from an administrative and military point of view. The Lagos railway cannot do so unless deflected 120 to 150 miles out of its way, at an additional cost of another million, and with traffic rates consequently increased by nearly 50 per cent. per ton per mile.

(5) Its object would be to serve the water transport, not to compete against it, to the great advantage (as I maintain) of the progress of trade, and the development of the revenue.

10. There is, of course, an alternative to the proposals I have made, which is that a 3’ 6” gauge railway should at once be constructed from Baro to Zungeru, and carried northwards, but I deprecate the delay which would occur in constructing such a railway at present. If, however, this suggestion meets with your approval, the water transport, or whether it should eventually link up with the Lagos railway. If the latter, then the Lagos line should run eastwards from Oshogbo to a point somewhere opposite Baro, which may be selected as bridgeable. This would add a section about equal to half its entire length from Lagos to Jebba, viz., a million and a quarter sterling, to the length and cost of the line, and I doubt whether it would, with this extra burden, have any chance of competing with improved water transport. Still it would appear to be a more feasible pro-

* The Lagos railway has hitherto progressed at the rate of 10 miles per annum of direct distance towards Kano (17 1/2 of actual rail). Assuming a line to start from the Niger on this gauge and to make double the rate of progress (through construction will be slower the further railhead is from the base) it would take 18 years to reach Kano, and the Lagos railway would take another 10 to reach the Niger, disregarding the Niger bridge.
posal than that made by Mr. Gee, who, speaking of the central position of Lokoja, remarks that ‘a branch line of only 200 miles’ would connect it with Oshogbo. It would surely be more sensible to bring the main line within a reasonable distance of Lokoja than to carry it to the west through a sparsely populated country, where there are few trade routes, and to contemplate a branch line of more than half its whole length (total length to Jebba, 323 miles; length of branch, 200). Niger bridge.

11. The length to which this despatch has extended leaves me little space to express my views on the many questions connected with this subject. You have approved of the extension of the Lagos Railway to Ilorin, and I presume, therefore, that it will reach the Niger somewhere in that direction, since the section between Shonga and Baro appears from Mr. Eaglesome’s is report to the eminently unsuitable, and a point opposite or below Baro would, as I pointed out in the last paragraph, add 120 miles of direct distance, and probably at least 150 of actual construction to its length. I would strongly urge that the approaches to the river between Shonga and Jebba should be thoroughly examined, and borings taken in the river bed. Mr. Gee appears to have felt himself bound by his instructions to consider no place that had not a rock bottom, and though in his very able report he pronounces Jebba ‘the best possible site,’ he adds the words, ‘should you be disposed to modify and somewhat relax the stringency of your instructions under which I worked as to rock bottom, and foundations, &c.’ Though I advocate that the Lagos Railway should not at present be extended north of the Niger, it should, if extended to the river, undoubtedly debouch at the point which has been decided upon as the most feasible for bridging, and from thence northwards a feasible line for a main trunk line may in the future be built, should such an extension prove desirable by the light of fuller experience. Seeing that this point must be at or west of Shonga, I have no hesitation in saying that from the commercial and administrative point of view, Shongan (viz., the most easterly point possible) would be the best. If cheapness of construction is, however, the ruling consideration, then a point above Jebba where rocks emerge may be better, even as far as Leaba, where the whole channel is only 230 yards broad, and which is 12 miles further west. Mr. Eaglesome, whose report I attach, appears to consider that a multi-span bridge built up from caissons in a bed of deep sand or clay would be cheaper and better than one built on rock bottom at considerable depth. I can easily arrange to have a survey made of the country between Shonga and Zungeru from a railway point of view, by Mr. Eaglesome or Mr. Scott, which will ascertain its practicability. I do not anticipate that any serious difficulty would be met with. The crossing from Kasogi to Shonga and Lafiaji is one of the most important caravan routes from the north. The actual construction of the bridge need not, I think, be contemplated for another half century, and certainly not before a 3’ 6” gauge railway reaches Kano (vide my
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despatch of the 9th April, 1901†). Meanwhile, a waggon ferry, or a steamer, or a bridge of boats (as at Attock over the Indus) will amply serve the traffic of the railway. I submit that this question of the bridgeable point on the Niger is one which it will take a year or two to solve by itself, and it is not the least of the advantages of the scheme I have proposed that it can be put in hand at once, without this necessary delay.† If the railway crosses at Shonga, and is eventually extended to Zungeru, it will officer all the advantages to the Administration which I dwelt on in paragraph 6, and it will there tap the produce brought down from Kano, &c., by the surface line, and can (if it is able to do so successfully) divert it from the Niger steamers.

Port for Niger. 12. As I have no knowledge at first hand on this subject, I have not ventured to express any independent view. At the meeting on the 9th April, 1901, between Sir William MacGregor, Sir Ralph Moor and myself, I found a strong divergence of opinion, the former advocated Lagos as the port of Nigeria, the latter Sapeli (or Warri), and Old Calabar. I ventured the suggestion that as the railway from Lagos had already reached Ibadan, and had its workshops and depots already in operation, the question as to whether it should not for the present remain the port appeared to be beyond discussion, but that a branch line might be made to Sapeli (despatch of the 9th April, 1901‡). Sir Ralph Moor (despatch of the 25th April, 1901§) cordially endorsed this suggestion, proposing that the branch should be from Oshogbo. It appears to me premature to discuss this matter, but I should certainly be inclined to think that a railway from Sapeli to the Niger at Baro, 200 miles in length, running with the watershed, would be vastly more useful and probably not more expensive than a branch in competition with the Lagos line crossing the watershed at right angles, and only 45 miles less in length. I may point out that the distance from Ibadan to the nearest point on the Niger (Jebba) is given by Mr. Gee as 198 miles, while the Sapeli line would be only 200 (or direct distance) to Baro, and that Mr. Gee’s proposed branch to Lokoja is the same length.

Sir Ralph Moor, who speaks with unrivalled experience on the subject of ports, appears to me in his despatch of the 17th January, 1901,† to show conclusively that Lagos is exceedingly unsuitable for the eventual port, not merely on account of its bar, but for reasons of health, drainage, water supply, and area. Sir William MacGregor deprecates any expenditure on the Lagos harbour until after

* No. 53 in African No. 647.
† I may note that my proposals that the bridge should be in the neighbourhood of or below the Kaduna mouth have been taken rather ludicrously au pied de la lettre. I certainly had no intention of recommending that spot.
‡ No. 60 in African No. 647.
§ No. 41 in African No. 647.
¶ No. 13.
High Commissioner Sir F. Lugard to Mr. Chamberlain

The railway has reached Kano, and states that the present system will suffice till then. But it must be remembered that the cost of this system adds greatly to the total transport charges on produce exported, as would also the interest on the million sterling required to convert Lagos into a port, and I have already shown that even apart from this the railway can hardly compete with water transport.

The Crown Agents, in the passage I have quoted in paragraph 6, say that 'the vast area of Northern Nigeria should be served by a railway starting from some other point on the coast.' A line from Sapeli could tap the great centres of Lokoja and Onitsha.

13. The view put forward by Sir Ralph Moor and myself that the Western Railway could not alone adequately develop Nigeria, or meet its administrative needs for communication, has, I gather, received your general concurrence. I desire however to point out the essential difference in the general scheme put forward by myself on the one hand, and by Sir Ralph Moor and the Crown Agents on the other. They propose that the line should go from Old Calabar to Loko (or Ibi), thence to Bautshi (Yakoba) and Kano, thence to Chad. It would be almost or quite as serious an undertaking to bridge the Benue at Loko as to bridge the Niger, while the ascent of the Murchison Range and the crossing of the interminable hills of Bautshi (itself 3,000 feet) would be a gigantic task. The existence of this escarpment was pointed out in my despatch of the 1st March, 1902 (Enclosure 2). Nor is there any trade worth speaking of at Bautshi or any centre of population. Its trade was chiefly in slaves. I at first suggested Ibi as the lowest point for crossing the Benue, but, looking to the swamps in that neighbourhood and the ranges of hills immediately to the north of them, it would seem to me not improbable that the Calabar Railway ought to trend further east towards Lau (on the Benué), and thence passing eastwards of the Bautshi escarpment, ascend the Gongola valley and traverse the plains of Bornu to Kuka. Such a line would no doubt tap the trade of the Kameruns hinterland and form a strong strategic line on our eastern frontier. Kano will be fully served by the other line.

14. As a result of the unanimous proposal of the Administrators of Nigeria that a general railway policy should be laid down, you referred the matter to the Crown Agents.∗ But in effect their reply and that of Messrs. Shelford (of the 27th March, 1902†), is that, without further data to work upon, they cannot lay down any such policy. I cannot see that they could have given any other reply, since their knowledge of the country appears extremely meagre, as in the case of the proposal to build a railway over the Bautshi ranges via Loko, and their allusion to ‘the two’ trade routes in Northern Nigeria (Sokoto-Jebba and

Eastern railway.

General railway policy.

* No. 70A in African No. 647.
† No. 14 and enclosure.
Kano-Egbom). The Protectorate is a network of trade routes, a chart of which I shall submit with my next annual report. My own knowledge of the physical configuration of the country is still so imperfect that it is with diffidence that I have expressed the views contained in this despatch. Briefly, they are as follows:

(1) That the paramount urgency is to build a line from an accessible port on the Niger, connecting Lokoja and Zungeru, and traversing the main lines of trade and centres of population; that this line, for reasons of rapidity in construction, and economy in working should be on a 2’ 6” gauge, and a mere surface line. That, starting at Baro, it should be extended to Zaria at a cost of £410,000, and in a period of four years, so as to anticipate the French line to Saye.

(2) That later, if it be considered that a railway can compete with success against water transport, a line from the south, probably from the port of Sapeli, should be constructed serving Onitsha and Lokoja, and reaching the Niger near Baro. A waggon ferry or bridge of boats will serve instead of a bridge for very many years, and if the produce and trade of the north justify it, the main trunk line can be extended northwards along an easy country, superseding the 2’ 6” line, which would be taken up and used elsewhere as a feeder line.

(3) That in accordance with the Crown Agents’ dictum, the Lagos line should only be extended so far as it will be self-supporting; possibly this may necessitate its reaching the Niger at Shonga (some ten years hence). It will then be time enough to decide whether it shall be extended northwards as far as Zungeru. I am, however, much inclined to think that the money spent on the 200 miles of construction form Ibadan to Shonga or Jebba would be better spent on constructing a line of equal length from Sapeli to the neighbourhood of Baro.

(4) The points at which the big lines touch the Niger should be the ones selected for bridges (whether between Shonga and Leaba, or in the direction of Baro), though no bridge need be contemplated for 50 years. To ascertain these points, careful surveys of the approaches should be made, and the results submitted to a committee of experts.

(5) A feel little doubt that the line Sapeli-Baro-Bida-Zungeru-Nassarawa-Gwari-Zaria, is the best and most feasible line for a railway from every point of view. It will traverse populous areas, pass the main centres of trade, and connect with the river transport. Of this, the section north of the Niger should be constructed wholly independently of the southern section (which is doubtful and not urgent), material being brought by water transport to Baro.

(6) That the eastern railway should start from Old Calabar and cross the Benue at or above Lau, and thence proceed up the Gongola to Kuka or Chad.

(7) While contemplating that lines from the coast to the Niger may eventually connect with those to the north, I desire to emphasise once more most strongly my view that the northern line with a port on the Niger and connecting with the river transport should be independent of any such connection, and that
a through line to the coast would be mainly valuable for administrative convenience and for strategic reasons. Time and experience alone will show whether the connection would also be of commercial value, and supersede water transport.

(8) If my proposals meet with your concurrence, the costly survey to the north of the Niger, for which provision has been made in the estimate of next year will not be required.

15. The Crown Agents complain that they have little information from Northern Nigeria, which must form my apology for the inordinate length to which this despatch has extended, and which precludes my making any detailed comments on theirs, and Messrs, Shelford's and Gee's reports; I add therefore only the following brief notes:–

(1) Caravan traffic on Illorin Road. – Mr. Gee's figures for one month cannot be multiplied by 12 for the year. Traffic practically ceases during the rains. I hope to give some statistics in my annual report.

(2) Mr. Grey's route. – I trust that the statistics I am collecting, which will give the result of 18 months' careful study of the population, produce and volume of trade, will prove of more than the notes of a casual traveller, even though he be as shrewd an observer as Mr. Grey has shown himself to be. The statistics of exports contained in my report for 1901 show that many of the products indicated by Mr. Grey as of value for export have been developed for years past. Mr. Grey is rather apt to lose sight of the cost of carrier transport. Mr. Gee, quoting Mr. Grey, says that there are no difficulties between Zaria and Kano. It is inferred that Mr. Grey visited Kano. He was driven back at Bebeji on the Kano frontier, and one of his carriers, who was suffering from guinea worm, I am informed, died as a result.

(3) Crown Agents, paragraph 29. – There are no 'tropical forests' between Illorin and Jebba; sparse jungle and open country alternate. The line from Ibadan to the Niger must, of course, cross the watershed between the country drained towards the sea and that towards the Niger.

(4) Headway of bridge. – Need not be considered if the bridge is at or above Jebba; if below, a swing span will be necessary, about which I believe there should be no especial difficulty.

(5) Mr. Gee's section 2 (1). – I have already reported the seven years' flood, &c. I said the Niger was not liable to sudden floods, viz. that it rarely rises more than, say, four feet in 24 hours. The height of the 1900 flood is also recorded at Lokoja.

(6) Messrs. Shelford's sketch with report of the 13th November, 1902, shows the 'zone of construction, 1903–05,' up to Zaria. I cannot conceive how it is supposed that Zaria (270 miles from the Niger) would be reached in two years.
I will shortly submit to you a report and sketch by Mr. Eaglesome on the entire route from Baro to Kano.

I have, &c.

F.D. LUGARD,
High Commissioner.

Printed for the use of the Colonial Office.

WEST AFRICA.

African (West)

No. 765.

CONFIDENTIAL.

PAPERS

[August 10, 1903 to August 12, 1904.]

RELATING TO

CONSTRUCTION OF FOREIGN RAILWAYS IN WEST AFRICA.

Colonial Office,

March, 1905. /

[...]
No. 1.

FOREIGN OFFICE to COLONIAL OFFICE.

(Received August 11, 1903.)
(Confidential.)

Sir, Foreign Office, August 10, 1903.

I am directed by the Secretary of State for Foreign Affairs to transmit to you, to be laid before the Secretary of State for the Colonies, the accompanying despatch from Captain Cromie, transmitting a report on the Dahomey Railway.

I am, &c.,

F. H. VILLIERS.

Enclosure in No. 1.

Captain C. F. Cromie to the Marquess of Lansdowne.

(Separate, Africa)

My Lord, Lagos, May 25, 1903.

I have the honour to transmit herewith, for Your Lordship's information, a report I have drawn up on the railway now under construction, and partly worked, in the French Colony of Dahomey.

During my recent visit to that Colony I was given every opportunity to inspect the line, and the officials were most courteous in giving me information.

I should be grateful if Your Lordship would cause a copy of my report to be forwarded to the Director of Military Intelligence.

I have, &c.,

C. F. CROMIE,

The Most Noble
The Marquess of Lansdowne, K.G., Captain.
&c., &c., &c. /

REPORT ON THE DAHOMEY RAILWAY.

Starts from the port of Kotonou, on the sea coast, and is to be continued to Karimana, near Say, on the River Niger. A short branch connects with Whydah.

In May, 1903, there were 103 kilometres open for traffic, i.e., from Kotonou to Toffo, on the main line, 88 kilometres, and the branch from Pahou Junction to Whydah, 15 kilometres.
The roadbed, without permanent way, is completed to Atcheribé, some 50 kilometres north of Abomey, and about 90 kilometres beyond Toffio, the present railhead.

The principle of construction adopted is as follows:—

(1) The roadbed, including culverts, bridges, cuttings and embankments is constructed by the military engineers at the cost of the Colony;

(2) When ready, it is handed over to the Railway Company, which has to lay the permanent way, build stations, &c., and work the line.

In return for this the Company is to receive an annual subvention of 2,000 francs per kilometre of line being worked for a period of six years from the date of opening for traffic, and in addition a territorial concession of 295,000 hectares of waste and unoccupied lands.

In the event of the gross receipts exceeding 6,000 francs per kilometre, the Colony is to receive a share graduated from one-third to one-half of the nett revenue.

Difficulties having arisen as to the territorial concessions, the Railway Company will probably receive a money compensation in lieu of them.

Country passed through.

Starting from the pier at Kotonou the line follows the coast in a westerly direction as far as Pahou, where it crosses the lagoon. From Pahou there is a branch 15 kilometres long to Whydah, and the main line turns directly north, following the watershed between the rivers Couffo and Sô. From Toffo to Kissa, a distance of 15 kilometres, the great Lama marsh has to be crossed, after which the line rises to the Abomey plateau and descends on the north slope to the river Zou, at Atcheribé, which is crossed by an iron bridge. Thence the line again rises to the plateau which extends from Paouignan to Parakou.

From the coast to the 27th kilometre the country is sandy and marshy, with scattered clumps of oil and fan palms. From the 27th to the 88th kilometre is a belt of dense tropical forest, very rich in oil palms. This belt is impassable except by native tracks, the dense undergrowth and creepers making penetration practically impossible elsewhere.

Between the 88th and 103rd kilometre is the Lama marsh, caused by the overflow of the Onémé and Couffo rivers, and which cannot be turned. This marsh is covered with dense vegetation, and is not easy to pass at any time – in the wet season it is virtually impassable. The line is carried across it on an embankment, except at one spot near the centre, where there is a piece of rising ground through which a short cutting has been made. The soil is treacherous and unstable, and at present the embankment is quite unfit for traffic, and has been refused by the Railway Company. It will probably have to be rebuilt on a sound foundation, which will take a long time and be very expensive. In the meantime,
the railway is at a stand-still, as it cannot proceed until the Lama embankment can be safely used for traffic.

From kilometre 103 the line rises gradually to the Abomey plateau, which at Dau attains an elevation of 248 metres, or over 800 feet. The country is now more open, but still consists of forest with numerous clearings for cultivation, which gradually increase in number and extent as the neighbourhood of Abomey is approached. The principal crops are maize, millet, cassava, beans of many varieties, and some ground-nuts. This part of the country is very deficient in water, and the natives have to go long distances to fetch it.

Single line, metre gauge. Rails single headed, 9 metres in length, weight, 200 kilos (about 43 lbs. per yard).

Steel sleepers, 12 per rail of 9 metres. The rails are bolted to the sleepers through two holes at each end of sleeper. Rails bolted together with fish-plates.

Points, counterweight, moving horizontally.

There are few bridges of importance. What will be the longest on the line is in course of construction over the river Zou at Atcheribé. It will be 95 metres in length. They are all of the same type – masonry columns carrying steel girders, which support the rails. No pathway or railing.

Near the Toffo side of the Lama marsh is a two-span bridge.

With the exception of the long embankment over the Lama marsh, and some in the marshy district near the coast, there are few embankments.

Beyond the sandy coast belt the embankments are all made of a very binding red laterite soil, which dries very hard and is little affected by water action if reasonable repairs are executed.

The Lama embankment, however, which is in very bad condition and liable to melt away under the influence of heavy rain, was made of the soil excavated from the marsh itself to avoid the heavy expense of transporting laterite soil. As there is no stone in the country there was no material available with which to make a solid foundation. I am informed that there is no stone nearer than Paouignan.

Cuttings are few in number, and owing to the firmness of the laterite can be made at a very steep angle without danger of slipping.

Buildings.

All station and other buildings consist of a steel framework sent out from France, filled in with cement blocks about 1 ft. cube, made at Kotonou, of one part cement to 3 parts sand.

Station buildings are divided into three classes:–

1st class. – Consist of a ground-floor, raised one metre from the ground, on steel and cement pillars, with a free circulation of air underneath; and an upper
storey: five rooms on each floor with a verandah all round. The upper storey is used as a residence for European employés.

2nd class. – Similar to 1st class without the upper storey.

3rd class. – Slightly raised off the ground on a wall, no upper storey, and only three rooms.

No platforms have yet been made, that at Kotonou being in course of construction. It will consist of concrete retaining walls about 1 ft. 6 in. high, filled in with laterite, and will be about 50 yards long by six wide.

*Watering Stations.*

At Kotonou, Pahou, and Toffo, water is obtained from wells, pumped by hand to raised cisterns by the side of the line. The water is also used for drinking purposes.

There is also a cistern at kilometre 91, which is supplied from the Lama marsh, but since the well has been dug at Toffo this has ceased to be used.

The water question promises to be a serious one, as there is practically no water on the Abomey plateau, where deep wells have been sunk without reaching it. The Government propose to try artesian wells, which may possibly prove to be the solution.

The large engines carry sufficient water to make the journey to Toffo and back with the existing watering stations, but the light engines have to be accompanied by a tank waggon, of which there are two.

*Rolling-Stock.*

Three tank engines of 30 tons weight, numbered 1 to 3, and a fourth is on order. Four small tank engines of about half the weight, lettered A to D.

All rolling-stock on the bogey principle.

Composite 1st and 2nd class carriages, with lavatory accommodation between, and the door in the centre. These are very hot, as they have neither hoods nor double roofs. They are roofed with corrugated iron.

3rd class, without seats, virtually roofed trucks with open sides. The latest pattern have brown canvas curtains to keep out the sun.

Closed wooden goods waggons, and open steel trucks, each of 10 tons capacity.

There has been little difficulty with axles heating, and so leakage of oil. Cotton pads are used with wicks hanging down into the oil in the grease box, the pad being then supplied by capillary attraction. Oil used is known as ‘Oleanap.’

*Personnel.*

350 all told. All drivers are natives, either Senegalese or from Sierra Leone. They receive from 150 to 200 francs a month, and appear to be fairly satisfactory. The European manager of the workshop inspects each engine before it goes out.
There are European stationmasters at Kotonou, Pahou, and Toffo; all others are natives. Ticket collectors, guards, and pointsmen are all natives. The pointsmen appear to be unsatisfactory, as they are apt to forget, and, if flurried, lose their head.

The permanent-way gang consists of 6 Europeans, 18 Senegalese, and 212 natives, to a total length of 103 kilometres being worked.

Heads of departments are all Europeans; skilled artisans mostly Senegalese.

Telegraphs, Telephones, &c.
All stations are connected by telephone but not by telegraph. The Government telegraph line follows the railway, but on separate posts. An arrangement has now been come to by which the telegraph wires are to be carried on the Railway Company’s steel posts.

At present there is no signalling system. No train leaves a station until ‘line clear’ has been received by telephone from the next. In the case of special trains telephonic instructions are given to clear the line.

For the convenience of traders trucks are sometimes left on the line midway between stations to be loaded with produce, and are pushed on to the nearest station by the first train passing. This would appear to be a very dangerous practice, and will probably end in disaster.

Fuel.
Patent fuel, or briquettes, are exclusively used. They appear to give good speed, but give off a very offensively-smelling smoke. They cost, placed in the yard 75 to 80 francs per ton (£3 to £3 4s.).

Speed.
By regulation speed is limited to 25 kilometres an hour, but as much as 45 kilometres has been attained without accident.

Rates.
Passengers. – 1st class, 50 centimes per kilometre.
2nd class, 25 centimes per kilometre.
3rd class, 7 centimes per kilometre.

Goods. – For produce sent down to the coast:–
Main line:–
Palm oil, 1 franc per ton per kilometre.
Palm kernels, 75 centimes per ton per kilometre.
Whydah branch line:–
Palm oil, 75 centimes per ton per kilometre.
Palm kernels, 60 centimes per ton per kilometre.
A reduction of 10 per cent. made for complete truck loads of 10 tons.
For goods sent up from the coast:—
I franc 50 centimes per ton per kilometre.
1st and 2nd class passengers are allowed 30 kilogrammes of luggage free.
Excess luggage at the rate of 2 francs per ton per kilometre.
The Dahomey Railway bears, at present, every mark of newness and hurry.
The permanent-way was laid at the rate of 1½ kilometres per day, and does not
appear to me to have settled yet. It will, however, have plenty of time to do so
before the Lama embankment is ready for traffic.
To save money, as few Europeans as possible were employed, with the result
that the natives are mostly half-trained and have got into slack and unbusiness-
like methods. Until quite recently there was no check on expenditure, so that the
finances are in a chaotic condition.
C. F. Cromie,
Captain,
His Majesty’s Consul.

Lagos, May 25, 1903.
30975

No. 2.

FOREIGN OFFICE to COLONIAL OFFICE.

(Received August 19, 1903.)

Sir, Foreign Office, August 18, 1903.
I am directed by the Secretary of State for Foreign Affairs to transmit to you,
to be laid before the Secretary of State for the Colonies, the accompanying copy
of a despatch from the British Consul at Dakar transmitting a report on the
Conakry-Niger Railway.

I am, &c.,
F. H. VILLIERS.

Enclosure in No. 2.

Captain C. F. Cromie to the MARQUESS OF LANSDOWNE.
(Separate. Africa.)

My Lord,
Conakry, June 28, 1903.
I have the honour to transmit herewith to Your Lordship a report, with map,

* on the Conakry-Niger Railway.
I have recently spent four days, from Saturday, 20th instant, to Tuesday, 23rd, in inspecting the railway, accompanied by Captain Saleses, the Director. In addition, I have spent several days in closely inspecting the workshops and rolling-stock at Conakry.

On the 20th instant we went by train to the railhead at Tabili, 75 kilometres, and thence by hammock along the line to the Benty River Camp, where the officer in charge gave us accommodation. On the 21st we continued in hammocks, still following the line under construction, which in places was very rough going, as far as the section officer's camp at the 102nd kilometre. In the afternoon we proceeded to the 112th kilometre, from which to the 148th the roadbed is completed and subsequently returned to the camp, where we passed the night.

On the 22nd we started on our return journey, but instead of following the line, took native paths across the mountains, which have been improved for use by transport animals carrying provisions and materials to the advanced camps. At Tabili we again took train as far as Kowria, where we slept, and returned to Conakry in the afternoon of the 23rd.

I was thus enabled, under the very best auspices, to see practically the whole of the line under construction, which struck me as being excellently as well as economically made.

In my opinion two things have principally conduced to produce the good results obtained.

First, the employment, for construction purposes, of officers and men of the Military Corps of Engineers. Their professional attainments are of a very high standard, they are all picked men, and the esprit de corps of their service impels them to give their very best work. At the same time they do not receive the often very exaggerated remuneration which is demanded by civil engineers of any standing, and take a pride in doing their work as economically as possible.

In the bush they live in large huts constructed on the native principle, of native materials, which are excellently adapted for the climate and are also inexpensive to build.

The section officers are usually the first on the ground in the morning, and the last to leave at night; and are always to be found at the most difficult spot, directing and encouraging the workmen.

Some time ago the Governor-General told me how greatly satisfied he was with the excellent work done by the engineers in all parts of French West Africa.

Secondly, the system of small native sub-contractors introduced by Captain Saleses has proved most successful. By its adoption all difficulties with native labour have been avoided. The natives work under the orders of men of their own race, whom they have voluntarily joined on their own terms; while the railway authorities, by giving them rations, ensure their being properly fed, which
they otherwise might not be, as the resources of the country are unequal to providing food for the large number of men employed.

The sub-contractors enter into a signed contract to do a certain piece of work for a certain sum, so that they are sufficiently but not extravagantly paid and at before being accepted, their work has to pass the inspection of the section officer, these are sufficient guarantees that it is up to the proper standard.

That the system is a success is shown by the facts that the rate of contraction since it was adopted has been nearly four times as rapid as before; that there are always more sub-contractors willing to tender for tasks than are required; and that there are upwards of 8,000 voluntary workmen on the line, whereas during the two years that the construction was given to contractors, they had the greatest difficulty in obtaining labour.

As the second section of the line from Kindia to near Timbo will start unhampered by the difficulties which were left by the contractors on the first section, and as there are trained sub-contractors and a sufficiency of labourers only too willing to continue to work on the present terms, there is every reason to believe that the work on the second section will progress even more rapidly than on the first. As the construction will commence with a working railway behind it, the telescopic system of construction will be more fully adopted than has hitherto been possible.

I have, &c,

C. F. Cromte.

Captain.

The Marquess of Lansdowne, K.G.,
&c., &c., &c. /


This line is at present (June, 1903) in course of construction from the port of Conakry, in French Guinea. Its ultimate inland terminus will be Kouroussa, on the River Niger, a distance, according to the present plan, of 680 kilometres (425 miles) which will, however, be reduced to 600 kilometres (375 miles) as the result of new surveys.

History.

Captain Salesses, of the French Corps of Engineers, began, in 1895–96, to make surveys for the construction of a means of communication between Lower and Upper Guinea, and as a result of his studies warmly advocated the construction of a railway.

During the course of the year 1898 the construction of a railway was decided upon, and the principle favoured by the Colonial Ministry in Paris, was to have it built by a concessionaire company, which, in return for constructing and
Construction of Foreign Railways in West Africa

Working the line, should receive large territorial concessions, and an annual sub-
vention.

A proposal to that effect was put forward in January, 1899, the proposed
contract being somewhat similar to that unfortunately adopted in Dahomey,
except that the Company was to do the whole work of construction. This pro-
posal was finally rejected in August, 1899.

It was then proposed that the Colony should raise a loan of 8 million francs
(£320,000), subsequently increased to 12 millions (£480,000), for the construc-
tion of the first section of the railway, which was to be executed by contract.

A decree to this effect was issued on 14th September, 1899, and the contract
was given in February, 1900, to Messrs. Mairesse et Chrismant. They were to
construct 120 kilometres (75 miles) of road-bed with masonry, bridges, and cul-
verts in two years, i.e., by February, 1902.

This firm, not being financially strong enough, associated itself with Messrs.
Devès et Chaumet, of Bordeaux and Senegal, who undertook to furnish the nec-
essary money on the basis of receiving half profits.

In July, 1900, Monsieur Mairesse died, but in November of the same year the
contract was renewed with Mr. Chrismant, who was joined by a brother of the
deceased Monsieur Mairesse. Messrs. Devès et Chaumet continued to finance
the operations, but on much more onerous terms.

It was finally decided by the Ministry that the work of constructing and
working the railway should be done by the Colony itself.

Principle of Construction.
The Colony entrusted the work of construction to the military engineers who
had been employed to superintend the work of the contractors, and in May,
1902, they commenced work under the direction of Captain Salesses, who had
been connected with the enterprise from the very beginning, had made all the
surveys, and was thoroughly acquainted with the country and conditions.

Engineer officers were placed in charge of all departments; the line to be
constructed was divided into sections, to each of which an engineer officer was
appointed to superintend and direct the work of construction. The section offic-
ers were assisted by engineer non-commissioned officers and sappers, as well as
by a certain number of civilians who were taken over from the contractors.

Section officers subdivide their sections into tasks varying in length accord-
ing to the nature of the country and soil, which are undertaken by native sub-contractors, who enter into signed contracts and supply the necessary
labour. Rations of rice for the workmen and all necessary tools are supplied by
the railway administration.

This system has worked extremely well and economically, and has resulted in
the formation and training of a certain number of native sub-contractors, who,
as soon as they have finished one task, tender for another and take their own
gang with them to work on it. In this manner some 8,000 voluntary labourers
are employed.

The line is pegged out, and profiles and sections set up by the engineer officer,
the work is then carried out by the sub-contractor in his own way, but his work is
continually inspected and checked by the sappers, &c., and finally by the officer
in charge, who, when the task is finished, decides whether it has been done
according to contract.

The above system applies purely to the earthwork and ballasting; all masonry
work is done by masons under the direct superintendence of the section officer
and sappers.

When the work was first taken over by the Engineers, Captain Salesses was,
of course, obliged to continue and finish the separated uncompleted sections
begun by the contractors, but that being done he laid his rails on the completed
portion so as to utilize the line for the transport of materials, and especially of
provisions.

Once the roadbed completed, rails were laid at the rate of about 700 metres
a day.

In June, 1903, thirteen months after they took over, the result of the
Engineers’ work is as follows:—

The rails are laid, stations mostly built, and line working for construction
purposes to kilometre 75 (47 miles); line ballasted to kilometre 92, but masonry
not quite completed, and therefore bridges not in position; platform practically
completed to kilometre 148½.

By the end of the year 1903 it is expected that 150 kilometres (94 miles) will
be ready to open for traffic; and next year work will be begun on the second sec-
tion, for which 17 million francs have been put aside out of the recent French
West African loan.

The terminus of the first 150 kilometres will be Kindia, and of the second
section at a point close to Timbo, the capital of the Fouta Djallon.

Cost.

Down to the present the cost of construction by the Engineers has been as
follows:—

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost per kilometre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthwork</td>
<td>19,000 francs</td>
</tr>
<tr>
<td>Masonry</td>
<td>5,000 francs</td>
</tr>
<tr>
<td>Bridges</td>
<td>7,000 francs</td>
</tr>
<tr>
<td>Rails, sleepers, ballast and laying</td>
<td>22,000 francs</td>
</tr>
</tbody>
</table>

Including, in addition to small stations, the terminal station of Conakry,
the construction and equipment of workshops, and houses for the Director and
personnel, the line complete, ready for traffic, has cost 80,000 francs per kilome-
Construction of Foreign Railways in West Africa

tre (£3,200–£5,120 per mile), or if the amount of the indemnity given to the contractors is added. 89,000 francs per kilometre (£3,560 = £5,696 per mile).

Description of Country.
Conakry, the terminus, is a low island whose highest elevation is 12 metres (40 feet) above the sea. As the railway runs down to the wharf it may be said to commence at sea level.

As far as the 8th kilometre the country remains flat and is park-like in character, with large expanses of grass interspersed with groups of trees, including many palms. The soil is laterite rock and gravel, with some sand. From the 8th to the 45th kilometre the general characteristics remain the same, but there is a gradual rise the whole way.

At the 45th kilometre the line definitely enters the mountainous region, passing to the south of the Gibraltar-like mass of Mount Kakoulima. It rises in a series of steps to an elevation of 161 metres (525 feet) at Kowria, whence it descends to 70 metres (230 feet) at kilometre 88. From this point there is a continuous gradual rise to Kindia (kilometre 148), with an elevation of 444 meters (1,460 feet), the terminus of actual construction. / 

The actual highest point of the whole line will be at the Col de Koumi, on the second section, with an elevation of 726 metres (2,389 feet).

The mountains are formed of a hard variety of sandstone, with the exception of 7 kilometres of diabase granite belonging to Mount Kakoulima. They are bold and precipitous and traversed by numerous rivers and streams, the chief of which are the River Koukouré, which enters the sea at Dubiéka, and its affluent, the River Badi. Laterite is found in many places among the mountains.

The country traversed by the first 150 kilometres is not very productive at present, and much of it is practically sterile, except for a covering of bush, with groups of large trees in the river valleys.

Some of the trees furnish excellent wood for carpentering and ornamental purposes, and doubtless some of them will later on be exploited commercially. Under normal conditions, however, this region is thinly populated and labour is, consequently, comparatively scarce. The actual density of population averages seven per square kilometre.

The really productive part of the country is the Fouta Djallon and the slope to the River Niger, so that every effort is being directed to prolonging the line in that direction.

Permanent Way.
A single line of metre gauge, composed of single-headed rails 8 metres in length, weighing 25 kilos to the metre (about 50 lbs. per yard). Steel sleepers laid in the
proportion of 10 per rail of 8 metres. The rails are bolted to the sleepers through two holes by flanged bolts passed through from above, then turned round to catch, and a nut screwed on so as to secure an angle iron which grips the rail.

It is claimed for this system that it is stronger and more secure than the wedge system employed on the British West African railways. The rails are joined by tie plates. The ballast employed is laterite gravel, which is excellently adapted to the purpose, and exists in large quantities. It is laid to a depth of 40 centimetres.

The greatest curve employed has a radius of 120 metres (395 feet), and the steepest slope is 1/40 on the straight, but never so much on the curve.

Points are worked by hand horizontally with a counterweight.

There are several turntables at Konakry, and one at Kowria, which, in addition to being useful for reversing engines, is so placed as to enable goods wagons to be run into the goods shed for loading and discharging. Others will be placed at stations as required.

The line is well drained by means of side ditches discharging the water as occasion offers.

**Bridges, Embankments, &c.**

As might be expected from the mountainous nature of the country traversed, these are very numerous.

Owing to the generally rocky nature of the soil, blasting has had to be freely resorted to for cuttings – gunpowder having been employed in preference to high explosives as being cheaper and better understood by the natives.

The bridges are very numerous, owing to the number of rivers and streams. They are of all sizes, from 2 metres up to 80 metres (6 feet 7 inches to 265 feet), but there are many between 10 and 15 metres (33 to 50 feet). The longest is 80 metres long and 17 metres high (265 feet by 56 feet). / They all consist of one or more masonry piers, built of laterite stone which is found plentifully at hand. All lime has to be imported, as limestone does not exist in the country. The piers are traversed by iron girder bridges imported from France.

The cost of bridges and metal culverts (similar to those in use on the Congo Railway), apart from masonry, averages £280 per kilometre, or £42,000 for the 150 kilometres under construction.

Embankments are plentiful, the highest being about 40 feet. In several cases retaining walls have had to be built to hold them up. In this climate grass now begins to grow on the embankments and cuttings, which binds them together, and seeds are sown so as to expedite the growth.
**Buildings.**

With the exception of Conakry Station, all the present stations are temporary structures of wood with corrugated iron roofs, and are raised on 50 centimetre concrete piers, but they will be gradually replaced by permanent buildings.

Conakry Station consists of a ground floor and upper storey. The ground floor is built of laterite, the upper storey has a steel skeleton supported on steel posts forming a verandah for the ground floor. The upper storey is filled in with bricks and also has a wide verandah all round. It is roofed with Marmiller tiles. The steel-work, tiles, and bricks are imported from France, it having been found economical to use French bricks which resist moisture without covering, rather than the bricks made in Conakry, which, not being so dense, require to be covered with a coating of cement. All the station buildings will be of this character, as are also the head offices and quarters for the Director and staff.

The engine-sheds and iron-shop are of brick with corrugated iron roofs. Most of the existing goods-sheds are entirely of corrugated iron.

At Conakry there is an iron and fitting-shop, and also a carpenter's shop, both well fitted with the latest machinery. The resources of the fitting-shop can be judged from the fact that an engine recently landed was put together, several of the parts made over, as they did not quite fit, and sent on her first run on the eighth day after landing.

All the woodwork required for the various buildings is made in the carpenter's shop, in many cases of native wood, but at present nothing is made in the way of rolling-stock beyond the frames for construction wagons.

Most of the wooden furniture required is also made in this shop.

Later on workshops will be established at Kindia for the second section.

**Rolling-Stock.**

At present there are four large tank engines of 30 tons, loaded, having a water capacity of 3 cubic metres. They have three coupled driving wheels with a bogie. They are not compound.

There are also three small metre-gauge Décauville engines used for construction work. When the first section to Kindia is opened for traffic, these will be sent on to the second section.

First-class carriages are on two bogies, second-class on two pairs of wheels without bogies. There are four first-class carriages provided with lavatory accommodation, and eight second-class without.

There are no special third-class carriages, it being the intention to fit up of the present covered goods wagons with seats for native passengers.

There are 14 covered goods wagons, of about 8 tons carrying capacity, and 38 trucks, all without bogies. In addition, there are 11 long bogie trucks at present used for the carriage of rails and material.
There are 5 trollies and 4 pump cars for the use of the personnel. The construction plant consists of 5 waggons and 21 tip cars, holding from 2 to 3 cubic metres.

**Water.**

There is watering accommodation at every station, which are at distances varying from 15 to 25 kilometres apart.

The source of the water varies according to circumstances. At Simbaia, 17 kilometres from Conakry, a large rain-water tank is under construction, which is calculated to provide sufficient water for the whole year. Other stations have wells, and at others streams have been diverted so as to supply by gravitation. In each case the method of supplying the engines is the same. A hydraulic stand-pipe is erected by the side of the line, and the water arrives under pressure.

**Coal.**

As a rule briquettes (patent fuel) are employed, and are said to give equal steam results per ton as coal, while avoiding the dust and waste of the latter.

The cost at present is about 65 francs (£2 12s.) per ton landed at Conakry, but it is expected that, as the result of negotiations in progress, it will be obtained at about 45 francs (£1 16s.).

**Personnel.**

As the line is still under construction and not opened for traffic, the arrangements are temporary. All heads of departments are Engineer Officers, station-masters are usually sappers, but in one or two instances civilians. Engine-drivers are natives, mostly Senegalese, but natives of the country are being trained. Pointsmen are natives. In the iron-shop the workmen are Senegalese under European supervision; in the carpenter’s shop they are entirely Senegalese, the foreman in charge being of the same race, and the results are quite satisfactory.

The whole of the workshops are under the direction of a Captain of Engineers.

The construction personnel has already been described.

**Telegraphs, &c.**

Both telegraph and telephone are employed, the wires being carried alongside the line on iron T posts.

There are at present no signalling arrangements or staff system, line clear being obtained from the next station by telegraph or telephone.

At each station there is a European and a native telegraphist, the former to instruct the latter. As soon as practicable the Europeans will be got rid of on account of expense.
The principle has been laid down that the construction shall always be done by the Engineers, but once construction completed and the line open for traffic, a civil staff will be employed.

What is known as the regime of the French State Railways will be adopted, so that the Conakry-Niger Railway may be affiliated to them with the advantage of interchange of personnel, so that the Conakry Railway will be officered by volunteers from the State Railways, who will come out for a two-years’ tour, receiving, while in the Colony, double European pay, and at the end of their tour reverting to their original post on the State Railways. It is hoped by this arrangement to obtain a constant supply of trained personnel without burdening the Colony with a heavy pension list.

C.F. Cromie,
Captain,
His Majesty’s Consul.

Conakry, June 28, 1903.

No. 3.

CROWN AGENTS to COLONIAL OFFICE.

(Received May 28, 1904.)


Sir,

I have the honour to transmit, for the information of Mr. Secretary Lyttelton, with reference to the correspondence* noted in the margin, two copies of the report which we have now received from the Consulting Engineers upon the various railways constructed, undertaken, or proposed by foreign Governments in West Africa.

Colonial Office to Crown Agents, No. 12097/04, 19th April, 1904.
2. The original enclosures to your several letters are returned herewith.

I have, &c.,

E. E. Blake

Enclosure in No. 3.

REPORT UPON RAILWAYS CONSTRUCTED BY FOREIGN POWERS IN WEST AFRICA by Messrs. Shelford and Son, Consulting Engineers to the British West African Government Railways, May 14, 1904.[...]

* 10414 and 12097: not printed.
Communications in Africa, 1880–1939: Volume 2

2. This report is compiled from information extracted from voluminous literature, principally newspapers, either forwarded from the Foreign Office, through yourselves, and the Colonial Office, or obtained privately by us.

3. The information thus obtained is frequently contradictory and in many cases unofficial, but by judicious selection we hope we have been able to report herein only the actual facts concerning these railways. This report must, however, on account of the sources from which the information has been derived, be submitted with some reserve.

We were informed by your E./240/5, of the 2nd June, 1903, that the Secretary of State had decided that it was unnecessary to employ Mr. Glasier at present to inspect any of these railways, as had been suggested by us.

**French Colonies: Senegal.**

**St. Louis-Dakar Railway.**

4. The St. Louis to Dakar Railway has a gauge of one metre. It commences at St. Louis, the seat of the Government, and runs in a southerly direction to Dakar, which is one of the two important ports in French West Africa, the other being Konakry. This line is the only portion actually constructed out of an ambitious railway scheme put forward by Admiral Jaureguiberry about 1880.

The total distance between the above-mentioned towns is 264 kilometres (164 miles).

5. For the first 20 miles from St. Louis the country is flat and sandy, after which it becomes woody and undulating.

In the Cayor district the line passes through a large forest of palms until a distance of 92 miles is reached; then, after running through broken country, it traverses marshy ground until within a distance of 20 miles from Dakar, where the ground becomes again dry and sandy.

6. The concession for the making of the St. Louis-Dakar Railway was granted October 30th, 1880.

Under this concession the State guaranteed (1) the interest on the capital required for construction, *i.e.*, 3,400 francs per kilometre or 5 per cent. on the cost estimated at 68,000 francs per kilometre (£4,352 per mile); (2) the difference between the working expenses and the actual receipts.

Under this arrangement the Company could lose nothing, and took care not to charge more than 68,000 francs per kilometre to construction, and took no trouble to keep down working expenses. The terms were, in fact, extravagant.

7. This concession was amended by the Senate and replaced by a modified concession which became law on June 29th, 1882.

Under the amended concession the guarantee of 3,400 francs per kilometre was reduced to 1,154 francs per kilometre, but the State undertook to contribute...
12,680,000 francs towards the cost of construction, about three-quarters of the whole. The working expenses were to be agreed, when the conditions of working were better known, between the State and the Company and fixed at a certain amount.

The terms were still very liberal; the Company still ran no risk, and the shares were eagerly taken up and the railway pushed with feverish haste and completed in three years (1885).

8. The work was carried out so rapidly and so badly that in 1883, only one year after the concession was granted, a Commission of Engineers was appointed to visit the works. Their report showed that the Company intended to live on the guarantee of interest on the cost of construction, leaving the cost of permanent work to be debited to revenue, against loss upon which they were guaranteed by the State. / The working expenses became so high that in 1890 the Home Government intervened and placed the matter on a proper footing.

In 1898, for the first time the receipts exceeded the expenses.

9. The St. Louis-Dakar Railway has cost the State the following:–

<table>
<thead>
<tr>
<th>Fees (francs/£)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Contribution to the capital of construction</td>
<td>12,680,000</td>
</tr>
<tr>
<td>2. Guarantee of interest from 1883 to 1890</td>
<td>9,993,657</td>
</tr>
<tr>
<td>3. Guarantee of interest from 1890 to 1900</td>
<td>11,867,458</td>
</tr>
<tr>
<td>4. Guarantee of interest from 1900 to 1902</td>
<td>850,000</td>
</tr>
<tr>
<td>Total (francs)</td>
<td>35,391,115</td>
</tr>
<tr>
<td>(£1,415,644)</td>
<td></td>
</tr>
</tbody>
</table>

The length is 164 miles.

Cost per mile to the State = £8,630 per mile, to which has to be added the expenditure of the Company itself, the Company having a capital of £200,000 only. This amount is stated to have been 3,165,000 francs or £126,600, equal to £772 per mile.

The actual cost of the railway to date appears therefore to have been:–

<table>
<thead>
<tr>
<th>Per mile.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost to the State</td>
<td>£8,630</td>
</tr>
<tr>
<td>Cost to the Company</td>
<td>772</td>
</tr>
<tr>
<td>Total cost of railway</td>
<td>£9,402</td>
</tr>
</tbody>
</table>

10. The road was constructed by European navvies, who could only work six months during the year, namely, during the dry season, from December to June. It was only possible to rely upon native labour for auxiliary duties. Native

*Colonial Office Note. – These figures are taken from a report by M. Lucien Herbert, printed for the Chambre des Députés in 1903. It must be remembered that a large portion of the sum given represents interest on capital, and loss on working, which are not included in the figures for British Railways (except net loss on working for a few months). A later Parliamentary Report of 1904. (Nos. 1959 and 1960, by M. Bourrat) gives (page 90) the final cost, including rolling stock, at 80,000 francs per kilometre, or, approximately £5,120 per mile.
labourers were to receive a daily wage paid to them personally; this sum was arranged between the Company and the heads of the various villages.

For 120 miles from St. Louis there are no quarries and all material for bridging had to be imported. Trouble was experienced with the foundations of St. Louis Station.

11. Originally creosoted pine sleepers 5 feet 3 inches long by 6 inches wide were used, but these are not being replaced by steel sleepers 5 feet 9 inches long and weighing 78 lbs. each. The weight of the rails is 20 kilogrammes (44 lbs.) per metre.

12. The only important work on the line is the Leyhar Bridge, four miles from St. Louis. This is an iron bridge of four spans, the two outside spans measuring 30 yards each, and the two inner ones 36 yards each, the total length of the bridge being 132 yards.

13. The rolling-stock consists of the following:

- Fourteen large locomotives (weighing 22 tons, exclusive of tender) having separate tenders, with a capacity of 1,760 gallons of water and 1 ton of fuel.
- Fifteen small locomotives with tenders attached (21 tons) with a capacity of 660 gallons of water and 1 ton of fuel.

14. Both types of locomotive have three coupled axles with the weight equally distributed over the six wheels. These wheels are on the larger locomotives 3 feet 9 inches in diameter with a wheel base of 8.85 feet and on the smaller locomotives 3 feet 6 inches diameter with a wheel base of 7.75 feet.

15. There are also 60 carriages, first and second class, some being corridor cars; and 24 third class carriages, 310 wagons, covered and open trucks. These trucks range in weight from three to four tons and carry eight tons; both carriages and trucks have two axles each, iron frames and wooden bodies.

16. The Dakar-Rufisk section, 19 miles in length, was opened for traffic in July, 1883; work had been commenced simultaneously at St. Louis, but did not progress so rapidly.

- Three more sections were opened in 1884.
- The finished line was opened and inaugurated on July 6th, 1885, having taken about three years to construct. The total length of the line is 164 miles; rate of progress, therefore, was 55 miles per annum.

17. Various difficulties had to be overcome, such as there being no quarries within 125 miles of St. Louis, the difficulty with the foundations of St. Louis Station, and the time wasted owing to the fact that European navvies could only work during the healthy season (December to June).

Epidemics of yellow fever occurred frequently.†

† Colonial Office Note. – It is mentioned in one report that a great many culverts were required over marshy ground between the 15th and 47th mile from Dakar.

* Colonial Office Note. – One source of information gives five tons.
The Kayes-Niger Railway.

19. The Kayes-Niger Railway has a gauge of one metre; its total length is 563 kilometres (349 miles). It starts from Kayes in a south-easterly direction, passes through Bafoulabe, Kita, and Bammakoo, and terminates at Koulikoro on the River Niger. From Koulikoro the Niger is navigable as far as to *Timbuctoo.

20. For a distance of 170 miles the railway passes through a wooded and broken country, following the course the Senegal River. Then it passes through a cutting 23 feet deep and 900 yards long through hard rock and finally emerges into a tract of country which is open and level as far as Kita. 301 miles (485 kilometres) distant.

The country around Kita becomes again broken, and from thence to the valley of the Niger the descent is fairly steep.

Up to Bafoulabe (82 miles) the gauge was one metre. From Bafoulabe, funds being attenuated, the metre gauge materials were used to prolong the line for 41 kilometres upon 50 centimetre gauge (1 foot 7 11/16 inches). Bridges were abandoned and traffic was hauled over rivers by mules. The timber sleepers rapidly decayed, and this portion of the railway was replaced in 1889 by a line of 60 centimetre gauge (about 2 feet) equally defective.

21. The railway was authorised on February 26th, 1880, and rough preliminary surveys were made 1880–1881. Stores were sent out in 1881, operations commencing in April, 1882.

At the time the first credits were voted the French were not masters of the Colony, as it was not subdued before the middle of 1882.

Great mistakes were made at first by not shipping materials early enough in the season for forwarding by river to Kayes; this alone caused considerable loss and delay. Other difficulties arose such as epidemics of yellow fever, difficulty in getting sufficient credits voted by the Chamber, and lastly, changes in the personnel. The work has been energetically pushed forward since 1898 only, owing to the fact that the direction of the construction of the line had changed hands frequently.

Proper surveys were not undertaken until 1891, although the work had been proceeding for 10 years. /  

22. From 1881 to 1888 construction was entrusted to civil engineers, from that date until 1892 it was in the hands of the Marine Artillery, from 1892 to 1896 a was under the direction of military engineers, and, finally, from 1898 it has been in the hands of the French Government, assisted by the Colony of Senegal and the Soudan.

* Colonial Office Note. – Captain Cromis states that from Koulikoro the Niger is navigable without interruption, not only as far as Timbuctoo (594 miles but beyond to Ansongo (377 miles lower again).
23. Native labour, as far as possible, is employed, and is under the supervision of European non-commissioned officers and privates of engineers. The labourers are paid 60 francs a day and rations. The native labourers are hired of their own free will, paid monthly, lodged in straw huts and rationed by the Government.

24. There are three important works on the railway, viz., the Galonge, Mahina, and Tukoto bridges.

The Galongo bridge is an iron girder of four spans, having a total length of 82 yards and a height of 60 feet.

The Mahina bridge which traverses the River Bafing is an iron one, having a total length of 480 yards. It is divided into 16 spans, 30 yards each in length, resting on brick piers.

The Tukoto bridge which spans the Bakoy River is a brick and iron structure 380 yards in length.

25. Since 1898, steel sleepers, weighing about 78 lbs., have been used, these have taken the place of the wooden ones formerly used which were destroyed by ants in about three years. The rails are 20 kilogrammes (44 lbs.) per metre.

26. Up to 1895, eight locomotives had arrived and a number of engines, not definitely known, have been sent out since that year.

The description of the locomotives is as follows:

Four locomotives (10 tons empty) having six coupled wheels (2 feet 3 inches diameter) capable of drawing a weight of 20 tons up an incline of one in forty.

One locomotive (20 tons) with six coupled wheels capable of drawing a weight of 40 tons.

One locomotive of the 'Kayes type' (15½ tons) empty and 20 tons located, having six coupled wheels (2 feet 6 inches diameter) cylinder (10 inches diameter) boiler to contain 242 gallons, tank 550 gallons, coal bunker, 17½ cwt., to burn either wood or coal, and capable of drawing a weight of 45 tons at the rate of 15 miles an hour.

All the locomotives supplies since 1896 are of the 'Kayes' type.

27. The coaches, which are first and second class composites, have been frames 30 feet long, and are mounted on bogies with steel axles and wrought iron wheels.

The bodies of the carriages are 8.85 feet wide and 8.5 feet high with a corridor at one side.

The third and fourth class carriages are also combined and have a length of 25 feet, and are mounted on two axles 12½ feet apart.

28. Progress, was very slow until after the ratification of the convention between the State and the Colony of Senegal upon April 13th, 1898. The first rail was laid in the early part of 1882.
In the year 1883, 10 ½ miles only were laid, and in 1888, railhead had only reached Baoulabe, at a distance of 80 miles.

At the end of 1896, eight years later, a distance of only 35 miles from Kayes had been reached, and not until March, 1899, did railhead reach Walis, a distance of 110 miles. The line was completed as far as Kita by the end of 1901, a distance of 193 miles (310 kilometres).

In December, 1902, the rail extended to the 200th mile, and in 1903, railhead was expected to reach 500 kilometres (312 miles); the whole line, a distance of 349 miles, is expected to be completed by April, 1905.*

The slow progress at first was chiefly due to the manner in which the funds were doled out.

In May, 1903, the mileage open for traffic was about 220 miles.

29. The total cost of this railway to the State to the end of 1903 is as follows:

<table>
<thead>
<tr>
<th>Period</th>
<th>Cost (Francs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st period. Construction by the State, 1880–1884</td>
<td>25,287,536</td>
</tr>
<tr>
<td>2nd period. Abandonment of works, 1885–1890</td>
<td>1,243,532</td>
</tr>
<tr>
<td>3rd period. Surveys, chiefly, 1891–1898</td>
<td>3,962,545</td>
</tr>
<tr>
<td>4th period. Construction by the State and Colony, 1899–1903</td>
<td>36,915,111</td>
</tr>
<tr>
<td>Loans and advances, 1899–1901</td>
<td>16,369,904</td>
</tr>
<tr>
<td>Total length, 350 miles</td>
<td>83,778,628</td>
</tr>
<tr>
<td>Cost per mile, †£9,574.</td>
<td></td>
</tr>
</tbody>
</table>

The line is at the date of this report still unfinished, and the actual cost may be greater than the above.

30. Among special engineering difficulties the following may be mentioned:– The cutting at Manambugu, 23 feet deep and 900 yards in length, through hard rock; the broken country near Kita with the steep descent into the valley of the Niger, and the building of the three bridges, Galongo, Mahina, and Tukoto.‡

* Colonial Office Note. – The first train ran into Bammakoo (500 kilometres), on 19th May, 1904. (202 miles in five years, since March, 1899); and into Koulicoro on 10th December, 1904 (239 miles in 5 3/4 years).

† Colonial Office Note. – How much of this sum is interest on capital, and how much is excess of working expenses over revenue? An article in the Dépêche Coloniale of 25th May, 1904, gives the cost of construction at 75,000 fr. a kilometre, or about £4,800 a mile: and since 1898 Captain Cromie puts the cost at £4,224 a mile.

‡ Colonial Office Note. – Yellow fever epidemics in 1900 and 1901, and want of water in the Senegal in 1902 caused great delay.
31. In order to avoid the difficulties and delays of the present method, namely, by the Senegal River, of reaching Kayes from the coast, it has for some time been contemplated to construct a railway from Thières, a station on the St. Louis-Dakar line, to Kayes. Commandant Belle of the Engineers was accordingly ordered by the Colonial Minister to make a survey for the projected line. That officer has just submitted his report and the trace of the line as proposed by him is shown on attached tracing.*

It is estimated that the line will take five years to complete, but the first 147 kilometres (90 miles) through the rich Baol country could be finished in two years.

32. This is a single line of railway of one metre gauge; it runs from Konakry, on the coast of French Guinea, in an easterly direction, via Kindia and Timbo to Kardamania. 19 miles below Kouroussa in Mandingo. Kardamania is situated on the River Niger, which is navigable from Kardamania as far as Bammakoo, and thence / to Timbuctu. The total length of the railway to Kardamania is 550 kilometres (342 miles).

<table>
<thead>
<tr>
<th>Kilom.</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section I. Konakry-Kindia</td>
<td>149</td>
</tr>
<tr>
<td>Section II. Kindia-Timbo</td>
<td>220</td>
</tr>
<tr>
<td>Section III. Timbo-Couroussa</td>
<td>181</td>
</tr>
<tr>
<td>Total</td>
<td>550</td>
</tr>
</tbody>
</table>

33. The country as far as the 45th kilometre is flat and open, but groups of trees occur in places; after that distance a mountainous region commences which reaches a height of †444 metres (1,460 feet). Numerous rivers and streams intersect the course of the railway, and the valleys are well wooded.

The decree authorising the construction of this railway was issued September 14th, 1899, the constructors arriving in June, 1900.

34. The works were undertaken by a firm of contractors in 1900 (the earthwork and ballasting being done by small native sub-contractors), but in May, 1902, the contractors were at their own request relieved from their contract and the work was taken over by the Government of French Guinea, since which the line has been constructed departmentally.‡

* Not reproduced.
† Colonial Office Note. – This is the height at Kindia, but the highest point on the railway will be at the Col de Koumi, 726 metres – 2,389 feet.
‡ Colonial Office Note. – Under officers of the military engineers.
La Dépêche Coloniale, of 27th March, 1904, gives a comparison of the work done under contract and departmentally as follows:–

<table>
<thead>
<tr>
<th></th>
<th>By Contract</th>
<th>By Department</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>May, 1900 – April, 1902.</td>
<td>April, 1902 – February, 1904.</td>
</tr>
<tr>
<td>Earthworks</td>
<td>45 kilom.</td>
<td>75 kilom.</td>
</tr>
<tr>
<td>Bridges</td>
<td>Insignificant</td>
<td>120 kilom.</td>
</tr>
</tbody>
</table>

35. The rails weigh 50 lbs. per yard (25 kilos. per metre) have a length of 8 metres and were laid upon steel sleepers, 10 sleepers being used for each rail.

Some heavy gradients were encountered which in some places were as much as 1 in 40; these, however, did away with the necessity for tunnelling.

The dimensions of the longest bridge are as follows:– Length, 80 metres; height, 17 metres (265 feet and 56 feet, respectively).

36. The rolling-stock consists of the following:– Four tank engines (30 tons loaded); three small locomotives for construction works; four 1st class and eight 2nd class carriages and 14 covered goods wagons (8 tons); 38 trucks and 11 long logic trucks.

The four tank engines have three coupled driving wheels with front bogies, and their tanks have a capacity of 3 cubic metres.

The first class carriages have two bogies and the second class two pairs of wheels.

37. By June, 1903, rails were laid, stations mostly built, and the line was in working order for constructional purposes as far as Tabili at 75 kilometres (46.5 miles).

In May the same year the line was ballasted for 92 kilometres (57 miles), but the bridges were not completed, though for 150 kilometres (93.5 miles) the earthworks were practically completed.

Sir Edward Monson states from Paris under date March 27, 1904, that traffic now reaches 125 kilometres (78 miles). / The Governor-General M. Roume recently travelled to 102 kilometres (64 miles).

It is expected that the line will be opened to Kindia, 149 kilometres (93 miles), at end of April, 1904.

38. There have been, however, difficulties and delays, such as the breakdown of the contractors’ system, on account of which the work had to be done by the Colony itself under the direction of military engineers. Cement and lime had to be imported, but laterite for masonry was found in abundance.

There was a large quantity of rock blasting in cuttings (the rock here is a species of hard sandstone); numerous bridges had to be built, and many embankments, of which the highest was 40 feet.

39. The estimate for the cost of the whole work was placed at 44 million francs (£1,740,000) or £5,073 per mile.
The cost of the first section of 93 miles was reported to have come within the estimate of 12,000,000 francs (£480,000) or £5,161 per mile, but other reports give up to June, 1903, as much as £5,695 per mile (89,000 francs per kilometre) an additional expenditure of £622 per mile.

*La Dépêche Coloniale* gives the cost of the first section as 95,000 francs per kilometre – £6,100 per mile.

40. The cost of surveying, clearing, stations, telegraph, rolling-stock, administration, and engineering have not been ascertained, but the earthworks come out at 19,000 francs per kilometre, the bridges and masonry at 12,000 francs per kilometre, and ballast at 22,000 francs per kilometre.

41. An extension of this line to Bammakoo has been proposed in order to join the 'Kayes-Niger Railway.'

*The Dahomey Railway*

42. The Dahomey Railway has a gauge of one metre. It commences at Kotonu and runs for a short distance in a westerly direction, there changing into a northerly direction via Allada and Abomey.

There is a branch line 8 miles in length to Wydah.

43. The first section is a distance of 191 kilometres (118 miles) and runs from Kotonu to Paouignan, including the branch line to Wydah of 14 kilometres (8 miles).

This section commences in a marshy district near the coast, and is intersected with lagoons. For about 70 miles it rises with an even slope and is thickly covered with oil palm forests. After 70 miles the country becomes broken.

44. The second section, which is from Paouignan to Tchaourou, is 209 kilometres (130 miles) in length and is hilly and intersected with ravines.

The total distance of these two sections, *i.e.*, Kotonu to Tchaourou, is 248 miles, made up thus:

<table>
<thead>
<tr>
<th>Route, Length, &amp;c.</th>
<th>Kilom.</th>
<th>Miles.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section I. Kotonu to Paouignan</td>
<td>191</td>
<td>118</td>
</tr>
<tr>
<td>Section II. Paouignan to Tchaourou</td>
<td>209</td>
<td>130</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>400</strong></td>
<td><strong>248</strong></td>
</tr>
</tbody>
</table>

45. The decree for the authorization of the Dahomey Railway was given by the President of the French Republic on the 26th of June, 1900.

This gave a concession to M. Borelli who, on June 7th, 1901, a year later, transferred it to the 'Compagnie Française des Chemins de Fer au Dahomey.'

The survey of the line had been previously undertaken by the French military engineers and was commenced in March, 1899. /

46. The following are the terms of the concession:–

(1) The Colony grants to the Company 295,000 hectares = 730,000 acres.
(2) The Colony binds itself to construct the ‘infra-structure’ and to hand it over to the Company in annual sections of 50 kilometres (31 miles).

(3) The Colony binds itself to pay to the Company a subvention of 2,000 francs per kilometre of railway worked (£128 per mile) for 8 years (i.e., a total sum of £1,024 per mile).

(4) The Company makes the superstructure (bridges, permanent way, rolling stock, and stations).

(5) The Company shares its profits with the Colony after the nett receipts exceed 6,000 francs per kilometre (£384 per mile).

(6) The concession is for 75 years, after which the Colony will become proprietors of the railway.

N.B. – The land grant referred to in (1) has brought forth vigorous protests from the natives from whom the land has to be taken. It will probably be revoked, but the Company will demand compensation.

The concessionary Company also has the option for 25 years to construct the extension of the line from Tchaourou to the Niger.*

47. Earthworks were commenced May, 1900, evidently prior to the actual date of the concession. The construction of the road bed, including culverts, bridges, cuttings, and embankments is carried out by the military engineers at the Colony’s expense; when this work is complete it is handed over to the Company, which has to lay the permanent way, build the stations, &c., and work the line.

48. The earthwork is carried out by the natives, who are hired through their chiefs, and is carried out on a system of piece work, the rate of pay being about one franc per cubic metre of earthwork.

For the first 30 miles there was practically no proper ballast; over this part a composition of gravelly sand has been used.

There are no tunnels or large bridges, the longest bridge being over the River Zoo; this has a length of 95 metres.

Single-headed steel rails, weighing 20 kilogrammes (44 lbs.) per metre, are task on steel sleepers placed 1,333 to a kilometre.

49. The rolling-stock will consist of three tank engines (30 tons) and four tank engines (15 tons).

* Colonial Office Note. – A new Convention was concluded with the Company in August, 1904. The territorial and mining concessions are renounced by the Company; the superstructure up to Tchaourou will be built by the Company at the expense of the Colony, according to a fixed scale of prices; the Company will work the railway up to this point for 25 years, but under an arrangement with the Government as regards profit and loss on working; the preference previously according to the Company for the construction of the superstructure of the line from Tchaourou to the Niger is revoked.
Under the terms of the concession all rolling-stock is to be on the bogie principle, and the locomotives are to be of the best type, all tenders and engines to be fitted with brakes on all wheels. All passenger carriages are to be fitted with springs and are to be of three classes, affording suitable protection against sun and rain. First class carriages are also to be similar to those used in the Congo Free State and on the Senegal Railway, whilst the third class carriages are to be railway trucks specially fitted up. Covered goods wagons and open steel trucks are to be of 10 tons capacity each. According to the contract one train a day is to run each way, two trains a week each way are to be for the carriage of mails and passengers exclusively, and are to have a speed of 25 miles an hour, excluding stoppages.

50. The following are the principal dimensions of the proposed rolling-stock:—

- The width of the locomotives is not to be more than 2.50 metres (8 feet 2 inches) and of the rolling-stock, including footboards and other projections, not more than 2.80 metres (9 feet 3 inches), and the extreme height of a load not more than 3.75 metres (12 feet 3 inches) above rail level.

Progress.

51. The progress has been as follows:— 8 miles completed to Wydah, June, 1902, and completed to Attogan on the 4th September in the same year. To the end of 1903, 55 miles were completed, and difficulty was experienced in crossing the Lama swamp. The whole of the first section to Paouignan, 118 miles in length, is expected to be finished in 1904, but this is not likely to be realised, and the Company have promised to finish the second section, which is a distance of 130 miles, from Paouignan to Tchaourou by 1908.

Cost.

52. The total cost of the Dahomey Railway is difficult to ascertain. It is given by M. de Bunsen in a memorandum accompanying Sir E. Monson’s, No. 56, Africa, of 23rd June, 1903, as follows:—

Kotonu to Paouignan is estimated (distance 118 miles, and Wydah branch 8 miles = 126 miles).

<table>
<thead>
<tr>
<th>Cost per mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of substructure paid by Colony</td>
</tr>
<tr>
<td>Cost of superstructure paid by Company</td>
</tr>
<tr>
<td>£937,146  £7,437</td>
</tr>
</tbody>
</table>

The accuracy of these figures is doubtful. From other sources we obtain:—

- Cost of substructure paid by Colony | £4,160 |
- Cost of superstructure paid by Company | £2,567 |
- £6,727

In either case the total cost appears to be about £7,000 per mile, but the proportions paid by the Colony and by the Company, respectively, are uncertain.

The Company receives a subsidy of £1,024 per mile, spread over 8 years, and the enormous land grant above referred to. The railway, when completed, will be
owned by the Company and not by the Colony. There is no loan to the Colony, and £40,000 is paid annually for construction out of the revenue of the Colony.

The railway belongs to the Company for 75 years, although a certain proportion of the cost appears to have been paid by the Colony and an enormous land grant has been given to the Company or compensation in lieu thereof. The cost of the railway to the Colony appears from the latter figures to be:

\[
\text{Per mile.} \\
\text{Expenditure by the Colony on infrastructure} & \quad £4,160 \\
\text{Subsidy payable to Company} & \quad £1,024 \\
\hline
= £5,184 \\
to which is to be added the land grant.
\]

The railway belongs to the Company and not to the Colony.

53. Considerable delay was caused in 1901 by the concessionary Company requiring more favourable terms; this was met by their being granted the large concession of land.

The difficulties of construction over the Lama swamp near Toffo (88–103 kilometres) have caused considerable delay. All the early attempts to build an embankment over this marsh failed, but according to the ‘Dépeche Coloniale,’ of January 31st, 1904, all difficulties have now been overcome owing to the ingenuity of the French engineer officers; and the earthworks, which are now complete as far as Paouignan (193 kilometres from Kotonu) will shortly be handed over to the Railway Company.

A detailed survey of the country between Paouignan and Tchaourou has been made and the trace of the line between these places definitively settled.

54. An extension is proposed from Tchaourou to Karimana near Say on the River Niger, making a total distance of 435 miles.

Ivory Coast Railway.

55. This railway, having presumably a gauge of one metre, has been recently authorised and is to commence at Abidjean on the mainland on the north side of the Grand Bassam lagoon, and about 8 kilometres from the sea at Petit Bassam. It then having touched Ery Macougié will take either of two routes, viz:– an eastern route passing through Tranou, Gramabasso, Azarekrou, and Djinois, or a western route through Ananguié Gonabo, Odiao, and Betimbo; both of these routes are under consideration and both terminate at Kouadiokofi.

56. The total length of the line from Abidjean to Kouadiokofi is 265 kilometres (165 miles) and the length from Abidjean to Ery Macougié is 49 miles.

57. The first section of this line passes through somewhat difficult country, which will necessitate a tortuous route. As far as Tranou the country is very similar to the first section, but to the north of Tranou it becomes much easier, and open plateaux are crossed.
58. Mr. Mackie, the British Consul at Dakar, reported, January 25th, 1904, that the authorization of the railway had taken place, but the War Office Intelligence Department reported that authority had been received on November 16th, 1903.

The line was surveyed in 1899 by Commandant Houdaille who is also to take charge of the work.

59. It is interesting to note that ‘To escape certain inconveniences met with in Dahomey, the Colony is constructing this line departmentally, both superstructure and infrastructure. The superstructure will follow close upon the earthworks. The railway will be used to carry the material forward.’

60. The difficulties of the line are stated to be intermediary between those encountered upon the Dahomey Railway and those upon the Guinea Railway.

The minimum curve has a radius of 100 metres and the maximum gradient will be 15 per 1,000 or 1 in 70. The highest bank will be 5 metres and the deepest cutting 2½ metres.

61. There are no great works such as there are on the Dahomey Railway. The largest bridge over the Bete has a span of 10 or 12 metres only, the bridge over the N’Zi a span of 80 to 100 metres, and the River Agneby a span of 40 metres.

62. The cost for the 49 miles from Abidjan to Ery Macougié is estimated at £247,000 (£5,050 per mile); to this a sum of £28,000 must be added, the estimated cost for cutting a canal through to the sea.

The canal is to be cut from the ocean to the Grand Bassam lagoon, 7 metres deep, admitting ships of 6 metres draft.

The cost beyond Tranou may be somewhat less, namely, 75,000 francs per kilometre (£4,800 per mile).

The sum of £400,000 has been allotted to the Colony for railway construction from the Imperial loan of 65,000,000 francs.

63. Operations may be taken to have commenced about February, 1904.

### Congo Free State Railways

#### Matadi-Leopoldville Railway

64. The Matadi to Leopoldville Railway commences at Matadi and has a gauge of 0.75 metres (29½ inches); it terminates at Leopoldville, having a total length of 400 kilometres (250 miles).

The line traverses a rough country which presents some difficulties and requires the construction of numerous bridges and extensive earthworks.

65. The construction of the railway was commenced at the beginning of 1891 and was completed as far as Stanley Pool in 1898. The staff employed in the construction of the line included from 200 to 250 Europeans.
66. The rails weighing 21.5 kilogrammes (47 lbs.) were laid on steel sleepers having a length of 1½ metres and weighing 71½ lbs. each. The steepest gradient encountered is 1 in 25, and the sharpest curve has a radius of 60 metres.

67. The locomotives have been specially designed for this railway and the wagons are mostly of 10 tons capacity.

68. The survey was commenced in 1887 and was completed in 1898.

69. The cost of the whole work is stated to have been 65 million francs, which is equal to £10,400 per mile.

Railways in Mayumbe.

70. The line from Boma is a single line of .60 metre (about 2 feet) gauge.

71. It was commenced in October, 1898, and by December, 1901, had progressed as far as the Lukula River, a distance of 80 kilometres (50 miles).

72. The rails weighing 18 kilogrammes (40 lbs.) per metre are laid on steel sleepers 1.25 metres in length and weighing 18.341 kilogrammes (about 40½ lbs.).

73. The locomotives weigh from 10 to 12 tons, and the goods wagons are designed to carry a load of 5 tons each.

    The speed of the trains is about 20 kilometres (12 1/2 miles) an hour.
    All bridges are made of wood.

Details of French Imperial Loan to West Africa.

74. From the report presented to the ‘Chambre des Députés,’ No. 848, dated 28th March, 1903, by M. Lucien Hubert on behalf of the Commission of Foreign Affairs appointed to examine the Bill authorising the Government-General of French West Africa to raise a loan of francs 65,000,000 for works of public utility and general interest, we learn that funds for the prosecution of the French West African Railways now in hand will be largely derived from this loan, of which the details are as follows:–

    Amount, 65,000,000 francs.
    Rate of interest, 3½ per cent.
    Redeemable, 50 years.
    Francs.

1. Sanitary works 5,450,000
2. Harbours 12,600,000
3. Railways:–
   (a) Survey of railway joining Kayes to Dakar-St. Louis Railway and improvement of Rivers Niger and Senegal 5,500,000
   (b) Konakry-Niger Railway 17,000,000
   (c) Port and railway on Ivory Coast 10,000,000
4. Repayment of remainder of loans of 8,000,000 and 4,000,000 contracted by Colony of French Guinea in 1899 and 1901 for the railway 11,648,053

5. Repayment of remainder of loan of 5,000,000 contracted by Senegal in 1892 2,654,662

Sundries 147,285
Total Francs 65,000,000

The loan is guaranteed by the French Government. All materials are to be of French origin and imported under the French flag.

**Rates of Progress.**

75. The rate of progress of the French and other West African Railways is shown in Diagram I, while for the sake of comparison the rate of progress of the British West African Railways is also given in Diagram II.

The progress is naturally somewhat irregular in each case owing to interruptions and unforeseen contingencies and is best studied in detail upon the diagrams. In Diagram I, the progress is shown as given in various reports and is not in close detail, but in Diagram II, the actual position of railhead month by month is shown. /

To make a general comparison the following table* is of interest.

<table>
<thead>
<tr>
<th>Railway</th>
<th>Commencement of operations</th>
<th>Completion or latest information</th>
<th>Time elapsed</th>
<th>Distance</th>
<th>Average length constructed per annum.</th>
</tr>
</thead>
<tbody>
<tr>
<td>French –</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kayes-Niger</td>
<td>1881</td>
<td>May 1903 (unfinished)</td>
<td>22</td>
<td>220</td>
<td>10</td>
</tr>
<tr>
<td>Konakry-Niger</td>
<td>1900</td>
<td>1904</td>
<td>4</td>
<td>78</td>
<td>20</td>
</tr>
<tr>
<td>Dahomey Railway</td>
<td>1899</td>
<td>1903</td>
<td>4</td>
<td>55</td>
<td>11</td>
</tr>
<tr>
<td>Belgian –</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Congo Railway</td>
<td>1889</td>
<td>1898</td>
<td>9</td>
<td>250</td>
<td>28</td>
</tr>
<tr>
<td>British –</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sierra Leone Railway</td>
<td>1896</td>
<td>1903</td>
<td>7</td>
<td>175</td>
<td>25</td>
</tr>
<tr>
<td>Gold Coast Railway</td>
<td>1898</td>
<td>1903</td>
<td>5</td>
<td>170</td>
<td>34</td>
</tr>
<tr>
<td>Lagos Railway</td>
<td>1896</td>
<td>1900</td>
<td>4</td>
<td>125</td>
<td>31</td>
</tr>
</tbody>
</table>

It will be seen that the above table takes no account of delays or interruptions, merely stating time elapsed from the commencement of operations to the present time, or to the date of the latest information, together with the distance covered in miles.

* **Colonial Office Note** – The St. Louis-Dakar line is not included in the Table (164 miles in less than three years). The Kayes-Niger line suffered long interruptions; since 1898, when the work was actively taken up, over 40 miles a year have been constructed.
Cost of Construction.

76. The cost of construction of the French and Belgian Railways in West Africa, as far as we have been able to ascertain, is shown in the following *table in comparison with the British Railways:–

## Cost per Mile.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Louis-Dakar</td>
<td>1.00</td>
<td>164</td>
<td>£8,630</td>
<td>£772</td>
<td>£9,402 Company.</td>
</tr>
<tr>
<td>Kayes-Niger</td>
<td>1.00 and 0.60</td>
<td>349 (proposed).</td>
<td>9,574</td>
<td>–</td>
<td>9,574 Colony.</td>
</tr>
<tr>
<td>Konakry-Niger</td>
<td>1.00</td>
<td>342 (proposed).</td>
<td>6,100</td>
<td>–</td>
<td>6,100 Colony.</td>
</tr>
<tr>
<td>Dahomey</td>
<td>1.00</td>
<td>248 (proposed).</td>
<td>4,160</td>
<td>2,567</td>
<td>6,727 Company.</td>
</tr>
<tr>
<td>Ivory Coast</td>
<td>1.00</td>
<td>165 (proposed).</td>
<td>Just authorised.</td>
<td>5,050 Colony.</td>
<td></td>
</tr>
<tr>
<td>Congo Free State</td>
<td>0.75</td>
<td>250</td>
<td>–</td>
<td>10,400</td>
<td>10,400 Company.</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>–</td>
<td>–</td>
<td>4,300</td>
<td>–</td>
<td>4,300 Colony.</td>
</tr>
<tr>
<td>Gold Coast</td>
<td>–</td>
<td>–</td>
<td>10,300</td>
<td>–</td>
<td>10,300 Colony.</td>
</tr>
<tr>
<td>Lagos</td>
<td>–</td>
<td>–</td>
<td>7,064</td>
<td>–</td>
<td>7,064 Colony.</td>
</tr>
</tbody>
</table>

* Colonial Office Note. – This table cannot be regarded as affording a fair comparison of the cost of construction of the British and Foreign railways. It is pointed out in previous notes that the figures given for the French lines represent, to a very large extent, interest on capital and deficits in working. The Sierra Leone railway is of only 2 ft. 6 in. gauge. As regards the Lagos railway, the total capital expenditure, including all buildings and equipment, is estimated on completion to reach about £1,085,000, or £8,680 a mile; but it is not clear whether such complete expenditure is included in the lower figures given for the French railways. /
Conclusion.

77. To summarize this report it may be stated that the St. Louis-Dakar Railway has been long completed; the Kayes-Niger Railway is now being pushed forward with activity and will shortly be completed to the Niger, while it is proposed to overcome the difficulty of navigating the Senegal River by connecting Kayes with the St. Louis-Dakar Railway. In French Guinea the Konakry Railway has been completed for 93 miles and is being rapidly pushed forward towards Couroussa on the Niger. The Ivory Coast Railway is now being started. The Dahomey Railway is finished for 55 miles and is being energetically pushed forward to Tchaourou, while it is obviously the intention of the French to extend it as soon as possible to Say on the Niger River.

78. In the aggregate the French Railways actually completed already exceed in length the British constructed lines, while the work now in hand entirely dwarfs the British West African Railways which have come to a temporary standstill. The railway schemes in French West Africa are naturally of a more ambitious nature than in the British Colonies on account of the greater area of territory belonging to France.

79. The British and French railways, constructed and in course of construction, are clearly shown on the map* accompanying this report.

80. With regard to the speed of construction it is clear that so far the French have not reached the rate of progress of the British railways† in spite of the reports to the contrary. The public often appear to be misled by the length of work in hand and to confuse this with the length of railway actually completed. For instance, in the case of the Dahomey Railway, where the earthworks are constructed by the Colony far in advance of the construction of the bridges, permanent way, stations, &c., the whole length up to the clearing and earthwork gangs is often spoken of as if actually carrying traffic.

81. With regard to cost of construction it will be seen that the British railways compare‡ favourably with the French, although it is true that the Gold Coast Railway has cost rather more than any other. Upon this, however, very special difficulties were encountered, and on the other hand the Sierra Leone Railway has cost less than any other railway upon the Coast. Here again the public is often misled, particularly in the case of the Dahomey Railway, where the substructure of the railway is being constructed at the cost of the Colony for some £4,200 a mile. The fact that the Railway Company is left to supply all that

* Not reproduced.
† Colonial Office Note. – See previous note on page 24.
‡ Colonial Office Note. – See previous note on page 24. On a fair view it would seem probable that the construction of the British railways has been distinctly more expensive than that of the French.
appertains to a railway at its own expense is ignored, as well as the fact that the Colony pays to the Company a subsidy, gives an enormous land grant, or compensation in lieu thereof, and does not own the railway until 75 years hence. The Company and not the Colony owns the railway and controls the rates.

82. As regards methods of securing the construction of railways, the French Government have had a bitter experience of granting a railway concession in the case of the St. Louis-Dakar Railway. They have also upon Government lines had unfortunate experiences of contractors as, for instance, upon the Konakry-Niger Railway where the contract system collapsed and was replaced by the ‘departmental system.’ The peculiar method adopted in Dahomey whereby the Colony constructs the substructure of the railway itself and leaves the Company to supply the superstructure appears to have been unsatisfactory, many questions having arisen between the concessionaire and the Government.

83. It may be assumed that the experience of the French Government in constructing railways in West Africa is embodied in the decision to construct the new Ivory Coast Railway upon the ‘departmental system’ which appears to be practically the same as that adopted by the British Colonies.

We have, &c.,

SHELFORD AND SON.

To the Crown Agents for the Colonies, Whitehall Gardens, S.W.

[...]

28277

No. 4.

FOREIGN OFFICE to COLONIAL OFFICE.

(Received August 13, 1904.)

Sir, Foreign Office, August 12, 1904.

I am directed by the Secretary of State for Foreign Affairs to transmit to you, to be laid before the Secretary of State for the Colonies, the accompanying copy of a despatch from His Majesty’s Consul at Dakar, transmitting a report on the Senegal-Niger Railway.

I am, &c.,

F.H. VILLIERS.

Enclosure in No. 4.

Captain C.F. CROMIE to the MARQUESS OF LANSOWNE.

(No. 13. Africa.)

Dakar, June 9, 1904.

My Lord,

I have the honour to transmit herewith to Your Lordship a report on the Senegal-Niger Railway.
I have, &c.,
C.F. Cromie,
Captain.

The Most Honourable
The Marquess of Lansdowne, K.G.,
&c., &c., &c.


As far back as August 7th, 1863, General Faidherbe, then Governor of Senegal, indicated that the junction of the Upper Senegal and Upper Niger was necessary for the development of French influence and commerce in Africa. In September, 1879, Admiral Jauréguiberry, Minister of Marine and Colonies, proposed to the Chamber the ways and means necessary to carry out this junction. In 1880 Admiral Cloué, who succeed him, demanded a credit of 8,552,751 francs for the construction of a railway between Médine, on the Upper Senegal, and Bafoulabé, a distance of about 136 kilometres (85 miles).*

Work was begun in December, 1881, Colonel Borgnis-Desbordes being charged with the direction of the railway in addition to that of the military works and operations. M. Amandeau was the engineer in charge, but soon fell ill and went home. He was succeeded by M. Jacquies in 1882–83.

At this time there were employed on the works 52 Europeans, 35 Chinese, 37 natives and 607 Moors, with the result that 17 kilometres (10½ miles) were laid at a cost of 156,000 francs per kilometre.

In July–August, 1883, 4,677,014 francs were voted by the Chamber, and in March, 1884, 3,300,000 francs more.

By the end of 1884 the line had been laid to kilometre 53; by 1886 to kilometre 60, and at last, in 1888, to Bafoulabe, kilometre 132 (82½ miles).

This line was extremely badly laid, the gradients were too steep and the curves too sharp. Wooden sleepers were employed, which were eaten by the white ants; the line was not ballasted; and there were no culverts to let off the water. There was no regular train service, trains being made up as required, and generally broke down before reaching their destination. In 1888, Colonel Archinard handed the line over to the military authorities, and it was entrusted to the Marine Artillery under Captain Klobb, by whom many improvements were effected.

In 1892 it was transferred from the Artillery to a detachment of the 5th Engineer (Railway) Regiment. Colonel Joffres, of that corps, became Director, and it is only since that date that serious work has been done. The line Kayes-Bafoulabé was practically reconstructed, and continued in the direction of Bamako.

* 1 kilometre to equal 5 furlongs.
The present Director, Colonel Rougier, of the Engineers, took charge in 1895, and the successful completion of the railway is in a great measure due to his energy and knowledge.

In November, 1903, the line was open for traffic as far as Tabaco Station, 359 kilometres (224 miles), and the first trains entered Bamako, 496 kilometres (310 miles), in May, 1904. The terminus at Koulikoro, 559 kilometres (350 miles), will probably be reached before October, 1904.

The progress was greatly delayed in 1902 owing to failure of water in the river Senegal, so that none of the materials could be brought up to Kayes, but remained on the quays at Dakar, Gorée and St. Louis until they could be brought up in 1903.

It was found necessary to prolong the line from Bamako to Koulikoro, about 63 kilometres (40 miles), owing to the fact that the Niger is not commercially navigable between those points as there is a rocky barrier forming a difficult rapid at Sotuba, 8 kilometres (5 miles) below Bamako. Koulikoro, therefore, is the head of the navigation of the Niger and the headquarters of the flotilla.

The Senegal-Niger Railway, whose object is to join those two great rivers, has its terminus on the river Senegal at Kayes, 556 miles from St. Louis, and will reach the river Niger at a point between 3 and 4 kilometres above Koulikoro, a small town 63 kilometres below Bamako, which was originally designated as the Niger terminus.

Both the Senegal and the Niger termini have been imposed by nature, Kayes is the highest point on the river Senegal which it is possible for steamers to reach, as just above it the river is barred by rocks. Similarly, it was found impossible to employ Bamako as the terminus, although this place, being a natural market and the point where several trade routes converge, was otherwise the most advantageous. Unfortunately, however, 8 kilometres below Bamako is a great rocky barrier, known as the Sotuba rapids, which completely blocks the navigation for all except native canoes. It was considered better, therefore, to continue the railway to near Koulikoro, from which place the navigation of the river Niger is absolutely uninterrupted as far as Ansongo, 605 kilometres (372 miles) below Timbuctoo, itself 950 kilometres (594 miles) from Koulikoro, making 1,555 kilometres (966 miles) of uninterrupted navigation from the railway terminus.

Above Bamako the river Niger is navigable most of the year as far as Kouroussa, 380 kilometres (237 miles), which is to be the terminus of the Conakry-Niger Railway (vide my report*). When, therefore, these two railways, the Senegal-Niger and the / Conakry-Niger are completed there will be uninterrupted communication by rail and river from Dakar, the port of Senegal now

* See p. 7.
being developed, and the Soudan on one side, and the port of Conakry, in French Guinea, on the other.

### To the Soudan.

<table>
<thead>
<tr>
<th>Kilometres</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dakar-St. Louis, by Dakar-St. Louis Railway</td>
<td>265</td>
</tr>
<tr>
<td>St. Louis-Kayes, by steamer on river Senegal</td>
<td>889</td>
</tr>
<tr>
<td>Kayes-Koulikoro, by Senegal-Niger Railway</td>
<td>559</td>
</tr>
<tr>
<td>Koulikoro-Timbuuctoo, by river Niger</td>
<td>950</td>
</tr>
<tr>
<td>Timbuuctoo-Ansongo</td>
<td>605</td>
</tr>
<tr>
<td></td>
<td>3,268</td>
</tr>
</tbody>
</table>

### To Conakry.

<table>
<thead>
<tr>
<th>Kilometres</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dakar-St. Louis, by Dakar-St. Louis Railway</td>
<td>265</td>
</tr>
<tr>
<td>St. Louis-Kayes, by river Senegal</td>
<td>889</td>
</tr>
<tr>
<td>Kayes-Bamako, by Senegal-Niger Railway</td>
<td>496</td>
</tr>
<tr>
<td>Bamako-Kouroussa, by river Niger</td>
<td>380</td>
</tr>
<tr>
<td>Kouronsst-Conakry, by Couakry-Niger Railway, about</td>
<td>550</td>
</tr>
<tr>
<td></td>
<td>2,580</td>
</tr>
</tbody>
</table>

The weak point of this line of communication is the river Senegal, which is only navigable for large ships during the whole year as far as Podor, and as far as Kayes during July, August and September. In October and November river steamers can generally go to Kayes and Bakel. The rest of the year navigation is conducted by lighters, a very slow and expensive process.

To remedy this inconvenience a mission has lately been studying on the ground the trace of a new railway, which, starting from the Thiés Station of the Dakar-St. Louis Railway, is to rejoin Kayes, thus doing away with the necessity of employing the river Senegal. This line, which would be about 750 kilometres, or 470 miles, in length, would ensure through communication between the port of Dakar and Koulikoro, on the river Niger. It is becoming more and more evident that, no matter what steps are taken to improve its navigation, the river Senegal will never be really reliable except during three months in the year.

The mission under Colonel Rougier, which in 1903 studied the trace of the proposed Thiés-Kayes Railway, found that it presented no difficulties of any kind, the greater portion of the country to be traversed being so flat that there is little to do beyond placing and ballasting the rails. There is only one bridge of any importance required, that over the river Falémé, not far from Kayes. The estimated cost is about 70 million francs (£2,800,000). It is proposed, and, I believe, practically decided to construct this line in the following manner:
The Senegal-Niger Railway, in 1903, made a profit of a little over 1,000,000 francs (£40,000). The proposal is to take one million as the average yearly profit, and on that as security to borrow 20,000,000 francs (£800,000). The line would then be begun simultaneously from Thiés and from Kayes. From Thiés a section about 250 kilometres (156 miles) in length would be built, passing through a country which exactly resembles the Coyor, where are grown the ground-nuts which have proved so profitable to the Dakar-St. Louis Railway, and which constitute the sole riches of Senegal. The population is the same, and it is confidently expected that, as in the case of the Dakar-St. Louis Railway, the people will begin to cultivate ground-nuts as soon as the rail affords the means of transport. If this expectation is realized, the first section will soon begin to pay. (In the case of the Dakar-St. Louis Railway the freight on ground nuts pays the whole of the working expenses, everything else being profit.)

At the same time a section about 75 miles in length would be built from Kayes to Bakel, which is open to navigation much longer than Kayes. It is expected that this section also would soon begin to pay. If these expectations are realized a further loan would be raised on the security of the profits of the section already in operation with which to complete the line.

As it stands the plan is to make the Senegal-Niger Railway pay for the beginning of the Thiés-Kayes Railway, which would then pay for its own completion.

It is to be noted that if the Thiés-Kayes Railway is constructed it will practically be the death blow to St. Louis, as, except during the three or four months of high water, nearly everything will pass by the railway, more especially as the Senegal river has a most difficult bar, whereas the fine harbour of Dakar is close at hand, and will be in direct railway communication with Kayes and Bamako.

From Kayes the line follows the valley of the river Senegal, and at once rises to the plateau above it. The valley is from 5 to 6 miles wide, fairly flat and covered with small trees, scrub and Guinea grass. The height and density of the grass makes passage through it difficult, so as soon as it is dry enough the natives are accustomed to burn it, when circulation is easy. The numerous small streams which feed the main river form a considerable obstacle. In the dry season, however, they dry up. The valley is bounded on either side by low hills, 500 to 600 feet high, forming an escarpment to a plateau which extends beyond them, with, as a rule, small parallel chains of hills divided by fertile and well-cultivated valleys. Most of the villages are to be found in these valleys. The formation is hard sandstone. Near kilometre 52 the hills have at some time been exposed to a tremendous erosion, as they become quite precipitous, with evident signs of water action. Here and there are isolated knolls, varying in size from 100 yards to a mile in length. They rise abruptly from the plain like the ‘droogs’ of Mysore. The upper part is quite precipitous, and even overhanging, the lowest consists of slopes formed by detritus which has fallen from above.

Nature of country traversed by Senegal-Niger Railway.
From the Senegal valley the line passes to that of the Bakhoy, which is similar in character to that of the Senegal. In neither case does the line pass very near the rivers, which are hardly ever in view. The country gradually becomes flatter, and the hills recede until just before Toukhorto the line crosses the Bakhoy (here divided into two arms by an island), by a long bridge. Nearing Kita the hills again approach the line, the town being situated close to the foot of a small mountain.

As far as the divide between the water-sheds of the Senegal system and the Niger, which is between the villages of Dio and Diago, the country remains the same – flat country traversed by numerous watercourses thickly clothed with Guinea grass, with trees 12 to 20 feet in height fairly close together, but not sufficiently to form an obstacle. After crossing the divide the difference is at once noticeable. The country, which is a high plateau, becomes more open, the Guinea grass less dense and less high, with many low shrubs scattered about, with real forest trees sufficiently close together to give a park-like effect. The vegetation has nothing African in character; many places might be in Europe. It is only in the actual beds of some of the watercourses that bamboos and dwarf palms appear. The villages also change their character. On the Senegal side they are composed of round thatched huts, frequently without an encircling wall; on the Niger side they are composed of square mud huts, running the one into the other, and thus forming a narrow street. The roofs are flat, and the village is always surrounded by a thick mud wall, with one or more narrow entrances.

At Kati the real descent into the Niger begins, but the railway has to traverse a high col (col de Nere) by means of a cutting about 450 yards long and some 30 feet deep. A long embankment at either end leads to the cutting. The line then follows the narrow and picturesque valley of the Farako until it debouches on the flat / cultivated plain of the Niger some 5 miles above Bamako. From this point the line follows the plain to its terminus at Koulikoro.

On the whole, with the exception of the numerous watercourses necessitating a great number of bridges, and the two cuttings of the Manambougou and Kati, the line passes through easy country. For the greater part of its length the only work necessary was clearing, levelling and ballasting. The result was attained by systematically following the river valleys, and the two cuttings just mentioned were unavoidable as being the only means of passing from one valley into another.

**Description of Railway.**

A single line of 1-metre gauge.

Rails. – Vignolles type; 6 metres long, 20 kilos. to the metre run.

Sleepers. – Steel, 33 kilos, in weight. Shape, construction, price and method of fixing rail to sleepers described in annexed official specification, with illustrations.*

* Not reproduced.
Points. – Hand, actuated by a counterweight.
When completed the line will be 559 kilometres, or 350 miles, in length, from Kayes to Koulikoro.

In October, 1903, the line was completed and open to traffic as far as Tabaco Station, 359 kilometres, about 225 miles. In May, 1904, it was completed to Bamako.

There is also a short branch line to Médine, 4 kilometres in length, which joins the main line 6 kilometres from Kayes.

In addition to the actual platform, which is 10 metres wide, the land for 50 metres on each side has been conceded to the railway throughout the whole of its length.

All materials must be purchased in France.

There are four classes of passenger carriages. 4th class consists merely of the open platform, where the natives sit on the top of their luggage. 3rd class are open at the sides, with wooden seats and curtains which can be let down to keep out the sun. 1st and 2nd are excellent corridor carriages with lavatory, the only difference being the upholstery, which is leather for the 2nd class.

The principle of construction adopted was what is known as the telescopic, the rails being pushed on behind the earthworks and masonry. At first a distance was adopted of 10 kilometres between the earthworks and advanced permanent way; this was found too near so 40 kilometres was subsequently adopted. In 1902, however, the system had to be abandoned altogether as, in consequence of the failure of water in the river Senegal, none of the material for the year could be brought up, but was left lying on the quays of Dakar and St. Louis, and was only brought up during the season of 1903. So as not to be obliged to stop work altogether the whole strength of the work was directed to pushing on the platform, with the result that when, in 1903, the material began to come up, the earthwork was finished to Koulikoro, and a great portion of the masonry.

The total length will be 559 kilometres, in addition to a small branch 4 kilometres long, which serves Médine.

The line will be open for traffic to the terminus at Koulikoro by the end of 1904.

Before commencing construction it was laid down as a principle that no gradients should exceed 25 m.m., and that no curve should have less than 300 metres radius, and this has been strictly adhered to.

Ballast is plentiful and good, and is laid to a depth of 40 centimetres.

The line is now being laid at the rate of 500 metres a day, work being so arranged by the Director that the materials in hand shall be exactly finished by the time the next year’s supply begins to be received at the high water of the river Senegal. By this arrangement no time is wasted, and there is less chance of the workmen having to wait in idleness for want of material.
The line is excellently and solidly laid, the bridges, culverts, &c., are well made and the trains run very smoothly. The worst part is the portion taken over from the old enterprise, which used to go from Médine to Bafoulabé. Although this portion has been greatly improved it is still rather unsatisfactory, and it is intended to entirely relay it, but not until the completion of the railway to Koulikoro.

Are very numerous owing to the quantity of small streams which have to be crossed.

The three longest are:
- Over the river Bafing at Mahina, 400 metres.
- Over the river Bakhoy at Toukhoto, 350 metres.
- Over the river Baoulé at Baoulé, 100 metres.

The smaller bridges are of 25, 20, 15, 10, 6, 5 and 4 metres.

They are all iron-girder bridges on masonry piers, and are, of course, imported from France.

Not very numerous considering the length of the line. There are two cuttings; the first at Manambougou, between Toukhoto and Kita, which is about 30 feet deep in hard sandstone rock, and about 800 metres long, the second at Kati, 440 yards long by about 35 feet deep in the centre. [...] There are no embankments exceeding 24 feet in height, and there are but few of these.

The important stations: Kita, Mahina, Toukhoto, Bamako and Koulikoro are one-storied buildings with an iron framework filled in with masonry. Four rooms below and four above. If one building is not sufficient for the purposes of the station extra ones can be erected; for instance, at Toukhoto there are four, one as station, one residence for employés, one as hotel and one as railway refreshment rooms.

Small stations are two square brick huts joined by a verandah, the whole roofed with thatch.

Kayes station is a heavy masonry building, and is a relic of the former enterprise. It will probably be changed.

There are repairing shops at Kayes, with iron and woodworking shops with modern machinery worked by steam.

At Toukhoto shops are in course of construction. A certain amount of work is being done there now, and when all the buildings are finished this will become the principal workshop of the railway. All the buildings are of stone or brick roofed with tiles. The bricks and tiles are made at Mahina. Later on, when the line is finished, there will also be a small repairing shop at Koulikoro.

At Toukhoto is situated the oil factory, where the oil for greasing the wheels is made from ground-nuts. The press is made by Messrs. Greenwood and Batley, Leeds. The oil costs 80 to 85 centimes a litre, the refuse being used to fire the engine which drives the press. 5,000 litres a month are used. At Toukhoto there
is also an ice machine, which supplies the employés of the railway with ice. It is made by / Douane, of Paris, and the system is the expansion of chloride of methyl. It is worked by the same engine as the machines in the workshops. The ice is very good and clear, and does not melt very rapidly.

At several points on the line where calcareous rock has been found, Fouti, Dinguirah, Toukhoto and kilometres 221 and 225, lime-burning plants have been erected, and all the lime necessary for the masonry work of the railway is now made locally. Formerly, most of it was imported at great expense.

At each station there is a double line for crossing purposes, and sidings at Kayes, Mahina, Kita, Toukhoto, as required for commercial purposes. At Kayes there are two combined end- and side-locking docks, but, generally speaking, at present there are neither station platform nor loading docks.

Water is plentiful, and is found everywhere, both for watering and for drinking purposes. It is always advisable, however, to filter or boil the water for drinking.

There are watering facilities at every station. There are three types of watering appliances: (1) For small station – a hand-pump with a stand-pipe by the line. This gives 150 litres per hour; (2) For medium stations – steam-pump, giving 4,000 to 5,000 litres per hour, which fill large elevated iron cisterns; (3) For large stations – steam-pumps, giving 4,000 litres per hour, which fill large elevated iron cisterns.

*Vide* annex, and illustrations Nos. 6 and 7.

Construction. Workmen. As the natives of the country were not prepared to work of their own accord, recourse had to be had to what really amounts to forced labour. The number of workmen required are recruited by the Civil Administration, each district having to supply a given number of men. They are enlisted for one year, during which time they are fed and paid. The rate of pay is from 60 centimes to 1 franc a day, and the ration {½ kilo rice or 1 kilo, millet,} 30 grammes mutton, 15 grammes salt.

After the expiration of their year the men are at liberty to return to their districts, and many do so, but, on the other hand many having got used to the work remain voluntarily. For instance, in October, 1903, of 5,000 workmen employed 3,000 are old hands who have remained voluntarily after finishing their year.

After the capture of Samory, 500 of his Sofas (or soldiers) who had been taken prisoners were sent to work on the railway. The Administration found them, as a rule, more intelligent than the Bambaras, and most of them have become useful artisans, masons, &c. These men, although long since released as prisoners, have all remained on the railway of their own accord. There are many Senegalese employed as artisans; they receive from 4 to 6 francs a day. Non-commissioned officers and sappers receive francs 2.50 a day working pay, in addition
to their ordinary pay. There are some civil European employés who receive 6,000 francs a year.

All engine-drivers and firemen are natives, either Senegalese or Bambaras, and have proved, as on all the other French West African railways, quite satisfactory. The highest wages paid to an engine-driver is francs 240 a month.

The superintendent of the engine-shed is a European, and inspects every engine before it goes out. He also superintends cleaning and repairs.

At important stations the station-master is a non-commissioned officer or sapper of Engineers; at small stations natives are employed. As they must have a knowledge of telegraphy a good many come from the schools of the White Fathers.

At present, October, 1903, the actual personnel of the Soudan Railway is as follows:

- **Director** – Colonel Rougier, Engineers.
- **Traffic Manager and Traction** – 1 Captain and 1 Lieutenant.
- **Permanent Way and Buildings** – 1 Captain, 1 Lieutenant.
- **Construction** – 1 Major, 1 Captain, 1 Lieutenant (this is only until construction is finished, say, 1906).
- **Accountant for Finance** – 1 Engineer Paymaster.
- **Accountant for Material** – 1 Engineer Paymaster.
- **120 non-commissioned officers and sappers.**
- **5,000 native workmen, &c.**

This service is not only responsible for the upkeep of the permanent way, but also undertakes the manufacture of lime, bricks, tiles, ice and oil.

The service is divided into sections and districts. A district comprises usually about 20 kilometres, or from one station to another, and is commanded by a corporal or sapper. They have a gang of from 20 to 25 natives, under a native ganger.

A section is formed by grouping several districts under a sergeant or superior non-commissioned officer. Every morning the district chief must have gone over the whole of his district before the passage of the first train. As a rule he travels by trolley pushed by natives.

On the whole, especially considering the fact that much of their work compels them to be out of doors during the hot part of the day, the health of the European personnel is fairly good. An average of about 10 per cent, are usually in hospital, but, as a rule, only with simple malarial fever without pernicious complications. Deaths are comparatively few, and as the line approaches completion the personnel will have more indoor work and be less exposed during the day. All are provided with mosquito nets and are encouraged to take preventive quinine. The country traversed is comparatively healthy, Kayes itself being the most unhealthy point owing to the existence of marshes in close proximity to the town. These are, however, being gradually filled up, and the head offices of
the railway are now established on the plateau above the town, where the climate is much better.

There is a well-organised medical service, and the doctors are posted at convenient points along the line, such as Kayes, Toukhoto and at rail-head.

It is almost impossible to calculate what was the cost of the first 109 kilometres. Large sums of money were voted ostensibly for the railway, but there is every reason to believe that much of this money was not used for that purpose. The period of conquest was in full swing and the officers commanding in the Soudan often found their military operations hampered by want of funds. Under the circumstances they did not hesitate to apply the money voted for the railway towards the really more important purpose of conquest.

From the 109 kilometre, however, to the end of the line at kilometre 559 or 450 kilometre, there will have been expended the sum of 30,000,000 francs, that is at the rate of 66,000 francs per kilometre. Of this amount 26,000 francs per kilometre has been expended locally, and 40,000 francs on material imported from France.

There is no telephone or special signalling system.

A telegraph line follows the railway, and there is an apparatus at each station, as a rule worked by the station-master.

At first the telegraph wires were carried on wooden posts and growing trees, where these were found conveniently situated. These have nearly all, however, been replaced by steel posts of two types:–

(a) Round telescopic posts;
(b) Steel girder pattern, four sided. These latter are to supersede the other in time.

There are still some miles of wooden posts towards railhead, but gangs are at work replacing them by girder poles.

There are five wires, three belonging to the railway and two to the civil administration.

The fuel used is coal briquettes or patent fuel. It costs, delivered at the terminus at Kayes, 120 francs a ton.

Three trains a day up and down; of these one is a material train, the other two merchandise.

One passenger train a week leaving Kayes on Thursdays.

One extra one on Mondays if passengers offer.

Appended is the time table for October, 1903, with the distances of stations. Those marked* are not opened for traffic yet (October, 1903).
Per Kilometre.

- 1 to 150. 150 to 350. Exceeding 350.

Passengers:–
1st class 0.35 0.28 0.20
2nd class 0.20 0.16 0.12
3rd class 0.12 0.10 0.08
4th class 0.05 0.05 0.05

Goods by passenger train, including passenger’s luggage:–
Per ton of 1,000 kilos 1.30 1.20 1.00

Goods train:–
Per ton:–
1st category 1.20 1.00 0.80
2nd category .80 .68 .40
3rd category .30 .20 .10

N.B. – 1st category includes feathers, ivory, kolas, stuffs; 2nd – gum, coffee, cocoa, karité, wines and spirits, preserves, foodstuffs, machinery, rubber, manufactured materials for construction; 3rd – ground-nuts, rice, maize, bamboos, sweet potatoes, millet, salt, primary building material, coal, &c.

- 1 to 150. 150 to 350. Exceeding 350.

Animals:–
Cattle, horses, mules .30 .25 .20
Donkeys, foals, ostriches .16 .12 .10
Sheep, pigs, dogs, calves .06 .05 .04

There are special reductions for complete truckloads.

Tonnage Carried by the Railway.

<table>
<thead>
<tr>
<th></th>
<th>1899</th>
<th>1900</th>
<th>1901</th>
<th>1902</th>
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<tr>
<td>Total tonnage</td>
<td>5,600</td>
<td>5,800</td>
<td>5,100</td>
<td>6,600</td>
</tr>
<tr>
<td>Kilometric tons</td>
<td>800,000</td>
<td>900,000</td>
<td>600,000</td>
<td>1,100,000</td>
</tr>
<tr>
<td>Passengers</td>
<td>44,000</td>
<td>44,000</td>
<td>36,000</td>
<td>41,000</td>
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</tbody>
</table>

N.B. – In 1901 the river Senegal did not flood and large quantities of merchandise were left at St. Louis until 1902. /

Imports.

<table>
<thead>
<tr>
<th></th>
<th>1899 and 1900</th>
<th>1901</th>
<th>1902</th>
<th>1903</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt</td>
<td>300</td>
<td>350</td>
<td>1,100</td>
<td>1,500 to October.</td>
</tr>
<tr>
<td>Sugar</td>
<td>100</td>
<td>175</td>
<td>200</td>
<td>–</td>
</tr>
<tr>
<td>Cottons</td>
<td>600</td>
<td>450</td>
<td>600</td>
<td>–</td>
</tr>
</tbody>
</table>

The above figures are approximate.
Construction of Foreign Railways in West Africa

<table>
<thead>
<tr>
<th>Rubber</th>
<th>1899</th>
<th>1900</th>
<th>1901</th>
<th>1902</th>
<th>1903 to October</th>
</tr>
</thead>
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<tr>
<td>T.</td>
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<td>T.</td>
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</tr>
<tr>
<td></td>
<td>150</td>
<td>300</td>
<td>200</td>
<td>300</td>
<td>700</td>
</tr>
</tbody>
</table>

In 1895 the receipts amounted to 94,000 francs from the public and 166,000 francs from the State.

In 1901 they amounted respectively to 231,000 francs and 135,000 francs.

Chemins de fer de Kayes au Niger. – Kayes à Koulikoro.

Aller.

<table>
<thead>
<tr>
<th>Distance (Kilo)</th>
<th>Stations</th>
<th>Train 1</th>
<th>Train 2</th>
<th>Distance (Kilo)</th>
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ANNEX.

10 A.

**Locomotives et Materiel roulant.**

Locomotives (all tank, no tenders).

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<td>Three wheels coupled Type Huvenoit</td>
<td>... marchandises 26 à vide bogie 10 /</td>
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* Not opened for traffic yet (October, 1903).
Mr. Lyttelton to Governor Egerton (6 January 1905); held at the National Archives, CO 879/76/695.

42513
No. 156.

LAGOS.

Mr. LYTTELTON to GOVERNOR EGERTON.¹

(Confidential.)

Sir,

Downing Street, January 6, 1905.

I have the honour to acknowledge the receipt of your despatches, No. 370A, of the 14th, and confidential, of the 26th of November,* on the subject of the extension of the Lagos Railway to Oshogbo.

2. I gather that the former of these despatches was written chiefly with two objects: (1) to secure the early execution of detailed surveys of the route; and (2) to deprecate the construction of the line by contract. As you have since been informed that the location survey party was despatched early last month, and that the idea of constructing this line by contract has been abandoned, I need not dwell any further on these points. But in both the despatches under acknowledgment you have expressed certain views as to the system on which the line should be constructed, and I have, after consulting the Crown Agents for the Colonies and the consulting Engineers, given careful consideration to those views with the object of ascertaining how far it is possible to give effect to them.

3. I transmit to you a copy of the reply† received from the Crown Agents and the Consulting Engineers to the letter of the 4th of November, enclosed in my confidential despatch to you of that date,‡ and a copy of the further letter§

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* Nos. 140 and 147.
† No. 149.
‡ No. 128.
§ No. 157.
which I have caused to be addressed to them. You will see that Messrs. Baker and Shelford recommend that the work of construction should not be placed in the hands of the General Manager and the Open Lines Department, but that an independent Resident Engineer should be employed, and that I have acceded to this view. So far, then, the system of construction will remain the same as that on which the existing lines have been built, both in Lagos and in the other West African Colonies. But it has been arranged to take advantage of the presence of the Open Lines Staff by giving them facilities in two ways for advising you on the work while it is in progress. The correspondence between the Resident Engineer and the Consulting Engineers will be passed under flying seal through the General Manager and yourself, and the work will also be subject to personal inspection from time to time by the General Manager and the officers of his department whenever you may think it desirable to order such inspection. You will thus, in exercising the general supervision over construction which previous Governors have exercised, have the benefit of independent advice from your own officers on the spot, who, in addition to possessing general knowledge of railway engineering and administration, will also have had experience and knowledge of local requirements and resources, and who are themselves the men who will afterwards have to work the line.

4. A very important question in connexion with the work will be the division of responsibility between the Resident Engineer and the Consulting Engineers. In the 5th and 8th paragraphs of your confidential despatch of the 26th of November,* you point out very rightly that in a large work of this description the Government ought to have an adviser who is in a position to criticise those who are responsible for the execution of the work, and that, if the Consulting Engineers are so identified with the work done by the Resident Engineer as to be regarded practically as the constructors of the line through a local agent, they cannot be expected to bring to notice errors for which they would themselves be held responsible. It is, therefore, desirable to keep as separate as possible the functions of the consulting and executive officers. The ideal course in order to effect such separation would probably be, that a thoroughly able and reliable Resident Engineer should be appointed to do the work; that he should be given as free a hand as possible, not subject to the detailed control of the Consulting Engineers, but subject only to their guidance in matters specifically referred to them; that the Consulting Engineers should be responsible for the selection both of the Resident Engineer and of the rest of the European staff, for the selection of material upon indents forwarded by the Resident Engineer, and for the advice which they may give to that officer on any technical points referred to them; and that the whole of the residual responsibility for carrying out the wishes and orders of the Government should be centred in the Resident Engineer. Unfortunately, the special circumstances of West Africa render it impossible to carry out such
a system strictly. It would be a matter of very great difficulty to obtain for West Africa the services of a Resident Engineer of such professional standing and so thoroughly competent in every way that the complete confidence involved by this system could be reposed in him; and, quite apart from that difficulty, the frequent changes in the office of the Resident Engineer due to leave, invaliding, and so on, would inevitably lead to great confusion in the work, and would result in the responsibility being so divided between successive Resident Engineers that errors could in few cases be definitely laid to the charge of any officer. The Consulting Engineers for the West African Railways have therefore found it necessary in the past to take a much more active part in the direction of the work of construction than has been usual in other colonial railways. They have given instructions on many points of detail to the local staff, have anticipated by letters of advice the probable difficulties which the Resident Engineer would meet, and have frequently sent out rails and other material (ordered by the Crown Agents on their recommendation in the usual manner) without waiting to receive requisitions from the Colony. The assistance which they have thus given, although on a strict view outside their proper functions as Consulting Engineers, has undoubtedly been of great advantage to the efficiency of the work; but one result of it has unfortunately been a tendency on the part of the public, shared to some extent by the Colonial Governments, to identify them more completely with the work of the local engineers than was really justifiable. It is clear, however, that from this country the Consulting Engineers can effectively exercise only a limited control over the local engineers, and that the detailed execution of the work and a large part of the expenditure incurred are beyond their control. It is, therefore, hardly either practicable or fair to place the whole responsibility upon them; and I have also pointed out to them that the difficulty to which you draw attention, namely, the need of the Government for independent technical advice on the work of the executive officers, is a very real difficulty. It has therefore been arranged that while, for the reasons alluded to above, they will continue to give active assistance in various ways to the local officers, they will emphasize in their instructions to Mr. Bradford, the Resident Engineer, that a wide discretion is to be allowed to him in following their instructions, and they will maintain themselves in a position to give independent criticisms to the Colonial Government and the Secretary of State.

5. Such a relaxation of the hold kept by the Consulting Engineers upon the work might have been attended in the early days of railway construction in West Africa by serious disadvantages, and even by some danger of the work collapsing entirely; but now that the special difficulties of construction due to the nature of the country, the climate, the labour conditions, &c., are better understood, and it is possible to send out an engineer in charge like Mr. Bradford, with long, successful experience of those difficulties, the danger is much reduced, and may be
regarded as outweighed by the advantages of giving a free hand to the Resident Engineer and retaining the Consulting Engineers as independent advisers.

6. It is proposed that as each section of the line to Oshogbo is completed and handed over to the Open Lines Department, it should be inspected and reported upon by an engineer of undoubted competence specially selected for the purpose by the Consulting Engineers and acting under their instructions.

7. The Resident Engineer will, of course, be, as hitherto, a servant of the Colonial Government, subject to any orders which the Governor may give him; but I need hardly point out to you that it is desirable that the Governor should not intervene in his work unless necessary, so as not to impair his responsibility, and that, when the views of the Colonial Government are opposed by him on technical grounds, the advice of the Consulting Engineers should always be obtained before deciding against his opinion.

8. With the experience gained during the construction of the existing lines, it is hoped that it will be possible to exercise a better control over the expenditure on railway construction in future. The salaries of the European staff employed will be regulated by the enclosed correspondence,* and you will see that allowances will be paid on a scheme to be settled by the Resident Engineer, subject to your approval. In this connexion I may observe that although appointments and promotions will usually be made on the recommendation of the Consulting Engineers, it does not appear to me that this fact will disqualify them from reporting on the conduct of the staff any more than the Governor of a Colony is disqualified from reporting upon officers in the ordinary service of the Colony. Moreover, the Crown Agents could not select the staff without professional advice, and the delay and difficulty which would be inevitable if an attempt such as you suggest were made to get a continuous supply of men from India renders any such course impracticable.

9. Native labour will be engaged with the co-operation of the Open Lines Department, so that the wages paid may not be unnecessarily high; and I trust that this co-operation will be cordially extended to other branches of the work. The whole of the local construction accounts will be audited by the Chief Accountant of the Open Lines, acting (with the assistance of his department) as a local auditor under the instructions of the Comptroller and Auditor General. I attach much importance to the prompt examination of the accounts by the Accounts Department of the Open Lines as a means of checking expenditure, and instructions should therefore be given to the Resident Engineer to see that the accounts are kept up to date and always available for audit. It must be clearly understood that it will be the duty of the Chief Accountant as auditor to watch the rates paid for contracts, labour, &c., as well as the correctness of the

* Nos. 145, 150, and 152.
accounts, and to see that a proper system is maintained of supporting expenditure by receipts, vouchers, and other documents.

10. Mr. Butler Wright, in his minute of which a copy is enclosed in your despatch, No. 370A, of the 14th of November,* points out that in the construction of the present line detailed returns of the cost of each item of the work have not been kept. The Consulting Engineers, with whom the matter has been discussed, have explained that this system involves a great deal of labour and expense, is cumbersome and unreliable when used, and has been deliberately avoided hitherto in West Africa. They state that comparison of cost with the estimate is obtained more simply by the method adopted of monthly summaries of cost compared with the estimate under each head of the estimate, together with the monthly report of the work done. It is, however, quite open to you to ask the Resident Engineer for such returns as you desire, so that you may judge the work in the way you wish; and the scheme of organisation arranged by the Consulting Engineers, under which each department of construction will be open to the inspection of the corresponding department of the Open Lines, will help you to obtain the information which you may require.

11. With regard to your proposals for carrying out the location survey for the line, either in ten-mile sections or over the whole distance, and obtaining the approval of yourself and the Secretary of State before the commencement of any construction work, it is estimated by the Consulting Engineers that these proposals, if adopted in full, would involve a delay of eighteen months to two years in the completion of the railway, which at the present stage it would not, in my opinion, be desirable to incur; and the survey of one or more alternative routes before commencing construction, while it is very desirable in itself, would also be impracticable without indefinitely prolonging the construction of the railway. The Consulting Engineers agree, however, that it will be advantageous to push on the survey of the extension as far as possible ahead of construction, and they will arrange that, except in the case of the first few miles of this extension, plans and sections should be sent home to them for approval or criticisms before construction is commenced. You will be able to see these plans and sections on their way home, and will have an opportunity of making any remarks upon them and of acquiring any information which you may desire. The Consulting Engineers are, however, confident that any serious errors in survey or alignment are unlikely to occur while Mr. Bradford is the Resident Engineer, as he is an expert at this class of work.

12. The remarks which you make as to the general location and grading of the line, the employment of engineers of tropical experience, the giving out of small contracts to local native contractors, and so on, have been communicated

* No. 140.
to the Consulting Engineers, and you will no doubt discuss your views with Mr. Bradford on his arrival in Lagos. I will only touch here on the question of curves and gradients, as to which I invite your reference to the 7th paragraph of my despatch* of the 5th of December last, in which the general history of railway construction in West Africa was reviewed. You will see from that despatch that certain maximum curvatures and gradients were adopted on the basis that it was only necessary to provide in West Africa for an average speed of 15 miles an hour.

13. It is not clear to me why you do not think it possible that an expenditure in excess of £75,000 can be economically incurred on the Oshogbo extension during the year 1905–6. It is certainly not necessary in this case, as it was in that of the Gold Coast Railway, to push on the lines with the utmost possible speed and to sacrifice economy and other considerations to rapidity of construction; but, on the other hand, it is obvious that when a highly-paid staff of engineers is employed on a work, it is a waste of expenditure to let the work proceed so slowly that they are not fully employed. There is, in fact, an ‘economical speed’ of construction lying between the two extremes, and this is the speed at which the work should, as far as practicable, be carried out.

I have, &c.,

ALFRED LYTTELTON.

* No. 2 in [Cd. 2325]
MEMORANDUM BY MR. CHURCHILL ON RAILWAY CONSTRUCTION IN NIGERIA.*

I.

The Secretary of State recognises in principle the need and advantage of –

(a) a 3-feet 6-inches line from Lagos to Ibadan and on through Oshogbo and Ilorin to Jebba. This line is already constructed to Ibadan and is in process of extension to Oshogbo. The necessary funds to be raised by Southern Nigeria upon its own credit; and

(b) provided that Sir F. Lugard is able to establish his estimate of £2,000 per mile, a 2-feet 6-inches line from Baro to Bida, Zungeru, Zaria, and Kano, to include the 21 1/2 miles of tramway already constructed near Wushishi; the cost to be met out of Imperial funds.

The first is a railway trunk line, permanent and commercial;

The second is a tramway for strategic, administrative, and development purposes.

II.

These two schemes appear discordant, and are admittedly for the moment disconnected. Northern and Southern Nigeria are for the present to work out their fortunes on separate lines. But no ultimate divergence or separation is intended.

It will be three years before the Lagos line has reached Ilorin and no practical divergence can arise till then; for till the Lagos railway reaches the Niger (at

* This Memorandum (without the addendum) is also printed as African No. 850.
least one year later) no traffic that it could have carried will be diverted down the Niger by the Baro-Bida-Zungeru tramway.

On the other hand, as the Lagos Railway cannot afford any help to Northern Nigeria until it reaches the Niger, no reason exists for forcing Northern Nigeria to arrest its development and suspend its security pending the arrival of the Lagos Railway.

III.

Before the Lagos Railway reaches Ilorin, three years hence, we shall know for certain (1) the commercial value of that road; (2) the amount which it will cost to improve Lagos Harbour so as to admit ocean steamers, as to which definite proposals are now on foot; (3) the best point to cross the Niger; (4) the profit, cost, and practicability of the greater part of the Baro-Kano tramway; (5) whether the commercial advantages of the Jebba-Zungeru route justify the extension forwards of the 3-feet 6-inches Lagos Railway, or only a kick-back of the 2-feet 6-inches tramway.

IV.

More important still, the amalgamation of Northern and Southern Nigeria will probably be an accomplished fact, and all need of deciding between their respective claims, or disputing as to their respective revenues, will be at an end.

V.

The conclusion therefore is, that the extension of the Lagos Railway to Jebba, and the ultimate connection of Jebba with Zungeru, may be sanctioned, and funds may be provided for the work as far as Jebba (including the Niger bridge) forthwith; but that this policy should be reviewed when the railway reaches Ilorin in the light of all the facts referred to in III. and IV., which will be by then established.

VI.

The ground is now clear to consider the Baro-Kano tramway. It is proposed that this should begin at the head of the perennially navigable reaches of the Niger either at Baro or at Lokoja and thus give Northern Nigeria an immediate air-hole / of its own. Its justifications are first strategic and political. So great an extent of country cannot be conveniently held for an indefinite period by a considerable force of drilled troops in garrison unless buckled together by at least one central line of rapid communication. Large military economies and greater security resulting, first, from increased mobility and accessibility enabling fewer troops
to do more work, secondly, from the reduced expense of maintaining and supplying such troops in garrison, thirdly, from the improvement in the conditions of their service (food and housing) and consequently of their health (especially in the case of expensive white officers), are to be counted on. The effective occupation of a territory now precariously and loosely held, and the more complete fulfilment of our responsibilities to the natives over whom we have declared a Protectorate and to the foreign powers with whom we have made boundary conventions, are the political advantages. These are sufficient in themselves to justify a considerable amount of not directly remunerative expenditure; but additional to them is the prospect of the speedier development of local trade on which ultimately the capacity of the country to yield revenue depends.

The construction of the tramway, besides tending actually to increase the volume of production and trade, would have the effect of attracting in the direction of the Niger and the sea the existing trade of the inland Hausa states. The French across the border are eager competitors for this trade, seeking to maintain it in its present channel, through territory controlled by them, across the Sahara as to bring it to the Niger at the point where their own railway from Dahomey will eventually cut that river. A year may be of importance in the race, and a tramway built now may succeed in preserving Northern Nigeria trade which even a trunk line of railway would be unable to recover some years hence. Perhaps even more important is the prospect which the tramway opens up of a large increase in the export of cotton. The British Cotton Growing Association see in Northern Nigeria a most fruitful field for their labours, and are keen advocates of a railway to Kano, not only as facilitating the work which they propose in any case to undertake, but also as enabling them to open up areas of production which otherwise lack of transport would compel them to leave untouched. The prospect in this direction might almost of itself be said to be an adequate inducement to build the line.

VII.

Sir F. Lugard asserts that such a tramway can be constructed at a cost of £2,000 a mile if made departmentally by the Public Works Department of the local Government without constituting a special department for the purpose or employing Consulting Engineers. His figures are challenged by the Consulting Engineers, who point to the estimates made by them after a careful survey of the proposed route by competent engineers. The estimates of the Consulting Engineers, being put forward upon high expert authority, are unassailable by laymen; Sir F. Lugard states that the cost per mile of the Wushishi tramway was only £1,460. The Consulting Engineers contend that this figure is inadequate, because:–
(1.) Services were rendered by various departments of the local Government which have not been debited to the cost of construction and distributed over the mileage.

(2.) The line originally loosely constructed has subsequently been improved and perfected.

(3.) It is a specially easy stretch.

(4.) Even were the figure of £1,460 per mile correct for the Wushishi tramway, it could not serve as an accurate basis for the larger scheme, because the assistance which it has been in the power of the local Government to extend to a construction averaging only ten miles a year would not be sufficient to sustain a construction of 70 or 80 miles a year without definite expansion in the Public Works Department, and increased transport for carriage of materials, each involving a definite increase in expenses.

In regard to the first two points it may be answered that departmental assistance means local economies which are clear gain to the State; and that the interest of every officer and official in the building of the railway and its maintenance, if it were carried on by the local staff, would be the surest device for promoting thrift throughout the Protectorate.

In so far as such assistance can be given without any increase of the existing staff or existing means of transport, it is not fair, in discussing the practical question whether it is worthwhile to build the line, to claim that the line should be debited with the cost of services rendered, however necessary such a course might be from a strict accounting or audit point of view.

In regard to the third point, although the section occupied by the Wushishi tramway is less difficult than the section from Zungeru to Zaria, it is not much, if any, less difficult than the stretch from Baro to Zungeru. The report of the Consulting Engineers on this section says that it is ‘very easy,’ and that ‘a surface line was obtained for 62 per cent of the distance,’ the only heavy work being the crossing of the Bako river, which would be expensive. In reply to the fourth point, the average cost per mile of the proposed line is taken at £2,000 and not at £1,460, thus leaving a margin of £540 per mile to cover any increased cost which the extended scale of construction would involve.

VIII.

The best way of testing Sir F. Lugard’s estimate is, perhaps, as follows. The Crown Agents can give us the actual cost of the materials for the existing Wushishi line, including rails, sleepers, rolling-stock and anything else sent from England, with the cost of freight to the mouth of the Niger. We can also ascertain definitely the amount of salary and the cost of the passages of the one or two men specially engaged for helping in the construction. Sir F. Lugard alone can say how the
balance of his figure of £1,460 a mile for the existing line is made up. He should be asked to do so, showing clearly what was paid for local labour, what, if anything, was paid for transport of materials from the mouth of the Niger in vessels other than those belonging to Government, or by native carriers, and what was expended on materials locally. To make out such a statement he will probably have to refer to the accounts of the Protectorate. His Treasurer is at home on leave, and will no doubt be able to obtain the necessary figures from the accounts rendered to the Comptroller and Auditor-General.

Sir F. Lugard should, if possible, state in addition what officers of the Protectorate Staff, whether of the Public Works, Medical, Transport, or any other Department, assisted in the making of the existing tramway, and whether such assistance took them away from their ordinary duties largely or entirely, or was rendered incidentally. He might be asked, if possible, to put a money value on the services so rendered. It is probable, however, that any figure be could give would be little more than a rough guess.

With this information the Secretary of State will be in a position to form some opinion as to the accuracy of the figure of £1,460 per mile for the existing line.

Taking as a basis whatever figure per mile may have been arrived at by this process, Sir F. Lugard should then explain to what extent the greater scale of the present proposal will affect the cost. He should say whether he is deliberately of the opinion that a line of 400 miles can be built at a greater speed than the existing line of 21 1/2 miles by the existing Protectorate staff without neglecting unduly other works of importance, or whether additional officers will have to be engaged for the construction; and, if so, how many, and at what cost, whether engineers, doctors, or others. He should say also how the greater quantity of materials will affect the Government transport. Will it involve the hire of additional steamers, canoes, or carriers, or the payment of extra freight to the Niger Company?

IX.

If Sir F. Lugard is able to sustain his calculations to the satisfaction of the Secretary of State, the case for construction is established. It is perhaps unlikely that this will be done, and whatever the Secretary of State decides, grave elements of doubt will remain. Even so, assuming that the arguments are nicely balanced, the plan should not be abandoned without actual experiment. In this way only can certainty be achieved. /

Little is risked by having Sir F. Lugard’s figures resolved by practical proof. Some railways are useless till they reach a certain point. The desert railway in the Soudan from Wady Halfa was useless till it struck Abu Hamid and the Nile; the
Simplon tunnel till it was finished; the Uganda railway had a definite objective in the lake. Not so the Baro-Kano tramway. Every mile counts. Every mile constructed saves absolute manual portage of indispensable supplies, and increases military mobility. Therefore all the advantages detailed in paragraph VI, which are to flow from this line will not be withheld till its completion, and are not involved in reaching any particular point, but will be reaped evenly over the whole mileage as, and in proportion as the line is constructed. Therefore in this Baro-Kano tramway, as in the Lagos railway, it is possible to proceed tentatively, and necessary to proceed gradually; and as the first steps are sure in themselves, they will not be useless if unexpected circumstances or further consideration involve arrest or modification of the plan.

X.

Where, then, should construction – either definite construction, in the event of the figures being proved, or experimental construction in the event of doubt remaining – be begun! The section from Baro, or perhaps Lokoja, to Zungeru is the first and the most obvious. It connects immediately with a fairly accessible port on the Niger. It relieves Zungeru of dependence on the uncertain and sometimes useless waterway of the Kaduna, and brings the seat of administration within easier reach of the sea. It taps the district in which the first operations of the British Cotton Growing Association are to be undertaken. It is so situated that construction could be begun from both ends at once, and possibly, if greater speed is practicable and desirable, from some intermediate point also. Perhaps its chief claim is that, even if it starts from Baro, it brings the tramway within a comparatively short distance of Lokoja; and the British Cotton Growing Association in their memorandum for the Prime Minister have pointed out that it would be advisable to extend the railway as soon as possible to some point near Lokoja, or even to commence operations there. Lokoja, situated at the confluence of the Benue and the Niger, seemed destined to be the commercial centre of the Protectorate. It will be a matter of first importance to connect it with any line of railway that is eventually driven through Northern Nigeria, and a moderate extension southwards of the tramway between Baro and Zungeru would effect the connexion at trifling cost, whether the main railway ultimately is the tramway itself or a prolongation of the Lagos-Jebba line. Viewed in this light the tramway between the Niger and Zungeru is the first and larger instalment of a work which will eventually in any case be indispensable.

It should be stipulated that, if the tramway between the Niger and Zungeru is completed before the Lagos Railway reaches Ilorin, about three years hence, no further extension should take place until the Lagos Railway has reached Ilorin and the revision of the general railway policy of Nigeria contemplated...
in paragraph V. above has taken place. Some such arrangement is required to avoid prejudicing the question of the gauge of the trunk line northwards from Zungeru, that being the point at which the 3-feet 6-inches Lagos Railway, if extended into Northern Nigeria, will cut the 2-feet 6-inches tramway.

July 14, 1906. W.S.C.

ADDENDUM.

NOTE BY Sir F. LUGARD UPON PARAGRAPH VIII. OF THE ABOVE MEMORANDUM.

1. The total cost of the tramway, including rolling stock, was £31,505 3s. 5d., viz., £1,432 per mile. I had a detailed statement of how this had been expended, but unfortunately I appear to have left it in Northern Nigeria. I have written to the Comptroller and Auditor-General for the accounts. If not available the question can be asked by telegram, material, local construction, freights (river and sea) (other than Government vessels), and temporary foremen being shown separately. Any local material used (viz., material borrowed from other works), would have been charged to the railway. Since then the following sums have been spent:– Flooring and protecting bridges, estimate £180, actual £137 10s. (I think these were railway bridges only.) Station at Zungeru, estimate £400, actual £395. Saloon carriage, estimate £260 (Crown Agents). Accounts not yet received.

2. The pay of any foreman on temporary agreement, who was employed on the railway, would (like material) necessarily be charged against the railway account. There is no other way of meeting the charge. The salaries of officials on the permanent staff who were employed on the railway are provided under the head ‘Personal Emoluments, Public Works Department,’ and would not be so charged. Had the tramway not been constructed they would have been equally employed in transporting the building material to Zungeru. In fact, a special staff would have to have been engaged. The ordinary duties of the Public Works Department were carried out. They consisted in those two years chiefly of erecting the houses and other essential buildings at Lokoja and Zungeru, and the transport of material from the Kaduna to Zungeru was an integral part of the latter. No medical or other Departmental Officers were especially employed on the railway works. The Marine and Political Officers rendered assistance in river transport, engagement of labour, &c. It is a part of their duties. It would be impossible to put a money value on such services, – they were purely incidental. I rather think that a vessel of the Niger Company was chartered in each of the two years, and charged to the Marine Vote. If so, it should be added to the railway cost. Its inclusion would not greatly add to the cost per mile.
3. Undoubtedly the greater scale of the present proposal and the number of miles it is proposed to construct annually will necessitate a larger temporary staff of foremen, &c., which may add a little to the cost per mile. On the other hand a decrease should be effected by the possibility of ordering considerable consignments at one time, and bringing the material by contract without transhipment direct from Liverpool to Baro. Of course additional men, chiefly foremen, will be engaged for the construction, and their salaries debited to construction – this is provided for the estimate. I cannot say how many, without prior consultation with Mr. Eaglesome, and, indeed, he himself would be guided by the progress of the work, – the supply from England of material, &c. A greater or less number of expert supervisors would make little or no difference provided there was no hitch in the supply of material. The cost per mile would remain the same, the rapidity of construction would be affected. Other works of importance, viz., up to the limit of the sum available in the estimates for expenditure upon them, would certainly not be allowed to suffer.

4. *River transport.* – The chartering of vessels direct from England would greatly reduce river freights. The possibility of this depends upon having plenty of notice to order material, and take advantage of high water. This would effect a great saving. In the estimate for £1,600 per mile, £180 is included for freights. 

F.D.L.

July 22, 1906.

SOME FEATURES
OF THE
WEST AFRICAN GOVERNMENT RAILWAYS.

BY

FREDERIC SHELFORD, B.Sc., M. Inst. C.E.

[...] By permission of the Council.
Excerpt Minutes of The Institution of Civil Engineers.

[...]
The railway systems which form the subject of this Paper are those of Sierra Leone, the Gold Coast Colony, Northern Nigeria and Southern Nigeria.[...]

Sierra Leone, which, together with the much larger Protectorate in the hinterland, extends over an area of 34,000 square miles, was the first to initiate railway construction in British West Africa. In 1893 the late Mr. (afterwards Sir) Williams Shelford, M. Inst. C.E., dispatched a survey party to examine the country, in order to report to the Crown Agents for the colonies upon the best route for the construction of a railway. Eventually it was decided to build one from Freetown, the capital, to Songo Town; and this line was extended tentatively, section by section, to Rotifunk, Mano, Mattru, Bo, and Baiima, and finally to Pendembu, which is 230 miles from Freetown, and within a few miles of the Liberian frontier. The construction of the first section was begun in 1896, and Baiima was reached in 1904, the work having been impeded by a serious native insurrection towards the end of 1898. The gauge adopted was 2 feet 6 inches. A short mountain railway has also been constructed from Freetown, to enable resi-
dents to sleep at an altitude of 800 feet above the sea, and away from the more unhealthy business centre of the town. This line was completed in 1904. The gauge is the same as the main line, namely, 2 feet 6 inches, but the gradients are as steep as 1 in 22. It is worked adhesively, and used mostly for passenger-traffic. / 

Railway construction upon the Gold Coast was the outcome of the working of the gold mines at Tarkwa, which demanded some means of mechanical transport. Before the advent of the railway the heavy machinery essential to gold-mining could only be conveyed to the mines in sections, at a cost of anything up to £40 per ton. In 1897, therefore, a survey was made from the coast to Tarkwa, a distance of 40 miles, and the then almost unknown place Secondee was selected as the coast terminus. There are no natural harbours on the Gold Coast, and Secondee was really a choice between evils. In 1898 construction was begun. The difficulties encountered were very great: much material was lost in landing at Secondee; the climate was very bad, and rainfall was very heavy; the entire route of the railway was covered by an exceedingly dense tropical forest; the ground was swampy, and ballast was not found in any quantity; while the gold-mining companies were sending up large quantities of machinery and stores to rail-head. Further, there was a formidable rising of the Ashanti tribe in 1901, and the country was generally in a disturbed condition. The gauge adopted was 3 feet 6 inches, with gradients of 1 in 50, compensated, and 5-chain curves, in spite of which the work was fairly heavy.

During 1898 the question arose of extending the Secondee-Tarkwa Railway to Coomassie, or, alternatively, of constructing another line from Accra, the capital of the colony, which is situated about 180 miles east of Secondee. A reconnaissance survey of the Accra-Coomassie line had been made in the year 1897, and the route had been found to be feasible; but nothing whatever was known of the country between Tarkwa and Coomassie, which was entirely covered by dense tropical forest, threaded by a few hunters’ tracks, and it was thought that the Adansi Hills might form an obstruction. In 1899 the Author undertook to go over both routes and compare them, and as the result of his report, it was decided to extend the Secondee – Tarkwa line to Coomassie, this route traversing the whole range of the Tarkwa main reef, and serving, in particular, the extensive concession of the Ashanti Goldfields Corporation and other mining-properties. The railway reached Coomassie in September 1903. Its length is 168 miles. A branch of the main line from Tarkwa to Prestea (20 miles) is now also completed. A railway between Accra and Mangoasi (40 miles), at the eastern end of the colony, was begun, under contract, in 1909, and is now completed. It is proposed to extend this line to Coomassie, a distance of about 100 miles by the eastern route.

Southern Nigeria, which has a large and industrious population and great wealth of natural products, has proved to be one of the / most important of the
Crown Colonies. Extensive reconnaissance surveys for railways to develop the country were made in 1894–5, and comparative estimates of cost and of probable traffic were made for various alternative schemes, upon which a report was made by Mr. William Shelford. As a result, a railway was authorized for 22 miles, from Lagos to Otta. In subsequent years extensions were further authorized from Otta to Abeokuta (with a population of more than 100,000), thence to Ibadan (150,000), thence to Oshogbo, and on to Ilorin, the Niger River, and thence to Zungeru, the capital of Northern Nigeria, about 420 miles from Lagos. At Zungeru the Lagos Railway joins the Northern Nigerian Railway, and as such continues to Zaria and Kano, about 700 miles from Lagos: it has thus become an important trunk line. A peculiarity about it is that it starts from the Island of Iddo, situated on the Lagos Lagoon. A road bridge connects Lagos Island, upon which the town of Lagos stands, with the railway terminus at Iddo. Twin road and railway bridges connect Iddo with the mainland, upon which is the principal railway depot, Ebute Metta. The gauge adopted is 3 feet 6 inches, and originally the gradients were 1 in 50 with 10-chain curves. In the upper section of the line gradients of 1 in 80 with exports, and 1 in 100 against exports, with 15-chain curves, were adopted. The railway reached Otta in 1897, Abeokuta in 1899, and Ibadan in 1900. There was then a pause of 4 years until 1904, when the line was continued from Ibadan, reaching Oshogbo in 1907, Ilorin in 1908, and the Niger River in 1909. The bridge over the Niger River is under construction, and the extension north of the river is approaching completion. The Lagos Railway passes through exceedingly fertile country as far as Oshogbo, and serves the native towns mentioned above and others near the railway route, many of which have populations of 30,000 and upwards.

Northern Nigeria was taken over from the Royal Niger Company on the 1st January, 1900. Its area is about 255,000 square miles, or one-and-a-quarter times that of France. In 1902 a short length of 12 miles of 2-foot 6-inch gauge tramway was laid to connect the site of Zungeru, the capital, with the Kaduna River, and this was extended to 22 miles. It was not, however, until 1907, upon the appointment of Sir Percy Girouard, K.C.M.G., as High Commissioner, that financial arrangements were made whereby money was advanced by Southern Nigeria to enable a railway to be built from Baro, upon the Niger River, to Zungeru, Zaria and Kano. This line is now approaching completion. Numerous surveys have been made from time to time for other lines of railway, but up to the present these have not been authorized.

Before passing to the technical features of the West African Government railways it will be of interest to mention that, since the completion of these railways, the natives, who in some districts were formerly frequently engaged in inter-tribal warfare, have settled down for the most part as peaceful traders or agriculturists, while a certain number of them have learned to fill all subordinate
posts upon the railways, from navvy and ganger to clerk and station-master. The railways have, in fact, brought about the complete pacification of these colonies, previously so subject to disturbance.

The financial benefit to the colonies is best shown by the growth of trade and revenue, which must be attributed to a large extent to the development of the colonies by railways.

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* Railway opened 1899.
† Railway opened 1903.

**Surveying.**

The surveying of the railways in West Africa was rendered difficult by the very dense forest which exists from the coast for a distance of about 150 miles towards the interior, covering the whole of the routes of the Sierra Leone and Gold Coast railways, and a part of the Lagos Railway. Northern Nigeria is comparatively open country. /

The height and density of the bush varies, but generally speaking it is rare to obtain a view of a hundred yards. This forest, and the scarcity of paths through it, render it difficult to locate a line, and almost impossible to ascertain whether the line found is the best obtainable, without spending excessive time and money upon the work. The result is that sometimes, after the line has been built and the bush cleared for agriculture or other purposes, it is discovered that certain curves or gradients might have been ameliorated or avoided. In difficult country, under such circumstances, the best line that can be found within reasonable time must be adopted, and deviations, if necessary, left until a later date.

Reconnaissance surveys are particularly difficult in the West African forests. The Author has dealt in a previous Paper† with the subject of railway-surveying in tropical forests, and it is only necessary to add a few remarks from more recent experience. For preliminary traversing the ‘miner’s dial’ has been more appreciated, standing rough usage well, and being more rapid in action than a prismatic compass, although perhaps slightly less accurate. Steel bands instead of

chains have the advantages of not stretching and of not catching in the vegetation. Aneroids\(^1\) are particularly useful in the tropics, as the atmospheric pressure remains remarkably uniform except before and after tornadoes. Tachometers\(^2\) have also proved useful for taking long cross sections, saving the operator from traveling along the cross cut. They are also preferred by some of the engineers for main survey work. In open country, beyond the forest belt, the tacheometer is, of course, invaluable. A theodolite required for astronomical work should have the spirit-level for the vertical are placed upon the frame of the instrument and not upon the are itself. It should also be fitted with diagonal eye-piece and coloured glasses. An artificial horizon should be so made that the mercury very nearly fills the trough, otherwise it may be impossible to observe a star of low altitude.

A full chronometer\(^3\) cannot be carried long distances across country, as, even if the instrument be not broken altogether, its rate is certain to be affected. Half chronometers in watch form appear to be more reliable for inland work. Perambulator-wheels are very useful in reconnaissance work. The type usually offered, however, is imperfect and apt to become useless after being run a short distance, owing to wear and clogging with dirt. A type designed and used by the Author consists of a strong iron wheel with a plain iron rim, and is fitted with a form of bicycle-cyclometer. Such perambulators have been run for hundreds of miles without failure.

The methods of survey employed have been very numerous, depending mainly upon the fancy of the engineer engaged upon the work. Every possible method and form of survey has been used, from the roughest to the most refined. As a type of rough survey may be mentioned that of stepping distance and judging direction by shouting, a method which has given approximate results of value.

Between such a method and an accurate theodolite and spirit-level survey there are many gradations. The general principle, however, is the same in all cases, namely, to obtain a base-line by running a traverse and levels, from which a railway-line may be located by approximation.

In the course of reconnaissance surveying, information is usually required as to the names and positions of villages, the number of inhabitants, their occupations, the market for their goods, the direction of the local trade, the nature of the forest, and the probable amount of forest products, so that the railway may be run through the most profitable country; while notes as to the nature of the soil, size and direction of flow of rivers, and occurrence of ballast and water, are also required for the purpose of estimating the cost of construction. In order to carry out these duties effectively, the engineer in charge needs to possess considerable knowledge not only of surveying but also of botany, geology, and mineralogy; while his interest in his work is much increased by some knowledge
of ethnology, entomology, zoology, and other branches of natural science. Bushcraft, which is quite a science in itself, is sometimes very useful.

The study of native customs, land-tenure, folk-lore, and native administration, may be added as a pleasant and instructive pastime. Native languages in West Africa, where they are very numerous, are rather beyond the powers of Europeans unless long resident in the same district.

The units of measurement employed are usually left to the resident engineer, and in most cases the 66-foot chain and curvature expressed in chains of radius are preferred. In some instances, however, the degree curve and the 100-foot chain both been adopted. The degree curve has many advantages, but the 100-foot chain has the great disadvantage of not fitting in with the statute mile — a unit which it is difficult to eradicate from the British mind. The metric system has not been adopted for the same reason.

In location work contoured plans are prepared and the gradients are suited to the ground with due compensation for curvature. / Easement curves are also introduced, and it is essential that these should be taken into account during the survey, as they cannot be put in afterwards. Vertical curves are also employed.

The permanent marking of a surveyed line is difficult in most tropical countries, as a line cut through the bush is overgrown in a few months, and wooden pegs are apt to sprout into trees. Iron pegs are difficult to transport. In some cases where it has been necessary to mark a line on the ground with sufficient permanence to last for a few years, concrete blocks sunk level with the ground have been used, with the station marked upon them by cuts, the block itself being marked by a gas-tube embedded in the block and carrying a number stamped on a plate. The transport of the materials for such a system and the labour involved generally render the cost of such permanent marks prohibitive.

Clearing.

In order to render a line of railway through a dense tropical forest safe from interruption by fallen trees it is essential to cut down all trees which in falling would reach the railway or the telegraph-wires. When, therefore, the trees reach a height of 150 feet, as is not uncommon, it is necessary to cut a roadway 300 feet wide in addition to the width of the railway. This involves clearing about 40 acres per mile of line, and becomes a very serious matter when there are as many as twenty really large trees to the acre, as well as undergrowth. In such a case there would be about 80,000 trees to be cut in 100 miles of railway. Some of the trees met with in the West African forests are very large, measuring 20 to 30 feet in circumference at the base and being furnished with large buttresses. Such a tree will take 2 to 3 days to cut down by hand. Tree-felling machinery has not been employed extensively, as the native labourers are more efficient and reliable. Various devices have been adopted after the opening of a railway, whereby, by
means of blocks and tackle, some trees have been pulled down by a locomotive. Here again, however, there is difficulty in fixing the apparatus and in attaching it to the top of the tree.

The tree when felled is by no means disposed of. It has to be cut into sections and rolled aside. The very large mass of small branches, as well as the undergrowth, has to be cut up, dried, and burnt. The stump of the tree also causes difficulty. It has to be dug round, the roots have to be cut, and the stump must be dragged out and hauled aside, unless its position is such that it can be allowed to remain. Clearing entails, therefore, a considerable addition to the cost of the work.

The maintenance of the clearing also adds to the working-expenses. Owing to the hot moist atmosphere the undergrowth grows very quickly and requires cutting back about every 6 months. The trees also are sure to give trouble if, from considerations of expense, the clearing has been made of insufficient width. The effect of cutting a broad line through the forest is to let light into dark places, and the trees along the side of the clearing draw towards the light, the branches growing inwards so that the tree is more inclined to fall towards the railway in a high wind. The Gold Coast Government Railway has suffered since its opening from the falling, on an average, of more than two hundred trees per annum. Steps have been taken recently to widen the clearing, but the number of falling trees does not as yet show any sensible decrease. Trees of value are unfortunately rare, so that letting out timber-concessions has not proved a means of alleviating this trouble.

**West African Forest.**

The area covered by forest in West Africa is so vast, and the quantity of timber is so prodigious, that passing reference may be made to the nature of the forest met with. The Gold Coast Railway is perhaps the most interesting in this respect.

Shortly after leaving the coast the railway plunges into ‘tropical rain forest’ (Schimper), which is a lofty and luxuriant evergreen forest. This forest includes trees of giant growth, amongst which are mahogany (*Khaya*), ceder (*Pseudocedrela*), Odoum or Iroko of Southern Nigeria (*Chlorophora*), Waw-Waw, Offram (*Terminalia superba*), and the silk-cotton trees *Eriodendron* and *Bombax*. These trees are mostly buttressed to a considerable height. The rest of the forest consists of smaller trees, many of which have not been identified. There are also a number of oil-palms (*Elaeis Guineensis*), and the beauty of the forest is much enhanced by the woody lianas which stretch from tree to tree. The mahoganies, cedars, Odoum, Baku, and other trees are exported to Europe; others again are used locally for mine-props and other purposes. The *Elaeis Guineensis* or oil-palm is the source of the commercial ‘palm oil.’ The rubber-producing plants *Funtumia*
elastica and Landolphia are found in the forest, while various fibre-producers also occur.

Farther inland, as the railway approaches the Offin River, dividing the Gold Coast from Ashanti, the forest becomes more of a mixed deciduous type, containing most of the types found in the rain-forest, together with a large number of smaller trees, many of which have not been identified. In this class of forest there occur the mahogany, cedar, Odoum, ebony, Waw-Waw and Emril, with Funtumia and Landolphia, and Raphia and other fibres.

Beyond the deciduous forest is found the savanna forest, a park-like formation common in many parts of tropical Africa and America.

Earthworks.

When the railways in West Africa were first mooted there was a cry for ‘surface’ railways, and there is no doubt that the construction of the West African railways was in the first instance affected to some extent by this popular idea, which had obtained a hold upon the minds of the authorities of the time. However, the physical features of the country in most parts of West Africa prohibited the adoption of real surface lines, and the earthworks required upon most of the railways proved to be heavy.

No costly plant was used upon the earthworks of the West African railways. ‘Overland routes’ were rarely practicable because of the forest. Cuttings were not tipped to bank but to spoil. Banks were built from borrow-pits, which were usually extended over large areas on account of the tree-stumps to be avoided. They require to be drained to avoid the formation of stagnant and mosquito-breeding pools.

The main difficulty with banks in the tropics is that, whereas they ought to be permitted to stand through a wet season before ballast or permanent way is carried over them, it is impossible in ‘telescopic’ railway construction to allow the time for this, as supplies must be carried over the completed line. The result is that ballast is thrown upon a green bank and much of it is lost; or permanent way is laid over the bank and is damaged thereby. It is hoped that the discussion upon this Paper may throw some light upon the difficulty as solved, possibly, elsewhere.

Cuttings were taken out by native labour with picks, hoes, and baskets, and carried to spoil. The slopes of cuttings were frequently left vertical when the material was suitable, the rain, which is torrential, often doing less harm to a vertical face protected by vegetation than to a sloped face. Rock-cutting is usually bored by hand-drills, machine drills being less economical than hand-labour owing to the supervision required.

The earthwork in most cases is done by ‘petty contract,’ a group of natives of one tribe or of one family taking a few chains, for which they are paid upon
The prices paid depend on the height of the bank or the depth of the cutting, and on the material. This system has proved satisfactory, both to the Governments concerned and to the natives, who quickly learn to appreciate its advantages.

The number of natives engaged upon the earthworks has at times been large: for instance, the Sierra Leone Railway at one time employed more than 4,000, the Gold Coast Railway, 16,000, and the Lagos Railway, 19,000. In the case of the Gold Coast Railway, where the country was sparsely populated, arrangements were made for importing about 40,000 labourers partly from Sierra Leone, but mostly from Southern Nigeria, all upon 12-months agreements. Food-supplies were shipped monthly from Liverpool to provision the labour engaged upon the work.

At no time has there been serious trouble with the natives engaged upon any of the works. They have been for the most part very glad to supplement their ordinary means of subsistence by earning money upon railway construction. Recruiting has been done by the various District Commissioners, and almost all the natives, once realizing that they would be paid regularly and in full, have made good workmen. When, at a later date, the railways have been opened, all subordinate posts have been readily filled with natives of the colony; the unskilled posts have gone to the uneducated natives, while posts in the clerical, traffic, management, and telegraphic departments have gone to the educated class of natives, which is becoming increasingly numerous.

All the railways in West Africa, forming as they do by far the best footpaths in the country, suffer from trespassers, who march along the railways, at some danger to themselves, and damage the cress of the banks. Low transport-rates seem to be the only efficient check to this abuse of the railways.

Pipes and Culverts.

For small drains, earthenware pipes would be the most convenient for construction, but high shipping-freights and considerable breakage in transport make their employment costly. To overcome the difficulty, pressed-steel culvert-pipes 18 inches to 4 feet in diameter have been largely used. These have head-walls, but no concrete reinforcement. Corrugated iron pipes have also been used 2 feet to 6 feet in diameter. These are easily carried in sections as head-loads to the site of the work, but their employment has been confined either to pioneer lines for use under small / banks, where they would be readily accessible for repairs, or in conjunction with concrete reinforcement.

The usual arched and open culverts have been used from 2 feet to 20 feet in span, and do not require special reference in this Paper.

For some of the smaller culverts steel centering has been employed successfully, enabling concrete culverts to be constructed in place of earthenware pipes.
Concrete has been generally used instead of masonry in all culvert work, on account of the absence in many places of suitable stone and the general lack of skilled masons.

**Bridges.**

The railways in British West Africa aggregating about 1,300 miles, bridges are naturally very numerous, and it is impossible within reasonable limits to describe in detail either their construction or the methods of their erection. A list of some of the more important bridges is given in Appendix I.

Generally speaking, the bridges are of utilitarian design and devoid of any attempt at decoration, but in some of the larger bridges the simple lines of steel-work with plain piers and arched approaches have produced quite artistic effects. Most of the steel spans are of the deck type, except where the want of headway called for a half-through type.

The first steel viaducts were erected by means of a traveling overhanging gantry crane, but this was found unnecessary and was abandoned. Falsework has been rarely used, except in some of the smaller spans where sleeper cribs were employed.

The 170-foot spans of the Sewa and Moa bridges (Sierra Leone) were built out from the two ends. Adjusting-wedges worked by screw-gear were placed at the bottom of each end-post for the purpose of raising or lowering the meeting ends before finally bolting up. The strains were calculated for these girders accordingly.

The 180-foot span of the Ancobra bridge (Gold Coast) was erected cantilever fashion, the side spans acting as anchorages.

All steelwork was sent out in riveted sections, all field connection being made by turned bolts.

The bridges upon the Lagos Railway or in connection therewith are of considerable importance. In addition to the railway-bridges there are the following bridges connecting the Island of Lagos with the mainland. /

*Carter Road-Bridge.* – The Carter bridge which crosses the Lagoon from Lagos to Iddo Island is 2,104 feet in length, and is provided with a swinging span giving a clear opening of 50 feet for navigation.

From the Lagos shore the first thirteen piers (twelve of which are in deep water) consist of four piles each completely braced in both directions. The twelve spans of lattice girders between these piers are each 71 feet 6 inches long, and the piers are 90 feet apart from centre to centre. The swing is situated between the thirteenth and fourteenth piers and is supported on a special pier. Between the swing span and Iddo Island there is shallow water, and the bridge consists of fifteen 50-foot lattice spans supported on piers of two piles braced transversely,
but piers of four piles braced both ways are provided every fourth and third span alternately.

The Lagos steam-tramway, of 2-foot 6-inch gauge, from Lagos to Iddo station, runs over this bridge.

_Denton Bridges._ – The two Denton bridges connect Iddo Island with the mainland; they are 917 feet long and run side by side 21 feet 6 inches apart between centres; the railway-bridge consists of seventeen 50-foot spans of plate girders, and the road-bridge consists of seventeen 50-foot spans of lattice girders; both bridges have trough flooring. The piers are similar to the piers on the Carter bridge between the swing span and Iddo Island.

_Erection of the Carter and Denton Bridges._ – The piles were screwed (in some cases to a maximum depth of 87 feet) by means of a specially constructed screwing-pontoon 60 feet long, and 25 feet in beam, with a draught not exceeding 3 feet. This was fitted with hydraulic pumps, engine, boiler, steam-winching gear, 5 booms, anchor winches, etc. The hydraulic pumps were connected, by flexible hydraulic tubing, with a capstan on the pile.

The main girders were put together in the shops and carried into position by a specially designed twin lighter, the two hulls of which were 50 feet long, 12 feet wide, and 6 feet deep, and were propelled by screws; the lighter was fitted with an upper deck, 26 feet by 25 feet, which, by means of steam-driven screws, could be raised or lowered a distance of 8 feet. The flooring, in lengths of 25 feet, was also put together in the shops and brought on the lighter.

At Jebba, on the Niger River, temporary transport across the river has been provided by a steam wagon-ferry with slipways on each bank. At the same time considerable progress has been made upon both the northern and the southern sections of the Niger bridge. These works form an undertaking of considerable magnitude, and the Author hopes to be able to present another Paper on the subject at a later date.

**STATIONS.**

The stations on all the West African railways are of a simple country type. There are no platforms, and usually only a loop siding for passing trains, with a second loop or dead-end siding for local traffic. The terminal stations, however, are more pretentious.

The earlier station-buildings were of timber and corrugated sheeting, owing to the absence in some cases of stone and bricks and the general lack of masons and bricklayers. These buildings could be framed and put together at home, and were thus readily re-erected in the Colonies, even by unskilled labour. The buildings intended for European quarters were usually placed upon stone or concrete pillars, to keep them out of the damp and to ward off attacks from white ants.
The terminal station of the Sierra Leone Railway has a building of moderate proportions, constructed of stone blockwork with ashlar quoins. This was the first station-building constructed in stonework in the West African colonies.

The station-building at the terminus of the Gold Coast Railway (Secondee – Coomassie line) is a building of some pretentions. The walls are constructed of rubble masonry, with timber roof-trusses, and the roof-covering is of corrugated sheeting. It is a two-story building, 250 feet in length, with a large central hall, booking-office, station-master’s room, telegraph-office, two parcel-offices, waiting-room and station stores above.

At Accra the station-building is more advanced and are all of concrete, with roofs of “eternit” slates. The main station-building is of some architectural merit, being a single-story building with large overhanging eaves and with the valance-boards coming down to within 8 feet of the ground, thus affording ample shade for the offices within.

It has a spacious waiting-hall and is surmounted with a turret with a large four-faced clock. Both the roof and the sides of the turret are covered with eternity slates of a dull red colour.

Wayside stations have buildings of simple design, sometimes in one floor, sometimes in two, carried out in the majority of cases in timber.

Concrete buildings with flat roofs of a more or less oriental type have been built in some cases and are cool and effective. Such a building has recently been erected for the station at Jebba, and one will shortly replace the existing timber building at Ibadan. Lagos has no important station-building, but both at Ebute Metta and at Offa on the Lagos Railway some very extensive workshops have been constructed.

The general quarters, running-sheds, and construction-workshops at Secondee were all built of corrugated sheeting on timber or iron framing, but at Lagos the new shops have been constructed of concrete and roofed with Welsh slates, and several of the existing timber buildings were extended in similar material.

Among the buildings recently constructed at Ebute Metta was a carriage and wagon repair-shop, 300 feet long and 70 feet wide, and a locomotive sub-store 200 feet long and 30 feet wide, both in concrete with Welsh slated roofs.

As it is important in a tropical climate to obtain sufficient light in the buildings without the direct rays of the sun, all the buildings where possible, such as the engine running-sheds, carriage-sheds, and paint-shops, have been constructed with saw-tooth roofs.

Small coal-stores have been constructed at intervals along the railways, and at Ebute Metta a coal-store to accommodate 1,000 tons was built. The lower portion, up to a height of 9 feet, is constructed of concrete, and the roof, which has a span of 48 feet, is carried on steel trusses. Two high-level tracks run down the
whole length of the building, so that full wagons may be shunted in and quickly unloaded. Narrow-gauge tracks also run on the same level; these carry ½-ton skips, which are propelled by hand and from which the coal is tipped direct into the tender or coal-bunkers of the engines, each skip being automatically weighed and registered. A similar building is now in course of construction at Offa.

The officials’ quarters have mostly been constructed in timber and corrugated sheeting, but these again are giving way to concrete buildings with roofs of Welsh or ‘eternit’ slates. The main feature of these buildings is the wide verandas with overhanging roofs, many of them 9 and 10 feet wide. The doors and windows in many cases are fitted with inner frames filled with mosquito gauze, thus enabling the outer doors, when the weather permits, to remain open after sunset. Several quarters have the whole of the veranda mosquito-proofed by filling in with gauze from the floor to the fascia-board, a double entrance-door being provided, so that the outer door may be closed before the inner door is opened.

The water-tanks at wayside stations are generally of cast iron, having a capacity of 2,000 to 15,000 gallons, and are carried on steel framework varying in height up to 28 feet. At Ebute Metta a larger tank of 40,000 gallons capacity is now in course of erection. / This also is of cast iron and will stand on steel trestlework 60 feet high.

Owing to the lack of a permanent natural supply of water, a storage-tank was constructed at Accra, having a capacity of 72,000 gallons. It is a circular tank 36 feet in inside diameter, constructed of plain concrete sides and bottom, with a reinforced-concrete top. It is built below ground-level and takes the whole of the catchment from the station-buildings.

At most of the wayside stations the water-supply is dependent on the wells which have been sunk, but where a natural supply has been available only for certain periods of the year a reservoir has been constructed, to enable a supply to be provided during the dry season also.

PERMANENT WAY.
On all the West African railways steel rails weighing 28 lbs. to 55 lbs. per lineal yard, keyed with steel keys to steel sleepers, are in use. Earth ballast has been used where stone was not procurable, and the first 60 miles of the Lagos Railway ran for some years with earth ballast only. Native timber sleepers have not been successfully used, but creosoted Baltic sleepers have a fair life.

SIGNALLING.
The electric-staff system is installed on all the West African railways, the trains being flagged into the station. The first train in takes the platform-road. The switches outside stations are locked with a point-indicator. Night running has been unnecessary so far, but the increase of traffic will compel it upon the Lagos
Railway, and steps are being taken to install an interlocked semaphore system. One objection to night running in the forest belt is the danger from falling trees.

ROLLING STOCK.
The rolling stock of all the railways has been built to meet the requirements of the time, and with the growth of the traffic the locomotives have increased in size while the passenger-coaches have improved in comfort.

The Sierra Leone 2-foot 6-inch gauge railway has been worked for many years with six-coupled tank-engines having cylinders 10 inches by 15 inches and 10¾ inches by 15 inches, Walschaert valve-gear, driving-wheels 28 inches in diameter, boiler-pressure / 160 lbs. per square inch, grate-area 6·25 square feet, heating-surface 312 and 381 square feet, screw reversing-gear, underhung laminated springs, steam and hand-brakes, ’W.A.G.R.’ draw-gear, and a pony truck9 at each end, their weights in working order being 18·5 and 20·1 tons.

Of the more recently-introduced types one is an eight-coupled tank 2 – 8 – 0 engine, having cylinders 12 inches by 16 inches, driving-wheels 28 inches in diameter, grate-area 10·9 square feet, and heating-surface 495 square feet, the weight in working order being 23 tons 8 cwt. The latest is a 4 – 8 – 0 tender locomotive with six-wheeled tender, cylinders 13 inches by 16 inches, coupled wheels 28 inches in diameter, grate-area 12 square feet, and heating-surface 724 square feet, the weight in working order being 22 tons for the engine and 10·9 tons for the tender.

The Lagos and Gold Coast locomotives, 3-foot 6-inch gauge, are similar, and include:–

Six-coupled tank shunting-engines:
Cylinders, 13 inches by 18 inches; driving-wheels, 39½ inches in diameter; grate-area, 9·2 square feet; heating-surface, 531 square feet. Weight, in working order, 27 tons.

Cylinders, 14 inches by 18 inches; driving-wheels, 40½ inches in diameter; grate-area, 11½ square feet; heating-surface, 723 square feet. Total weight, in working order, 38·65 tons.

2 – 6 – 0 tender-engines (Gold Coast Railway):
Cylinders, 14 inches by 18 inches; grate-area, 11½ square feet; heating-surface, 723 square feet. Weight, in working order, 38·7 tons.

2 – 6 – 0 tender-engines:
Cylinders, 14 inches by 18 inches; driving-wheels, 39½ inches in diameter; grate-area, 12 square feet; heating-surface, 703 square feet. Weight, in working order: engine, 26 tons; tender, 18 tons; total, 44 tons.

2 – 6 – 0 tender-engines:
Cylinders, 15 inches by 20 inches; driving-wheels, 40 inches in diameter;
grate-area, 14 square feet; heating-surface, 987 square feet. Weight, in working order: engine, 33 tons; tender, 22 tons; total, 55 tons.

2 – 6 – 2 passenger-engines (Lagos only):
Cylinders, 15 inches by 20 inches; driving-wheels, 48 inches in diameter;
grate-area, 14 square feet; heating-surface, 989 square feet. Weight, in working order: engine, 39 tons; tender, 23 tons; total, 62 tons.

2 – 8 – 0 mixed-traffic engines:
Cylinders, 17 inches by 21 inches; driving-wheels, 40 inches in diameter;
grate-area, 16¼ to 17¾ square feet; heating-surface, 1,001 to 1,287 square feet. Weight, in working order: engine, 39 to 43 tons; tender, 22 tons; total, 61 to 65 tons.

4 – 8 – 0 tender-engines (Gold Coast Railway):
Cylinders, 17 inches by 21 inches; driving-wheels, 40½ inches in diameter;
grate-area, 16¼ square feet; heating-surface, 1,061 square feet. Weight, in working order: engine, 42 tons; tender, 25 tons; total, 67 tons.

4 – 8 – 0 tender-engines (Lagos Railway):
Cylinders, 17 inches by 23 inches; driving-wheels, 42¾ inches in diameter;
grate-area, 17½ square feet; heating-surface, 1,088 square feet. Weight, in working order: engine, 48 tons; tender, 25 tons; total, 73 tons. The latest engines of this type have been fitted with Schmidt superheaters.

The ‘W.A.G.R.’ coupler is a unique type of tight centre coupling, and has been used successfully for many years. It is now, however, giving way on the Lagos Railway to the ‘A.B.C.’ automatic coupler, which was first introduced by the Author on the Cyprus Railway.

GOODS STOCK.
There is a very large variety of rolling stock upon the West African railways, but most of it is bogie stock with pressed steel underframes. There is practically no four-wheeled stock. The Gold Coast Railway has some rolling stock with timber framing, which was used on account of the necessity for floating the underframes to shore. The Lagos Railway for some time favoured built-up steel frames as being more readily repaired after accident.

Chilled cast-iron wheels are in use on the Sierra Leone Railway and on the Gold Coast railways. At Lagos they have been abandoned in favour of steel-tired wheels with spoked or pressed steel centres.

The brakes have been hand-brakes worked at either end by wheel and ratchet. Vacuum brakes are being introduced on the Lagos Railway.

CARRIAGE STOCK.
The stock under this head is not very numerous, but from the commencement it has been of the end-door corridor type, with the brake-wheel on the platform.
Seats are placed corridor fashion and are of cane or upholstered. Third-class carriages are usually fitted with benches only. For the use of colonial and railway officials there is a preference for cars consisting of an almost empty shell fitted with canvas deck-chairs.

Kitchen-cars, and cars fitted with sleeping-berths, baths and other luxuries, are to be found.

The cars are fitted with sunshades, the roofs being covered with canvas and painted with white lead. They are lighted by paraffin-oil lamps, but lamps are not much in use. Electric light is being tried, and experimental sets of the Stone and Leitner systems have been sent out.

Teak for the outside finish is favoured, but many varieties of inside finish have been tried. The windows are fitted with louvers, sometimes also with glass.

Various systems of lavatory arrangements have been tried.

It is impossible to deal in a reasonable space with all these matters, but it is hoped that some discussion may be raised by the foregoing remarks.

For inspection purposes, push-trollies, ‘pump-cars,’ and motor inspection cars have been used.

**COST OF CONSTRUCTION, AND RESULTS OF WORKING.**

The Sierra Leone Government Railway, 2 feet 6 inches gauge, has a total length, with branches, of 255 miles. The total cost amounted to £1,020,120, and the results of working have been as follows:–

<table>
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<tr>
<th>Year</th>
<th>1905</th>
<th>1906</th>
<th>1907</th>
<th>1908</th>
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<tr>
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<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
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<tr>
<td>Gross earnings.</td>
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<td>62,000</td>
<td>75,000</td>
<td>71,000</td>
<td>84,000</td>
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<tr>
<td>Working expenses.</td>
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<td>53,000</td>
<td>63,000</td>
<td>65,000</td>
<td>69,000</td>
</tr>
<tr>
<td>Net receipts.</td>
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<td>9,000</td>
<td>12,000</td>
<td>6,000</td>
<td>15,000</td>
</tr>
</tbody>
</table>

The Gold Coast Government Railway, 3 feet 6 inches gauge, has a total length of 168 miles, with a branch of 19 miles. The total cost amounted to £1,756,000, and the results of working have been as follows:–

<table>
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<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td>Gross earnings.</td>
<td>133,000</td>
<td>171,000</td>
<td>166,000</td>
<td>151,000</td>
<td>185,000</td>
</tr>
<tr>
<td>Working expenses.</td>
<td>82,000</td>
<td>77,000</td>
<td>77,000</td>
<td>75,000</td>
<td>74,000</td>
</tr>
<tr>
<td>Net receipts.</td>
<td>51,000</td>
<td>94,000</td>
<td>89,000</td>
<td>76,000</td>
<td>111,000</td>
</tr>
</tbody>
</table>

The Lagos Government Railway, 3 feet 6 inches gauge, has a length, to the Niger River only, of 308 miles. The total cost amounted to £2,007,000, and the results of working have been as follows:–

<table>
<thead>
<tr>
<th>Year</th>
<th>1905</th>
<th>1906</th>
<th>1907</th>
<th>1908</th>
<th>1909</th>
</tr>
</thead>
<tbody>
<tr>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td>Gross earnings.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working expenses.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net receipts.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1905</td>
<td>1906</td>
<td>1907</td>
<td>1908</td>
<td>1909</td>
</tr>
<tr>
<td>----------------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Mean mileage worked</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td></td>
<td>125</td>
<td>131</td>
<td>178</td>
<td>214</td>
<td>272</td>
</tr>
<tr>
<td>Gross earnings</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td></td>
<td>73,000</td>
<td>85,000</td>
<td>140,000</td>
<td>146,000</td>
<td>204,000</td>
</tr>
<tr>
<td>Working expenses</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td></td>
<td>57,000</td>
<td>60,000</td>
<td>74,000</td>
<td>103,000</td>
<td>132,000</td>
</tr>
<tr>
<td>Net receipts</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td></td>
<td>16,000</td>
<td>25,000</td>
<td>66,000</td>
<td>43,000</td>
<td>72,000</td>
</tr>
</tbody>
</table>

In all these colonies a large increase in the trade of the colony and in the customs receipts has resulted from the construction of the railways.

RAILWAYS IN FOREIGN WEST AFRICA.

It may be of interest to note that France has been very active in railway construction during the last 20 years. The principal French railways are:

- Dakar – St. Louis Railway, 165 miles in length, reported to have cost about £5,200 per mile.
- Kayes – Koulikoro Railway, 345 miles in length, reported to have cost £5,750 per mile.
- Thies – Kayes Railway, not yet completed, but will have a length of 370 miles.
- Konakri-Couroussa Railway, 365 miles in length, stated to have cost £2,380,000 (£6,525 per mile).
- Ivory Coast Railway, in course of construction, the first section to be 195 miles in length.
- Dahomey Railway, now built to Savé, a distance of 160 miles.

APPENDIX.

RAILWAY BRIDGES ON THE WEST AFRICAN GOVERNMENT RAILWAYS.

Sierra Leone.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>78</td>
<td>Nichol Brook.</td>
<td>9</td>
<td>20&amp;40</td>
<td>281</td>
<td>44 {Plate girders on concrete piers.}</td>
</tr>
<tr>
<td>4</td>
<td>75</td>
<td>Kissey Brook.</td>
<td>6</td>
<td>18&amp;32</td>
<td>280</td>
<td>80 {Lattice girders on steel trestles.}</td>
</tr>
<tr>
<td>7</td>
<td>40</td>
<td>Wellington Brook.</td>
<td>7</td>
<td>18&amp;32</td>
<td>312</td>
<td>70 {Lattice girders on steel trestles (one concrete pier).}</td>
</tr>
<tr>
<td>7</td>
<td>77</td>
<td>Calaba Brook.</td>
<td>5</td>
<td>30</td>
<td>158</td>
<td>30 {Lattice girders on concrete piers.}</td>
</tr>
<tr>
<td>8</td>
<td>16</td>
<td>Robiss Brook.</td>
<td>4</td>
<td>18&amp;32</td>
<td>162</td>
<td>43 {Lattice girders on steel trestles (one concrete pier).}</td>
</tr>
</tbody>
</table>
11 65 Orogou Viaduct.  6  50,18&100  386  74  Lattice girders on concrete piers and steel trestles.
12 78 Maroon Viaduct.  7  18&32  330  82  Lattice girders on steel trestles.
13 50 Hastings Viaduct.  7  18&32  294  71  Lattice girders on steel trestles and two concrete Piers.
17 14 Lewis Viaduct  4  30  126  27  Plate girders on concrete piers.
18 24 Allanmangey Viaduct.  5  18&32  182  51  Lattice girders on steel trestles and concrete piers.
38 65 Ribbi Bridge.  6  60  662  47  Steel truss girders on screw piles.
79 00 Bangue Bridge.  2  66  232  33  Half through lattice on concrete piers.
106 43 Taia Bridge.  10  58  589  27  Deck plate on concrete piers.
160 50 Sewa Bridge.  2  120  718  36  Half through on concrete piers.
213 40 Moa Bridge  Mountain Railway.  3  120  633  36  Half through on concrete piers.
1 77 Congo Viaduct.  4  50  ..  37  Steel lattice girders on concrete piers.

Gold Coast.

<table>
<thead>
<tr>
<th>Mileage.</th>
<th>Name.</th>
<th>No. of Spans.</th>
<th>Length of Spans.</th>
<th>Height of Piers.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M., Chs</td>
<td>Secondee-Coomassie – Bonsa</td>
<td>2 Fr.</td>
<td>60 Pt.</td>
<td></td>
<td>36 Half through.</td>
</tr>
<tr>
<td>100</td>
<td>Offin River</td>
<td>3 Fr.</td>
<td>100 Pt.</td>
<td></td>
<td>Half through.</td>
</tr>
<tr>
<td>158</td>
<td>Orda</td>
<td>4 Fr.</td>
<td>60 Pt.</td>
<td></td>
<td>15 Half through.</td>
</tr>
<tr>
<td>Tarkwa-Prestea Branch – 9 35 Huni River</td>
<td>1 Fr.</td>
<td>150 Pt.</td>
<td>33 P f t.</td>
<td>About Half through; frame girders on concrete piers; deck plate girder on ditto.</td>
<td></td>
</tr>
<tr>
<td>17 15 Ankobra River...</td>
<td>1 Fr.</td>
<td>180 Pt.</td>
<td></td>
<td></td>
<td>Half through.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Fr.</td>
<td>90 Pt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Fr.</td>
<td>45 Pt.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Lagos.

<table>
<thead>
<tr>
<th>Mileage</th>
<th>Name</th>
<th>No. of Spans</th>
<th>Length of Spans</th>
<th>Average Height of Piers</th>
<th>Between Abutments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>67</td>
<td>Oyan</td>
<td>3</td>
<td>100</td>
<td>27</td>
<td>511 0</td>
<td>Half through girders; concrete piers.</td>
</tr>
<tr>
<td>72</td>
<td>Opeki</td>
<td>1</td>
<td>60</td>
<td>36</td>
<td>192 0</td>
<td>Half through girders; concrete piers.</td>
</tr>
<tr>
<td>93</td>
<td>Ogun</td>
<td>3</td>
<td>100</td>
<td>24</td>
<td>60 0</td>
<td>Half through girders; footway; concrete piers.</td>
</tr>
<tr>
<td>145</td>
<td>Oda Oba</td>
<td>4</td>
<td>50</td>
<td>23</td>
<td>212 6</td>
<td>Half through plate girders; concrete piers.</td>
</tr>
<tr>
<td>252</td>
<td>Ogun</td>
<td>1</td>
<td>100</td>
<td>102</td>
<td>6</td>
<td>Half through girders; concrete piers.</td>
</tr>
<tr>
<td>306</td>
<td>Jebba (South)</td>
<td>7</td>
<td>183</td>
<td>63</td>
<td>1,287 6</td>
<td>Through bridge, lattice girders with inclined end struts; first pier built in oval caisson on rock, the remaining piers on concrete walls.</td>
</tr>
<tr>
<td>307</td>
<td>Jebba (North)</td>
<td>2</td>
<td>150</td>
<td>50</td>
<td>512 0</td>
<td>Half through girders.</td>
</tr>
<tr>
<td>321</td>
<td>Ebegi</td>
<td>3</td>
<td>50</td>
<td>30</td>
<td>160 0</td>
<td>Deck plate girders on curve 3½°; concrete piers.</td>
</tr>
<tr>
<td>406</td>
<td>Igberi</td>
<td>5</td>
<td>100</td>
<td></td>
<td></td>
<td>Through spans with inclined end struts.</td>
</tr>
<tr>
<td>428</td>
<td>Kaduna</td>
<td>4</td>
<td>55</td>
<td>30</td>
<td>570 4½</td>
<td>120-foot deck spans; 55- and 40-foot plate deck; existing girders, which were designed for 2-foot 6-inch gauge, were strengthened by the addition of a new centre girder; concrete piers.</td>
</tr>
</tbody>
</table>

- **Abeokuta tramway bridge**: Carries branch railway between Aro and Abeokuta; 100-foot spans half through; 60-foot spans deck girders; footway on both sides; concrete piers.
- **Jebba (South)**: Thorough bridge, lattice girders with inclined end struts; first pier built in oval caisson on rock, the remaining piers on concrete walls.
- **Jebba (North)**: Half through girders.
- **Ebegi**: Deck plate girders on curve 3½°; concrete piers.
The Nigerian Railway. Some General Particulars, a Short Historical Sketch and Interesting Statistics (Lagos, [1925]).

NIGERIA

British West Africa

The

Nigerian Railway

Some General Particulars

a short Historical Sketch

and Interesting Statistics /

NIGERIAN RAILWAY

GENERAL PARTICULARS.

The Nigerian Railway has been constructed, and is owned and worked by the Government. It incorporates the Lagos Government Railway from Lagos to Minna, and the Baro-Kano Railway; giving an all-rail route from Lagos to Kano, 704 1/2 miles. There are, in addition, the following branch lines:

- Baro to Minna 111 miles
- Zaria to Bukuru 143 miles
- Aro to Abeokuta 1 3/4 miles
- Ifo Junction to Ifo 2 miles
- Ebute Metta to Apapa 3 3/4 miles
With the exception of the branch to Bukuru (which is 2'6"), the gauge throughout is 3'6".

2. In addition to the above, a line of 292 miles (3'6") known as the Eastern Railway runs from Port Harcourt to Makurdi on the Benue River via Enugu and the Udi Collieries. This will eventually be linked up with the Western Line at Kaduna, and, at the present time, Construction work is being carried on over the 476 miles separating the latter place from Enugu. The section between Enugu and the Benue River (Makurdi Station) was opened to Traffic on the 1st April, 1924, and it is hoped that the Section from the Benue to Kaduna will be completed by the end of 1925. From Kagora, a point on the projected Railway 108 miles from Kaduna, a branch line will run to Bukuru and Jos; thus giving direct access to the Tinfields by the 3'6" gauge. It was originally intended to build a bridge over the Benue River, but, owing to the heavy expense involved, the scheme has had to be abandoned for the time being, and trains will be ferried across.

3. A well-appointed Boat Train is run between Lagos and Zaria in connection with inward and outward mails. This train provides both sleeping and dining accommodation of an up-to-date nature. Beyond Zaria a special connecting train runs to Kano and another to Bukuru.

4. The time taken by these trains in their run from Lagos (Iddo) to the chief towns on the line is approximately as follows:

<table>
<thead>
<tr>
<th>Town</th>
<th>Distance</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oshogbo</td>
<td>182 miles</td>
<td>10 hours</td>
</tr>
<tr>
<td>Ilorin</td>
<td>243 miles</td>
<td>13 hours</td>
</tr>
<tr>
<td>Jebba</td>
<td>303 miles</td>
<td>16 hours</td>
</tr>
<tr>
<td>Zungeru</td>
<td>426 miles</td>
<td>23 hours</td>
</tr>
<tr>
<td>Minna</td>
<td>462 miles</td>
<td>25 hours</td>
</tr>
<tr>
<td>Kaduna</td>
<td>566 miles</td>
<td>33 hours</td>
</tr>
<tr>
<td>Zaria</td>
<td>617 miles</td>
<td>36 hours</td>
</tr>
<tr>
<td>Kano</td>
<td>705 miles</td>
<td>44 hours</td>
</tr>
<tr>
<td>Bukuru</td>
<td>761 miles</td>
<td>49 hours</td>
</tr>
</tbody>
</table>

5. Besides the Boat Train, there is a service of Through Trains between Iddo and Kano twice a week, the time occupied on these runs being approximately 50 hours. Sleeping and dining accommodation are provided on the Through Trains.

6. There are in addition, Local or Suburban Passenger Trains run on the different sections of the line.

7. On the Eastern line a daily service of passenger trains is maintained between Port Harcourt and Enugu; the journey being completed in 9 hours, and a daily suburban service between Port Harcourt and Aba (38 1/2 miles).

8. The passenger fares in operation per mile are:

<table>
<thead>
<tr>
<th>Class</th>
<th>Fare</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Class</td>
<td>4d.</td>
</tr>
<tr>
<td>Second Class</td>
<td>2d.</td>
</tr>
<tr>
<td>Third Class</td>
<td>3/4 d.*</td>
</tr>
</tbody>
</table>

* A special 3rd class fare of 1/2d per mile is in operation between Iddo and Lafenwa (60 miles).
9. There are also Season Ticket Rates in operation as shewn below:

<table>
<thead>
<tr>
<th>Mileage</th>
<th>1st Class</th>
<th>2nd Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 50</td>
<td>£40</td>
<td>£21 15/-</td>
</tr>
<tr>
<td>Up to 100</td>
<td>£60</td>
<td>£37</td>
</tr>
<tr>
<td>Up to 150</td>
<td>£70</td>
<td>£48 10/-</td>
</tr>
<tr>
<td>Up to 200</td>
<td>£80</td>
<td>–</td>
</tr>
<tr>
<td>Up to 300</td>
<td>£90</td>
<td>£50 /</td>
</tr>
<tr>
<td>Up to 400</td>
<td>£95</td>
<td>£54 5/-</td>
</tr>
<tr>
<td>Up to 500</td>
<td>£100</td>
<td>£54 15/-</td>
</tr>
<tr>
<td>Up to 600</td>
<td>£105</td>
<td>£56 5/-</td>
</tr>
<tr>
<td>Up to 700</td>
<td>£110</td>
<td>£57</td>
</tr>
<tr>
<td>Up to 800</td>
<td>£115</td>
<td>£60</td>
</tr>
<tr>
<td>Up to 900</td>
<td>£120</td>
<td>£62</td>
</tr>
<tr>
<td>Whole system</td>
<td>£125</td>
<td>£63</td>
</tr>
</tbody>
</table>

Half-yearly tickets are charged at sixty (60) per cent and quarterly tickets at thirty (30) per cent of the above rates respectively.

10. Passengers' luggage not exceeding 2 cwts for First Class Passengers, 1 cwt for Second Class Passengers and 28 lbs for Third Class Passengers is carried free of charge.

11. The prices of Meals in the Restaurant Car are:

- Breakfast: 3/6
- Afternoon Tea: 1/6
- Luncheon: 4/6
- Dinner: 5/6
- Early Morning Tea: 6d.

GOODS TRAIN SERVICE.

12. A Through Goods Train is run in each direction between Iddo and Kano weekly, and additional Through or Sectional Goods Services are run as traffic demands.

13. A tariff of freights is published, and below will be found the rates charged on a few of the main articles of Nigerian trade:

<table>
<thead>
<tr>
<th>Ginned Cotton in Bales. –</th>
<th>Miles</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Iddo Wharf from Zaria</td>
<td>617</td>
<td>80/-</td>
</tr>
<tr>
<td>To Iddo Wharf from Oshogbo</td>
<td>182</td>
<td>57/3</td>
</tr>
<tr>
<td>To Iddo Wharf from Ibadan</td>
<td>120</td>
<td>47/4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ground Nuts. –</th>
<th>Miles</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Iddo Wharf from Kano</td>
<td>705</td>
<td>91/3</td>
</tr>
<tr>
<td>To Iddo Wharf from Zaria</td>
<td>617</td>
<td>84/6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hides, Tanned. –</th>
<th>Miles</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Iddo Wharf from Kano</td>
<td>705</td>
<td>246/4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hides, Untanned. –</th>
<th>Miles</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Iddo Wharf from Kano</td>
<td>705</td>
<td>153/2</td>
</tr>
</tbody>
</table>
Cocoa. –

To Iddo Wharf from Oshogbo 182 110/-
To Iddo Wharf from Ibadan 120 90/10

Palm Kernels and Palm Oil. –

To Iddo from Horin 243 83/7
To Iddo from Oshogbo 182 70/1
To Iddo from Ibadan 120 47/11
To Iddo from Abeokuta 60 26/5 /

Tin. –

To Iddo from Stations between Kai Yerda and Bukuru inclusive 696-761 226/-
To Iddo from Minna 462 160/3

COLLIERY.

14. The Coal Fields at Udi on the Eastern line are worked under the Railway Administration. During the year ending 31st March, 1923, the output was 112,818 tons and the cost of production was 9s. 8·1d per ton.

15. The price of Coal to the Public is:–

<table>
<thead>
<tr>
<th></th>
<th>At Port Harcourt</th>
<th>At Lagos</th>
</tr>
</thead>
<tbody>
<tr>
<td>25s. per ton f.o.b.</td>
<td></td>
<td>45s. per ton</td>
</tr>
<tr>
<td>(with an extra charge of 6d.</td>
<td></td>
<td>(with an extra charge</td>
</tr>
<tr>
<td>per ton for</td>
<td></td>
<td>of 2/- per ton if the</td>
</tr>
<tr>
<td>bunkering.)</td>
<td></td>
<td>Government provides</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the labour for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>handling the Coal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>from the stack to a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>truck or barge.)</td>
</tr>
</tbody>
</table>

16. The Coal produced is of a sub-bituminous quality, and is equivalent to 70 to 75% of the best Admiralty Steam Coal.¹

MOTOR TRANSPORT.

17. In connection with the Railway, Motor Transport services are maintained between Ibadan, Oyo and Iseyin; Oshogbo, Ilesha and Ogbomosho; and Bukuru and Ropp. /

STATISTICS.

18. General Summary for Year ending 31st March, 1923.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital</td>
<td>£12,699,255</td>
</tr>
<tr>
<td>Gross Receipts</td>
<td>1,425,812</td>
</tr>
<tr>
<td>Working Costs</td>
<td>978,110</td>
</tr>
<tr>
<td>Net Receipts</td>
<td>447,702</td>
</tr>
<tr>
<td>Percentage of Working</td>
<td></td>
</tr>
<tr>
<td>Costs to Gross Receipts</td>
<td>68.6</td>
</tr>
<tr>
<td>Percentage of Net</td>
<td></td>
</tr>
<tr>
<td>Receipts to Capital</td>
<td>3.52</td>
</tr>
<tr>
<td>Miles operated</td>
<td>Miles 1,126</td>
</tr>
</tbody>
</table>
HISTORICAL SKETCH.

19. Construction on the Lagos Government Railway was commenced in 1896, and the various sections completed and opened to Traffic on the dates shewn below.

<table>
<thead>
<tr>
<th>Section</th>
<th>Commenced</th>
<th>Completed</th>
<th>Opened to Traffic</th>
</tr>
</thead>
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<tr>
<td>Iddo – Ibadan 120 miles</td>
<td>1896</td>
<td>1901</td>
<td>1901</td>
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<tr>
<td>Ibadan – Iwo 30 miles</td>
<td>1905</td>
<td>1906</td>
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<td>Iwo – Oshogbo 32 miles</td>
<td>1906</td>
<td>1907</td>
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<tr>
<td>Oshogbo – Ilorin 61 miles</td>
<td>1907</td>
<td>1908</td>
<td>1908</td>
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<tr>
<td>Ilorin – Jebba 60 miles</td>
<td>1908</td>
<td>1909</td>
<td>1909 /</td>
</tr>
</tbody>
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20. In 1908, the Northern Nigeria Government commenced the construction of the Baro-Kano Railway for Military and Political purposes, and the line (353 miles) was completed in 1912.

21. It was considered desirable that the two systems should be linked up, and the Lagos Government Railway, with this object in view, commenced building from Jebba in 1909; reaching Minna, the junction with the Baro-Kano Railway, in 1912. In the latter year the two lines were incorporated under the title of the Nigerian Railway.

22. Prior to January 1916, there was no rail connection between the lines North and South of the South Channel of the River Niger at Jebba, and traffic was worked across by means of the ferry ‘Fabius.’ This was a vessel capable of carrying six large wagons or four passenger coaches at a speed of 7 knots per hour, and could also convey, when required for purpose of repair or replacement, any of the heaviest engines on the Railway.

23. The boat was fitted with machinery for loading and unloading wagons, and provided shelter for passengers of all classes while crossing.

24. An inclined slipway was constructed on each River bank at a suitable angle to the stream to enable the ferry to come alongside or leave without difficulty. Vehicles were hauled up or lowered by means of a winding engine and cable.

25. The best month’s work performed by the ‘Fabius,’ including Sundays, was 38.8 vehicles per day of 8 hours. The only difficulty experienced in the working of the ferry was in connection with the steering, which proved difficult at times on account of the strong current at this part of the River.

26. In January 1916, the bridge over the South channel at Jebba was opened to traffic, thus establishing through rail connection. This bridge consists of seven spans of 183’ between centres of bearings with viaducts of three concrete arches.
at each end. The total length is 509 yards, and total weight of girders about 1,020 tons. There are six piers in the river, of which four were sunk in sand to 77’ below water level; one was built on rock 12’ under water at low river. The other was sunk through sand until it rested near one end on a ridge of rock 25’ below the level of river bed. Preliminary borings had given an erroneous idea of the lie of the rock which was found actually to descend in steps to a depth of 57’ below river bed. Steel sheet piling was driven to rock all round the pier. The space under the pier was divided by steel shuttering into three sections to which access was obtained through the dredging holes in the pier. Sand was excavated down to rock and concrete filled in to underside of caisson, each section having to be completed before the next was begun.

27. All this difficult work in connection with the underpinning was done by divers and occupied fully two years. / 28. The time occupied in building the bridge was a little under 5 years, and the total cost about £130,000.

29. The bridge has done much to develop trade and facilitate intercommunication.

30. The Bukuru line, the 2’ 6” gauge Railway (143 miles long), which connects the Tin fields area with the main line at Zaria, was completed in 1914.

31. The discovery of the Coal Field at Udi led to the selection of Port Harcourt as being the most satisfactory port through which shipment of the coal should be made. The construction of a connecting Railway 151 miles was commenced in 1913, completed in 1915 and opened to traffic in 1916.

**COMPARISON WITH ENGLISH STATISTICS.**

32. The Colony of Nigeria is the largest of the British West African possessions; its approximate area being 346,000 square miles practically three times that of the United Kingdom, whilst its population is 18,500,000 against the 46,000,000 of Great Britain.

33. The total length of line open to traffic in the United Kingdom is 23,724 miles, roughly 20% of the total area of 121,633 miles. Nigeria’s 1,126 miles of Railway gives only a percentage of .33 to its area of 346,000 square miles. /

34. The Home Railways in 1921 (the latest figures available) earned £51,923,453 net, representing a return of practically 4% on their Capital of £1,328,049,749.

35. The amount of Capital expended on the Nigerian Railway at the end of March 1923, was £12,699,255, and the net receipts £447,702; the percentage of return being 3.5.

36. The total number of passengers carried on the English Railways during the period under review was 1,252,056,386; or equal to each head of population
making 27 journeys. The number of passengers over the Nigerian Railway was 1,608,713 equivalent to only 87% of the population travelling.

37. The gross tonnage handled by the Home Railways in 1921, was 222,129,313, or 4 tons 16 cwts. per head of population; whilst in Nigeria the gross tonnage conveyed was 560,741; approximately 68 lbs per head.

38. Taking into consideration the sparse population and the small percentage of Railway mileage to total area in Nigeria compared with conditions obtaining in the United Kingdom, the results are encouraging.

39. The Agricultural Department are making every effort to get Africans interested in the cultivation of Cotton, Cocoa, Ground provisions, etc., and as they become educated to the advantages and facilities offered by the Railway for the transport of their produce, there is little doubt that traffic will materially develop
THE FAILURE OF OFFICIALISM.

The Disastrous Record of Government Railway Building.

By Sir Walter de Frece, M.P.¹

It has been left to a Conservative Government, which is opposed to direct State enterprise at home, to readopt for future railway work in East and West Africa the discredited policy of Departmental construction. This policy has been thoroughly tested in the last thirty years. It has on practically every occasion during this period been a lamentable failure. It was only adopted as a costly experiment in bygone times when private enterprise did not exist like it does to-day. In these thirty years it has wasted public money and been denounced in Parliament. It has compelled the Governments, who have resorted to it, to apologise and explain. Yet Conservatism revives this discredited policy of officialism, but before there is further waste of public money the public should realise the gravity of the proposed step and appreciate the hopeless muddles of the past. There is hardly a single railway built by the Departmental System in East and West Africa over which large sums of public money could not have been saved.

Now what is the ‘Departmental System’ of building railways? It is thus stated in the Final Report of the Uganda Railway Committee, which published in 1904 the apologia for the supreme muddle in constructing, by the ‘Departmental System,’ the Uganda Railway; and also set out, as follows, the high hopes with which the Government entered on the work:

‘The Government would in this way profit to the full by its high financial credit; it would not raise one penny of capital beyond that required for the work; it would be able to exercise complete control over the working of the line; it would have at its command men of the highest experience in such matters, actuated by the sole idea of doing the best they can in the interests of the Government; and, above all, it would have a more free hand in respect of rates and

¹ Mr. Ormsby-Gore,² H. of C., June 4. Acting-Governor in Kenya Legislative Council, 1923.
fares; and it would be in a position to profit by the success of the line, instead of merely taking the risk of losses without the chance of profit.’

Such, presumably, is the profession of faith with which any Government starts on this form of railway construction, though, as will be seen below, the Crown Agents had still more comical, but equally misleading, ideas on the Departmental System, in regard to railway building in West Africa. How have all these advantages claimed for the system been justified by experience in East Africa or West Africa? The present generation may forget what has happened, but here are the facts, and it should be recollected that in the history of railway construction there has never been such a reckless, disordered enterprise as the construction of the Uganda Line, whose entire record is an unvarying tribute to official incompetence. Yet in 1896, at the very start of the work, the Foreign Office, which then ‘ran’ the Colonies, priding itself on the Departmental System of construction, remarked with delightful, but misplaced, insouciance that, as against private enterprise, it possessed all the advantages, ‘Authoritative supervision and control of the work,’ ‘smooth and economical method,’ ‘special advantages in respect of labour,’ ‘vigilance, judgment and experience.’ In other words, the Foreign Office, with all these advantages, muddled from start to finish on a truly gigantic scale.

THE UGANDA RAILWAY.

The real cost of the Uganda Railway will probably never be known. Yet it was ‘a line not difficult to construct ... and running over easy country.’ It was first planned to cost £2,227,323 for a length of 657 miles, or if fitted for heavy traffic, £3,685,400, or about £5,600 per mile. Private enterprise of the very highest standing (Messrs. Pauling and Co.) offered to build the line in four years for £2,500,000, all included, or nearly £4,300 a mile.

From its actual inception (December, 1895) the scheme was never worked out properly; the surveys were wholly inadequate, and it was notorious that the cost was underestimated, but the Foreign Office was unperturbed.

At a very early date the Railway fell into the hands of the officials. Sir Percy Anderson’s Committee (1895), on which served men without much, if any, knowledge of Railway construction, cut down the original estimate to £1,755,000 by selecting a lighter road and a narrower gauge. Then the Uganda Railway Committee came into existence, sitting at the Foreign Office, and it substantially took over the Anderson scheme. From the start there was confusion and conflict of views which prejudicially impressed the House. The incompetence characterising the estimate was well known to experts in Parliament, who denounced both it and the ineffective management. Mr. Lloyd George was one of the strongest critics of Foreign Office recklessness of procedure. The progress
of the railway was never kept up to schedule. The provision of labour was badly muddled and inefficient, poorly paid workers being imported from India. Meanwhile, the Government, which (see above) was claiming that it would 'profit to the full by its high financial credit,' was merely at intervals financing the railway out of British public funds, and not attempting to use credit at all. Progress was so slow that the House of Commons were constantly complaining, criticising the methods of management, calling attention to the mortality among native workers, and grumbling at the extra outlay, which in April, 1900, had reached £3,020,000, as against the original estimate of £1,865,000.\(^*\) On this occasion the whole finance was the subject of severe criticism in the House. Even Lord Midleton, then at the Foreign Office, was about £1,000 per mile, 'out' in his estimate of the total cost – five years after the line was started. The one per cent, overriding commission, paid in addition to salaries to the Crown Agents on all stores purchased, was much disliked in the House. No wonder the transference of the work to private enterprise was constantly urged. Still, £1,930,000 more was voted. In 1902, £600,000 more was obtained. By this time it was clear that not only had the cost of the line been grossly underestimated, but the administration charges had been swollen, and the only way money was ever saved was by buying cheap locomotives in America instead of helping British trade. Owing to faulty supervision, vast quantities of the stores were stolen by the natives. In this Debate, Mr. John Burns, as a mechanical engineer with West African experience, expressed himself 'ashamed at the incapacity shown in the construction of the railway.' Mr. Herbert Samuel (now Governor-General in Palestine), who had visited East Africa, recorded the unanimous opinion of all on the spot that there had been 'gross extravagance ... frequent waste and laxity of financial control.'

Ultimately the line was finished early in 1903, whereas the Departmental System engineers had originally expected it to be built in three to four, instead of, as it was, in seven to eight years. The total officially-stated expenditure up to the date when the Committee ceased to control the outlay was £5,297,808. In its apologia, issued in 1894, the Committee claimed that the 'cost had not been excessive.' It was, however, £9,900 per mile as against its own estimate (revised) of £2,840 per mile, and as against an ignored private contractor's tender (Messrs. Pauling) of £4,280 per mile.

\(*\) Including interest (£110,000) during the four years of construction.

THE WEST AFRICAN MUDDLES.

The record of railway construction in West Africa is almost as melancholy a story as the history of the Uganda Railway. The pioneers of railway construction in that part of the Empire were the firm of Messrs. Shelford and Co., the Consulting Engineers to the Colonial Office, who were practically, to all intents

Mr. Brynmor Jones, H. of C., May 7, 1900.
Mr. Col. Williams, April 8, 1897.
Mr. C. Dilke, April 21, 1898.
Mr. G. Bowles, H. of C., May 7, 1900.
Mr. Gibson, H. of C., May 7, 1900.
Mr. J. Burns, H. of C., December 9, 1902.
Mr. Herbert Samuel, H. of C., December 11, 1902.

March, 1903.
and purposes, the chief Government Authority on the spot. They thus officially
summed up the virtues of the Departmental System, which, read in the light of
cold fact, are still more absurd than the merits claimed for it by the pioneers of
the Uganda Railway:

\textit{Cd. 2325.} (\textit{a}) The construction of a railway through an unknown country may be com-
menced departmentally without the delay inseparable from the carrying out of
detailed surveys and the preparation of a contract.

(b) The route of the railway, the accommodation provided, or any other
detail, may be altered to suit the ascertained requirements of the Government
during construction without inconvenience or claims for extras in consequence
of the alterations and modifications usually found to be necessary during the
progress of any works of magnitude.

(c) The construction can follow immediately upon the operations of the sur-
vey parties, thus saving perhaps a year or more in the eventual completion of the
work.

(d) There is no risk of failure to carry through the work if unexpected diffi-
culties arise.

(e) In the case of a hostile attitude of the natives the interference to the work
is minimised.

(f) The facilities for importation and repatriation of labour are increased
under Government auspices.

(g) Confidence in engendered in the native mind by the fact that he is deal-
ing with the Government.

Before proceeding to details, it only needs to be pointed out with regard
to the above that the State in West Africa entirely failed to realise any of the
‘advantages’ specified. The work was rarely done economically; because \(a\) much
was apparently left to chance or \(b\) modified as the work went along. The pre-
liminaries were never fully prepared, and the work was usually in arrears \(c\); the
‘unexpected difficulties’ always found the Departmental System at fault \(d\); and
the arrangements with the natives were always breaking down \(e\) and \(f\); and
the expected confidence was entire absent \(g\). The slip-shod ‘go-as-you-please’
method of constructions simply bled the British taxpayer, while the Departmen-
tal Systemi proudly, in effect, remarked: ‘But we pay nothing to the contract
for any variations in any contract with us.’ It was, however, absence of any fixed
policy which has proved so disastrous.

Indeed, the criticisms of the working of the entire railway constructional sys-
tem in West Africa was so acute that in 1904 Alfred Lyttelton, who was then
Colonial Secretary, felt compel to issue an elaborate defence of it, and called on
Messrs. Shelford Co. to put their case before the public, which they did to the of
their ability and in the most appealing terms.
Such were the general deductions. The railway work can be analysed in detail, though the report referred to is one lamentation against natural difficulties, which were well known to all, against which, to avoid delay, of which there was constant complaint any contractor would have adequately provided in advance.

**THE SIERRA LEONE GOVERNMENT RAILWAY.**

This was built by Messrs. Shelford, and is a narrow-gauge line of relative simplicity of construction. It cost £958,150 for 222 miles, at a cost of £4,316 per mile. It may be added, as an amusing commentary upon the Shelford advantages of the Departmental System (see above), that when this line was being built there was a great deal of trouble with the natives, and there is nothing whatever to show that private contractors would have suffered more from it than State contractors. The cost of Administration was utterly underestimated — indeed, few estimates were correct. There were various additions to the main line when built, which brought the total mileage up to 337, by which time the cost per mile had gone up to £5,020.

**THE GOLD COAST RAILWAY.**

The record of railway construction in the Gold Coast, even among illustrations of the working of the Departmental System, stands out as absolutely unparalleled in inefficient results. The total capital cost of all lines open on December 31, 1921, was £6,081,000, or about £20,000 per mile. This ought easily to establish a record in extravagance. It was built in sections, and the best criticism of how any of them were built is supplied by a remark of the Governor in his speech 1922–23, in which he observed that they had been ‘able to reduce the cost of construction to the neighbourhood of £11,000 per mile.’ This illuminating phrase, ‘neighbourhood of,’ is about as near as the Government ever got to anything in the West Coast. The less said about the construction of the first section of the Gold Coast Railway (Sekondi to Kumasi) the better. There were 167 miles, and they were built at a cost of £1,753,488, or £10,000 a mile, whereas private enterprise offered to build the greater part of the line (Tarquah to Kumasi) for £6,650 per mile, and at a much earlier date than the railway was finished by the Departmentalists. The character of the works was underestimated; the plans were evolved in piecemeal and expensive form; the sickness was abnormal; the scale of labourers’ remuneration was altogether wrong; and the Department cannot cover up its shortcomings by lamenting the ‘competition with the mining companies.’ There was a great deal of labour trouble, which synchronised with the last Ashanti War, which hardly, despite all claims, suggests pleasant relations.

* The actual cost about doubled the official estimate.
between the railway authorities and the local labour. Yet workers were rarely short if properly handled. The Departmental engineers complained pathetically of the scarcity of ballast, which was responsible for very bad work on the permanent way, and of the shipping and landing difficulties, in a form which suggests that they never, anticipatorily, took these properly into account. In fact, nothing worked properly. Small subsequent sections were built, at a cost of £6,100 per mile, and £9,860 per mile. The heavy outlay referred to in the capital cost of the line is, of course, due to very extensive repair and / replacing work. To this it may be added that on June 20, 1923, in the House of Commons, Mr. Ormsby-Gore, on behalf of the Colonial office, admitted the ‘excessive’ cost, but made an *ad misericordiam* appeal.

‘It was a pioneer line made in haste, without adequate surveys, in order to serve the gold mines, which could not otherwise have been worked. It had to be carried throughout almost its entire length through trackless tropical forest, the local labour was entirely inexperienced, and the conditions extremely unhealthy for Europeans.’ Yes ... but the existing difficulties were known in advance and they need not be exaggerated. There were only 40 miles to be built to the mining centres, the country was well known, the surveys and preliminaries lasted for over 12 months. It took about 3 years to build 40 miles (to Tarquah), while even from Tarquah to Kumasi the rate of construction was only 4.8 miles *per month*. Private enterprise was ready to build cheaply, without making lamentations.

**THE LAGOS RAILWAY.**

The Lagos Railway, which started the South Nigerian Railways, was an equally illuminating undertaking. The original section of 125 miles long cost £882,961, or £7,064 a mile, and here again Messrs. Shelford naturally praised their own work, though they complained of the local difficulties, especially the scarcity of ballasting material, which would indicate lack of prevision, since the fact is known to anyone with even the merest casual acquaintance with West Africa. Labour troubles seem, to have been perennial, and in places, so it has always been asserted, a form of forced labour was employed. Moreover, Sir William MacGregor, who was Governor at the time, expressed keen dissatisfaction of the whole system of construction, though the Colonial Office endeavoured to whittle down his remarks to denunciation of the arrangements for medical attendance on the construction staff, which were notoriously bad. It is also an interesting commentary on the work that in 1920 the Colonial Office had to devote £1,107,000 towards relaying the track over a section of this line – not before it was needed. Innumerable complaints have always been made about this railway. Speaking in the House before the War, Sir George Lloyd, now Governor of Bombay, called attention to the totally inadequate provision of almost...
everything needed by traders using the line, such as engines, wagons, tarpaulins, etc., and lamented that it was impossible to obtain redress. The complaints were, in fact, taken up by the London Chamber of Commerce. In later years this line was extended to Jebba and towards Zungeru, but the Colonial Office admitted. ‘a considerable excess in expenditure’ due ‘partly to labour difficulties and partly to the country proving more difficult than was anticipated’ – instances of faulty calculation. Stores were, too, stolen wholesale. The whole of the cost of the 307 miles worked out at £9,478 per mile. The line eventually reached Minna, 467 miles in all from the sea; the constructional costs spread over the whole distance represented £9,209 per mile. In fact, the Colonial Office never seemed able to reduce this vast outlay, and the railway still continues to need additional expenditure. /

THE NIGERIAN RAILWAYS.

The building of the main Nigerian line (Baro-Kano, 356 miles), which was described by Mr. Lewis Harcourt8 as a ‘Splendid achievement,’ was started in 1907 and finished in 1911, at a cost of £3,570 per mile. It is on this line that the Colonial Office prides itself that it can build railways. Its history is interesting. The Blue Book, entitled ‘Correspondence relating to Railway Construction in Nigeria (1905),’ gives an amusing story of the hopeless conflict of opinion as to what should be done. This was substantially due to inadequate survey work; but eventually the Colonial Office, rejecting the advice of Sir Frederick Lugard to build a cheap lightish surface railway (£526,600), recommended on the ground of cost and potential traffic, selected a 3 feet 6 inch gauge, and estimated the cost at £2,015,896, or £5,693 per mile. The line was completed in 1911 at a capital cost of £1,390,251(1912), or £3,905 per mile, an instance, which ought to be historic, of administrative blundering in estimating. This was just over ten years ago. The line may have been built quickly, but it is significant that it has needed large sums to keep it going, and in 1920 £1,093,008, nearly as much as the original cost, was expended on relaying the small section between Minna and Kaduna (on this line) and the reconstruction of bridges between the still smaller section, Zungeru to Minna. The brains of the work, such as they were, were contributed by Royal Engineers lent by the War Office and by South African Railway experts. Anyone can cheaply build railways in Northern Nigeria. The ‘splendid achievement’ was for the most part over very easy country, which presented no serious obstacles. Events have proved Sir Frederick Lugard to be correct in anticipating that the heavy cost of construction would compel the charging of freights which would seriously interfere with traffic, a view which was endorsed by the Earl of Ronaldshay,9 and now proved to be true.

H. of C., June 27, 1912. Cd. 2787.
H. of C., June 20, 1923.
Mr. Ormsby-Gore, H. of C.,
June 20, 1923.
Cd. 2787.
H. of C., August 22, 1907.
The Eastern Railway cost £12,828 per mile to build, and, apart from the Gold Coast, furnishes one of the highest rates on record in the annals of normal railway construction in the British Empire.

The Bauchi Line (88 ½ miles), over very good level country, was only a light railway, but cost £1,977 per mile; moreover, by adding this reduced figure to the cost of all the other Nigerian lines, the Colonial Office manages to bump the average mileage rate down to £10,685, an instructive figure when it is recollected that the French built the Kayes-Niger, Dahomey, Porto Novo-Saketel, French Guinea and Ivory Coast lines at an average mileage rate of £5,370.

No further comment is needed, save the very obvious explanation that these Colonies have railway staffs and railway engineers who have to be provided with something to do. They get that ‘something’ all right under the Departmental system, but it crushes the finances of the various Colonies, it does not lead to satisfactory results, and the traders of this country suffer bitterly, by the heavy freight charges which are inevitable if the railways are even approximately to pay.

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UGANDA RAILWAY.

BY

F. L. O’CALLAGHAN, Esq., C.S.

[...] The general configuration of the country shows a steady rise from the coast inland for about 350 miles to the highlands of Kikuyu, then a sudden dip into a valley, varying from 15 to 20 miles in width, and running generally in a north and south direction, an equally sudden rise to a second ridge, the Man, and a gradual descent to the lake.

The valley, called the Great Rift Valley, is one of the remarkable features in this part of Africa, and extends for several hundred miles. Apparently it is due to an immense subsidence or ‘down-throw.’ It has several extinct volcanoes along its floor, and many lakes, most of which are salt. The crest of the eastern escarpment varies from 7,000 to 11,000 feet in height above sea level, and that of the western one is somewhat higher.
The descent into and ascent out of this valley were the two difficult problems in the construction of the railway, so far as the physical features of the country are concerned.

In August, 1895, Her Majesty’s Government having decided to construct the railway, a small grant for preliminary expenses was obtained from Parliament, a supervising Committee, with Sir Alexander Rendel1 as Consulting Engineer, was appointed in London, while a Chief Engineer, with a proportion of staff sufficient for the work to be at first undertaken, was despatched to Mombasa, where the party arrived towards the close of December in the same year.

The matters requiring the Chief Engineer’s immediate attention were the preparation of a base on the coast and the survey of the best route to the summit of the coast hills, these hills rising rapidly for the first 15 or 20 miles inland from the sea.

It was at once obvious that the best site for a base was to be found on the island of Mombasa, because excellent harbours existed on both sides of this island, and on it was the only large piece of open and tolerably level ground available, as had already been noted in Capt. Macdonald’s report.

The preparation of the base included the following:–

1. Housing of staff and shelter for imported labour.
2. Preparation of a station site, and sites for store yard, stacking ground for permanent way materials, girders, and such like.
3. Construction of a landing stage for stores, and its connection by rail with the stores yard, and stacking grounds.
4. Construction of workshops for the erection and repairs of locomotive engines and rolling stock, and for other work connected with the railway.
5. Organization of offices for accounts and stores.
6. Connection of the island with the mainland by a temporary bridge.
7. Water supply, including erection of condensing plant.
8. Organization of an agency in India for the supply of labourers and of food for them, besides sundry stores procurable in that country.

The survey parties arranged were eventually three in number. The first, a strong party, examined the country in detail, staked out the railway, for construction, ahead of the working parties, and prepared the usual large scale plans (400 feet to 1 inch) and working sections.

The second party was despatched to Kibwezi (mile 190) to work backwards until met by number one party. This was desirable, as the country is somewhat intricate between the 150th and 190th miles, and it was important that the plans and sections should be ready in time to prevent any delay to construction works.

The third survey party was sent on to Kikuyu to investigate the different routes that might be possible from the Athi plains across the escarpment and into the great Rift Valley, and, when the best route was ascertained, to mark it
out and complete the working plans and sections; then to go forward and similarly examine the Mau range on the west side of the valley, fix on the best point for crossing this, the last and highest of the two great ridges to be surmounted, settle on the best route to the lake, and finally to prepare working plans and sections.

The first and second parties joined up in November, 1897, and these continued the location work from mile 190 onwards to mile 325, where the third had started, completing this work by October, 1898; but the third party did not finish its task until April, 1900. / The difficulties which had to be overcome by these parties varied somewhat in different localities, but on the whole their work was of an arduous nature.

On the first 200 miles from the coast the country, for the most part, is covered by dense thorn bush, which has to be cleared for every survey line run.

This bush is infested with tsetse fly,² fatal to all beasts of burden, thus limiting the means of carriage to that by native porters; the ‘fly’ district extends for some 30 miles or so beyond the thick bush, or up to the 220th mile.

The Kikuyu and Mau ranges are clothed by heavy forests with thick undergrowth, making survey work tedious and difficult.

Up to mile 320 the country is sparsely inhabited and produces no surplus food stuffs, while water is scarce and bad, being in most cases impregnated with salts injurious to health.

Moreover, in addition to these difficulties inherent to the country, the first party, during the early months of 1896, was impeded by disturbances due to a local rebellion, which made it dangerous to establish isolated camps without strong escorts, and escorts were not readily available, all troops being employed in suppressing the rising.

The positive hardships endured by the first survey party were severe; frequently, by the desertion of porters, they were in danger of starvation and of the horrors of thirst, while all, both Indians and Europeans, suffered severely from malaria fever, and the former from ulcers and sores due to the thorns of the aloes,³ cactus, and other bushes through which they had to cut their way.

The third survey party found that, as surmised by Sir Guilford Molesworth⁴ in 1891, the lowest point on the Mau range was between the Guaso Masai Valley on the east and Nyando Valley on the west, the summit being 8,321 feet over sea level, the ground falling away very quickly on both sides. The highest point is in the 489th mile, and for some little distance on either side works will be easy.
The ruling gradient adopted for the coast section was 2 per cent., with 10°* curves as a maximum, and the same ruling gradient has been used over the Kikuyu and Mau ranges, but in combination with 7°† curves.

Wherever the permanent working section showed heavy earthwork, which could not be completed in time to allow of the rails being laid over them, temporary lines, commonly called ‘diversions,’ were marked out, with gradients as steep as 3 per cent. and curves of 14° in order to keep these diversions as near the natural surface of the ground as possible, and thus keep down both their coast and the time necessary to construct them.

On the first portion of the railway up to Nairobi (326th mile) the aggregate length of diversions was about 40 miles. On the second portion the total length of these temporary lines will not fall far short of 44 miles.

The selection of temporary lines, as a rule, preceded that of the final permanent location, and required quite as much care and study of the ground.

Notwithstanding the care taken, some of the temporary works were of considerable magnitude; the first, of course, was the temporary bridge connecting the island of Mombasa with the mainland; next, a trestle structure across a ravine in the 12th mile; while every river met had to be temporarily crossed by bridges made with sleeper stacks and girders. Many other temporary structures were required, such, for instance, as stages for water tanks at temporary stations, for which timber is used.

While the first party of Engineers was on its way to East Africa, permission was obtained from the Government of India to recruit labourers in that country, this permission being necessary under the Indian Emigration Laws; arrangements were also made with that Government for the loan of an experienced engineer from their Public Works Department, as well as of a medical officer, with sufficient hospital staff. These in the first instance were engaged in selecting labourers, and about one thousand Indian navvies, with a proportion of carpenters, blacksmiths, rivetters, masons, etc., were shipped for Mombasa; several surveyors and draughtsmen, and also European and Eurasian overseers, were procured and despatched. An accounts officer was borrowed from the same source, who selected and engaged a staff of Indian accountants and clerks, and arrived in Africa with them during February, 1896.

In England a supply of tools, plant, workshop machinery, tents, iron houses, permanent way materials, small bridge girders, timber beams and scantlings, locomotives and rolling stock were contracted for, and the first shipment reached Mombasa in April, 1896, followed by others at frequent intervals.

* 573 feet radius.
† 816 feet radius.
The temporary bridge to connect the island with the mainland — over a channel about one-third of a mile wide, with a depth of water up to 17 feet at high water — was then put in hand and completed by the 4th August, 1896, on which date the rails were laid over it, and plate laying may be said to have commenced. This bridge had to carry the whole of the traffic passing up the railway for a period of nearly three years. Before two years had elapsed the supporting piles were nearly destroyed by that marine pest the teredo navalis, and heavy renewals were necessary. [...] It is usual to guard timber used in marine works either by sheathing it with zinc or by covering all exposed surfaces up to highwater mark with ‘scupper nails,’ i.e., a nail with a large flat head and a very short shank. These nails very quickly rust and cover the timber with a hard layer of red oxide of iron, thus preserving the timber from attack.

The conditions under which construction had to be carried on precluded heavy works of any kind being executed far from the rails, because the carriage of food and water in large quantities, except by rail, was practically impossible. The ‘telescopic’ method, therefore, was imperative, and no pains were spared to obtain, even at the cost of very steep gradients and sharp curves, as nearly a surface line as possible. Once the rails were laid, the heavier permanent cuttings, embankments, bridge, and culverts could be attacked with large gangs of workpeople to the full extent that economy of construction rendered advisable, and completed without further difficulty.

In the first instance the utmost that could be done was to keep a gang of about 300 Indian earthwork coolies at from one to two miles in advance of railhead, clearing away the bush and preparing the temporary surface line.

The supplying of these coolies, as well as the plate laying gangs, with food and water was a constant source of anxiety. The accumulation of spare food sufficient for some few days was not a matter of very great difficulty, but water, which had to be carried daily by train, and of which the supply in Mombasa was limited, was a serious matter, and any breakdown in its supply might have been followed by terrible consequences. At the railway base it was necessary to erect heavy plant for the supply of fresh water by distilling sea water, because the wells in the island gave little more than sufficient for the requirements of the fixed population.

[...] On the 10th November the railhead was at mile 460 on the eastern slope of the Mau range. The number of labourers had attained its maximum during August last, and the full supplies of locomotives and rolling stock were completed in December, 1899, and in April, 1900, respectively.

The number of workpeople to be employed depended on the amount of work opened up by the advance of the rails, and thus their increase, as shown in the diagram, is proportionate up to a certain point to the advance of the line.
The principal permanent structure on the first 360 miles of the railway, i.e., up to the Kikuyu Escarpment, is the long steel bridge on screw piles connecting the island of Mombasa with the mainland, completed on the 28th June, 1899, and now called the Salisbury Bridge [...]. The spans are 60 feet in the clear each, and the roadway, with a footway for men engaged on the railway, is on the top of the girders.

The next largest bridge is one of four spans of 60 feet over the Tsavo River, mile 132 [...].

Twenty-six other girder bridges of 40-foot span and upwards have been built, or are building, on this length, as well as a very large number of drains, culverts, and minor girder openings.

The bridges are of three types as regards piers and abutments – first, masonry piers and abutments; second, piers and abutments of concrete; and, lastly, trestle piers, composed of 3-foot diameter steel cylinders, braced together with cross girders and angle iron, the cylinders being filled with concrete.

Small drains are provided for by stoneware pipes, 12 inches and 18 inches diameter, laid on a concrete bed; larger drains are of oval steel cylinders on concrete, while arched culverts from 3-foot to 15-foot spans are usually of concrete. The whole of the masonry and concrete work is made with Portland cement, because no limestone, except coral, on the coast, is to be found; concrete and masonry, therefore, are very costly, and when possible they have been avoided.

The largest single-span girder bridge on the railway is 100 feet clear span, and there are two such spans (both with ‘through’ roads). The girders are triangulated open web, weighing with cross girders, etc., 65.6 tons each span; all other girders are of the plate web type, with road on top of girders, and are classed as follows:

- 60-foot spans, weighing 22.3 tons each span.
- 40-foot spans, weighing 10.15 tons each span.
- 20-foot spans, weighing 3.16 tons each span.
- 12-foot spans, weighing 1.16 tons each span.
- 10-foot spans, weighing 0.19 cwt. span.
- 6-foot spans, weighing 0.11 cwt span.

On the 13 miles required for the descent from the Kikuyu summit to the floor of the Great Rift Valley eight ravines are met with, which are being crossed by steel trestle viaducts varying from 120 feet to 780 feet in length, and from 32 feet to 85 feet in height at the deepest points. Embankments over these would have necessitated very long and costly culverts owing to the steep side slope of the escarpment, and in many instances it is doubtful if the earthworks would have stood, while they would in any case have been a constant source of trouble and anxiety. [...]

...
The viaducts are of the ordinary trestle type, the tower spans being 20 feet, the intermediate spans 40 feet, and the batter of the legs 1 in 6.

[...] As regards the method of erection. A traveller, with jib 8 long enough to reach to the forward tower, stands on the last completed span, and the pieces being brought up on a lorry which passes underneath the traveller, [...] are then laid hold of by a tackle and traversed forwards into place, or raised and lowered by winding on one winch and paying out on the other.

A third tackle at the mast takes the tail of the 40-foot girders, which are the heaviest pieces, when putting them into position. Besides these main tackles there are light ones worked by hand for raising and holding in position the smaller parts. By these means the viaducts can be erected very rapidly, and when one is finished the traveller is conveyed on its own wheels to the next.

The erection of these is now in progress. That the spans adopted are the most economical is proved by the fact that the total weight of the girder work is almost exactly equal to the total of the bents or piers.

Along the floor of the Rift Valley itself, which is crossed / very obliquely, the works are of a simple character, only two streams of any magnitude being met with. The first 15 miles up the slope of the Mau range is also easy, but from mile 465 onwards to 539 is the most difficult and costly part of the whole of the railway. On these 74 miles there will be twenty-eight steel viaducts, similar to those on the descent from Kikuyu, varying in length from 160 feet to 880 feet, and in height from 30 feet to 110 feet, the severe side-slopes here also rendering embankments with consequent culverts inadvisable. In the 526th mile a narrow high spur necessitates a short tunnel about 200 yards long, the only one, strange to say, on the whole length of this railway. Between mile 539 and Port Florence (mile 582) eleven rivers have to be crossed by bridges varying in size from one span of 40 feet to three spans of 60 feet.

At Port Florence there will be a small engine-repairing shop, and a jetty at which steamers can load and discharge cargo.

Station buildings are of the simplest character, made of timber framework covered with galvanized corrugated iron, easily removable to other sites when advisable.

The headquarters station has been fixed at Nairobi (326th mile), 5,600 feet above sea level, the last point at which an open level plain is found before entering the broken country of the Kikuyu range. Here are being constructed the central workshops and offices, the elevation insuring a tolerably cool climate. Other engine-changing stations, besides the two termini, are at Voi (mile 100), Makindu (mile 207), and Nakuru (mile 450).

On the portion of the railway between Kikuyu and the Lake the first temporary structure is in the 363rd mile [...]. Here the heavy works on the descent into the valley commence, and as they would evidently take considerably over a year
to complete, it was decided to construct a rope lift to lower materials into the valley. This lift or incline overcomes a difference of level of 1,523 feet, and consists of four portions. Two of them – one at the top and one at the bottom having inclinations of 16 per cent. and 9 1/2 per cent. – are laid as double lines, with drums at the top of each, round which a steel wire rope is passed. The railway wagens are run down and up these inclines, the full wagons going down, hauling the empty ones up, speed being regulated by brakes on the drums. The two middle portions are on inclines of nearly 50 per cent., similarly worked by steel wire ropes, 1 1/4 inches in diameter, passing round 'Howard' Clip drums attached to winding engine. On these inclines the wagens are taken on a carrier built with its top horizontal, having a pair of rails to take the wagon, and suitable clips and fastenings to keep the wagens in place while being lowered.

The gauge of the carrier inclines is 5 feet 6 inches, in order that lateral stability may be insured.

At the top the carrier comes up against a platform (beneath which is fixed the clip drum), so that the rails on the carrier form a continuation of a road ending on the stage front, thus allowing a wagon to be pushed on to the carrier by hand. At the bottom the carrier goes into a pit until the rails similarly coincide with a road, on to which the wagon is pushed off.

The line is a double one, but on the lower side of the middle point the rails overlap so as to save width in the cuttings and to economize sleepers.

From the foot of this lift a temporary line is laid until the permanent alignment is reached at mile 375.

Besides ordinary temporary bridges over the Morendat and Gilgil Rivers no diversions are needed until the 460th mile is reached, but between that point and Mau summit there will be 15 miles of temporary railway with 3 per cent. grades and 14” curves, and with several reverses or zigzags. Between the summit and mile 539 22 miles of diversions are laid out, the steepest grades in this case being as much as 4 per cent., as they will be with the load.

The permanent way used consists of 50 lbs. per yard 'Vignoles' pattern steel rails, laid for the most part on steel transverse sleepers of the 'pea pod' pattern, with clips punched up out of the solid, and the rails fastened in with a taper steel key. Where much salt is found in the soil creosoted pine sleepers are substituted for the steel.

For details of the permanent way material reference may be made to *Instruction in Military Engineering*, Part VI., Plate XX., and *Notes on Permanent Way Material, etc.*, by W. H. Cole.

In the first instance the road has been laid without ballast, as it seems to have been a leading idea with every engineer who advised on the project that ballast would be a luxury. On the first section, across the desert portion, the natural soil, being of a sandy nature, has up to the present answered fairly well, but the black
soil between mile 275 and Nairobi turned into a quagmire during the first rainy season after laying, and blocked the traffic for over a month. This was foreseen by all who had had experience of similar country and of tropical rains, and the Chief Engineer had made arrangements to collect ballast for this section in any case. The result of this experience was that the Supervising Committee at home decided to ballast the whole length of the line.

The locomotives built specially for the railway are 6-wheeled coupled, with a load of 10 tons on each axle. Just over one-half of the total number were purchased from the Baldwin Company in America, and these have a pony truck (two-wheeled bogie) in front which on the sharper curves is of much advantage, and enables the coupled axles to be kept closer together.

The total number of locomotives on the line is 92, made up as follows:—
Six second-hand shunting engines from India.
Sixteen second-hand 6-wheeled coupled engines with pony trucks, also from India, but of low power.
Thirty-four standard type engines from England.
Thirty-six standard type engines from America.

The particulars of these standard engines are:—

- Diameter of cylinder: 14 1/2 inches.
- Length of stroke of piston: 20 inches.
- Diameter of coupled wheels: 42 1/2 inches.
- Firegrate area: 13.4 square feet.
- Heating surface: 766 square feet.
- Working pressure in boiler: 160 lbs. per square inch.
- Wheel base (rigid): 11 feet.

**Tender:**

- Number of wheels: 6.
- Wheel base: 7 feet 10 1/2 inches.
- Capacity of tank: 2,000 gallons.
- Capacity for fuel: 180 cubic feet.

The rolling stock has steel underframes in all cases, and the goods stock built for the line is wholly of that metal. The 120 old ballast wagons purchased in India have wooden frames, but these are nearly worn out.

The whole of the stock is fitted with central buffers and the Norwegian pattern coupling hook, which seems to be stereotyped by English makers, but which is a fruitful source of breakaways during the time the road is rough and unballasted.

Rolling stock consists of
149 passenger vehicles,
3 horse boxes,
25 cattle trucks,
3 powder vans,
60 special water tank wagons,
50 brake vans,
850 goods wagons.

The peculiarities appertaining to this part of Africa have thrown upon the Chief Engineer many duties beyond those which ordinarily fall upon the railway builder. Although it was known that skilled labour did not exist, it was hoped and supposed that the natives would readily take up earthworks, and for over two years every possible effort was made to induce them to labour. On several occasions it seemed as if these efforts would be successful, and at one time as many as 1,700 local men were on the works, but their stay was always fitful, and after a week or two the numbers quickly melted away. Even the pressure of famine, which in 1899 was heavy in the land, failed to make them work – they preferred to die.

Indian labour, therefore, had to be relied on altogether, and although costly, owing to the expenses of importation and repatriation, the Indian navvy has been the only sure workman. The outbreak of plague in India during 1897 was the cause of much delay and great additional trouble and expense, adding considerably to the work of the agent in India.

Transport was another serious undertaking. Many efforts were made to work animal transport in the ‘tsetse fly’ region, as porters were very difficult to obtain in sufficient numbers, but after a loss of nearly 1,500 animals their use had to be abandoned. Towards the end of 1897 the Consulting Engineer recommended the trial of traction engines of an improved pattern, manufactured by Fowler & Co., of Leeds; two were ordered and delivered in March, 1898. After a few months’ trial they proved so satisfactory that two more were asked for and sent out, and all of these have done excellent service ever since.

The particulars of these traction engines are as follows:

The engines are compound.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinder, H.P.</td>
<td>6 3/4 inches diameter.</td>
</tr>
<tr>
<td>Cylinder, L.P.</td>
<td>11 1/2 inches diameter.</td>
</tr>
<tr>
<td>Piston stroke</td>
<td>12 inches diameter.</td>
</tr>
<tr>
<td>Boiler pressure</td>
<td>180 lbs. per square inch.</td>
</tr>
<tr>
<td>Revolutions</td>
<td>150 per minute.</td>
</tr>
<tr>
<td>Brake, H.P.</td>
<td>70</td>
</tr>
<tr>
<td>Speeds, fast</td>
<td>5 miles per hour.</td>
</tr>
<tr>
<td>Speeds, slow</td>
<td>2 1/2 miles per hour.</td>
</tr>
<tr>
<td>Weight of engine</td>
<td>18 tons 18 cwt.</td>
</tr>
<tr>
<td>Fuel, oil tank capacity</td>
<td>50 gallons.</td>
</tr>
</tbody>
</table>
Coal bunker capacity 9 cwt.
Water tank capacity 400 gallons.
Water in tender 900 gallons.

Beyond mile 250 mules and oxen have been employed with success.

The provision of food for the small army of labourers now nearly 20,000 strong is no light undertaking. Flour in large quantities has to be imported from India, but as a check on the suppliers corn mills had to be set up in Kilindini, and wheat is occasionally imported from England.

The amount of bridging to be provided for the passage of maximum floods called for early decision on the part of the Chief Engineer. This question is one of the most difficult matters to determine in any country which has not a long series of rainfall records, and particularly so within the tropics. To the railway engineer the average annual or monthly rainfall is not a matter of so much moment as the maximum fall that may take place in 24 hours, or 6 hours, or 1 hour, depending on the areas affected in each case. Mere inspection of the watercourses is, as a rule, misleading, more especially as the railway works tend to concentrate the flow that would otherwise pass by many small and, in the dry season, unnoticeable channels into the main depressions. Already on this railway there have been several instances of pipe drains being superseded by large culverts, and one in which a drain has been replaced by a girder bridge of 40 feet span. It is very possible, / indeed probable, that longer experience of the country will show other weak points necessitating revision of the provision for waterways. Within my own experience I have come across several instances where maximum floods occurred at intervals of from 30 to 50 years. In the case of one of these, where I was fortunate enough to obtain a very precise record of an old flood, the reliability of the information was doubted by those in high authority, and the waterway provided in the design for a bridge was curtailed. Many years after I witnessed a flood in this river which rose 2 feet higher than the level shown by the old record, resulting in considerable damage to a large military station, aggravated by the still further rise caused by the throttling of the river by the bridge so built. The river above the bridge drains an area of over 3,000 square miles, and at several places within that area a rainfall of upwards of 20 inches within 24 hours was registered on this occasion. Over smaller areas the intensity of rainfall is frequently much greater. I have known of a fall equivalent to 4 inches in 50 minutes registered in a basin of 5 square miles.

In another case of a bridge of three spans of 150-foot girders the under side of the girders was at a level of 15 feet above the roadway of an adjacent public road bridge which had been in existence for over 20 years. Both were swept away by a flood, which must have been 20 feet at least above the level of any previously recorded.
During the present year the Rajputana railway in India (a line 25 years old) has been breached in many places by floods, although hitherto it has been considered that the waterways allowed on this line had been excessive.

These instances, out of a very large number on record, show the amount of care and of study of all data and records available, which is necessary in deciding on the openings to be allowed for the passage of flood waters through a railway. It is desirable, however, that over-caution in this respect should not lead to extravagance; neither, on the other hand, should too great a regard for present economy lead to ultimate waste of time and money.

In order to provide for the traffic that may be gathered from the shores of Lake Victoria, and for the distribution of imported goods, steamers will be placed on this inland sea to be worked in communication with the railway. The whole of the material and engines will be prepared in this country ready for erection, and will be forwarded directly the rails reach Port Florence. /

The leading dimensions of these vessels will be as follows:–

<table>
<thead>
<tr>
<th>Description</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>175 feet</td>
</tr>
<tr>
<td>Breadth</td>
<td>29 feet</td>
</tr>
<tr>
<td>Depth (moulded)</td>
<td>9 feet 6 inches</td>
</tr>
<tr>
<td>Draught (loaded)</td>
<td>6 feet</td>
</tr>
<tr>
<td>Speed</td>
<td>10 knots when loaded.</td>
</tr>
<tr>
<td>Cargo capacity</td>
<td>150 tons</td>
</tr>
</tbody>
</table>

Engines, triple expansion with twin screws.

**Supplementary Note on Traffic.**

A few remarks on this subject may not be out of place. The railway is opened for public traffic up to the last complete station interval as soon as possible after the rails are laid, generally within a month or two, to the great convenience of travelers and of the Protectorate Authorities. The public traffic, i.e., all traffic not on account of the railway itself, has averaged about £4 per mile per week since the first length of 100 miles was opened in February, 1898.

Stores, troops, and other passengers connected with the Protectorates have been conveyed to the extent of 5,000 tons of stores and 47,000 passengers, including troops. The difference in cost of conveying these by rail as against road transport has up to June, 1900, amounted to about £300,000; while during the Soudanese Mutiny in Uganda in 1898 the saving in time in transport of reinforcements just saved the situation. /
APPENDIX I

Summary of Captain Pringle's Description of the Method of Surveying for the Reconnaissance Survey of 1891.

The daily route was traversed with compass, aneroid barometer, and pedometer, and the plan plotted on the field. The general slopes of the country at right angles to the traverse were observed with Abney's levels. By a combination of these cross sections with the barometer observations the plans were approximately contoured at vertical intervals of 100 feet. A section was at the same time prepared from the barometer readings, corrected as far as possible for the daily wave and for atmospheric changes. These field plans were re-plotted in camp, linked together by triangulation where feasible, and otherwise by astronomical observations, and were amplified by sketching in surrounding country by means of plane tables set up on commanding points.

The dense nature of the bush and want of time preventing regular triangulation, astronomical observations were made to check the positions occupied at the end of each day's march, one or other of the following methods being used as was found suitable:–

(a). Latitude and azimuth observations to any well-defined point previously fixed to the north or south of the camp.

(b). Latitude and distance observations where the only previously determined points lay east or west of the camp, the distance being determined by measuring a short base, and taking theodolite or sextant observations from either end.

(c). When the above two methods failed, the position of the camp was determined by latitude and longitude observations, the latter depending for their accuracy on the ratings of watch chronometers.

(d). Observations for absolute longitude were taken whenever opportunity occurred of occultations, either of a star by the moon or Jupiter's first satellite, and thereby the ratings of chronometers were checked.

During halts of 24 hours or over diurnal wave curves were made for each aneroid barometer, and instruments were frequently checked and adjusted. Notes were made during each day's march on the following points:–

Number and position of all small waterways crossed; breadth height of banks, high flood marks, nature of soil in bed and banks, slope of bed and depth of water, if any, of all streams of 20 feet in width and upwards; and of the general, physical, and geological features of the country.'

APPENDIX II.

Method Employed for Final Survey.

The method adopted for the final survey was the usual one of a theodolite and chain traverse following a route determined by preliminary trial lines. This
traverse is levelled over with sights taken at every chain; and, where necessary, frequent cross-sections with the spirit level extending according to circumstances for so much as 400 yards on either side of the traverse are made. By means of the longitudinal section combined with the cross-sections a contoured plan is plotted, with contours at 10 foot vertical intervals.

On this plan in the office a centre line is laid out, and a rough section prepared from the contours; when found satisfactory it is transferred to the ground, and then a final set of levels is taken over it, from which the working section is prepared.

It may be explained that for railway work a transit theodolite is the instrument usually employed, and for measuring a 100-foot chain is used, pickets being driven at every chain length nearly flush with the ground on which levels are taken, as well as intermediate points where necessary.
To construct a railroad of over 500 miles in length, under the most favourable conditions and in the most highly-civilized country, is not a task to be lightly undertaken; but when a work of such magnitude has to be carried out in the heart of the Dark Continent of Africa the difficulties are well-nigh appalling – and, judging by what has been done or attempted by foreign Governments in their African dependencies, only surmountable by British engineers and under British administration. Such a work has not only been planned and commenced, but will at no distant date become an accomplished fact, and the silence of the shores of the Victoria Nyanza, that great inland sea in the very heart of Africa, will be broken by the whistle of the locomotive and the bustle inseparable from a great railway terminus.

Every reader of The Wide World has heard of the Uganda Railway, but it is a matter for speculation as to how many realize what these two words mean. Well, then, they mean that a wide track has been cut for a distance of 500 miles, or about the same distance as from Euston to Aberdeen, across swamps, through primeval forest, through malarial and tsetse-fly ridden belts, where horses cannot live and man becomes fever-stricken, across high, wind-swept plateaus and round mountains in places almost as steep as the sides of houses, until the beautiful Nyanza with its wave-lapped shores is reached. The wonders of this line cannot be better summarized than in the words of Sir Harry Johnstone, His Majesty’s Commissioner in Uganda, one of our ablest administrators and certainly our most interesting despatch-writer.
‘I wonder,’ he says, ‘if in England the importance of one aspect of this railway construction has been realized! It means the driving of a wedge of India, two miles broad, right across East Africa, from Mombasa to the Victoria Nyanza. Fifteen thousand coolies, some hundreds of Indian clerks, draughtsmen, mechanics, surveyors, and policemen are implanting the use of the Hindustani language, are carrying the Indian Penal Code, Indian postal system, Indian coinage, Indian clothing, right across these wastes, deserts, forests, and swamps, tenanted hitherto by wild, naked savages or wild beasts. It is one of those strong gouges which civilization employs to rough-hew her ends – a gouge which leaves a great, clean track of good, sprinkled at its edges with items of suffering, little deeds of harm and unintentional injuries of atoms. As you roll by so smoothly in a well-appointed carriage you see occasionally from the windows, perhaps twice in three hundred miles, a headless corpse flung on to the grass below the embankment. It is a native who has not yet realized the truth, so frequently told at British railway stations by placard, that “it is dangerous to walk along the line.”’ Contrasting the lesser ills, Sir Harry Johnstone says that ‘the railway has taught the negro the value of honest work and has saved thousands from death by famine. To the hungry people of East Africa dying from the result of three years’ drought the railway has brought food and shelter, and the Masai who, a year ago, were chiefly engaged in raiding and slaughtering are now working as navvies on the line, decently clad for the first time in their lives.’

Before proceeding with my more immediate task – the recital of some of the difficulties encountered from wild beasts – it will not be inappropriate to give a few ‘dry’ but useful particulars concerning this line.

It has now been five years under construction, having been commenced in January, 1896, and at the time of writing rail-head is somewhere about the Salt Lake Nakuro, some 460 miles from the coast terminus of Kilindini, at Mombasa, thus leaving a distance of 120 miles to be constructed before the terminus at Port Florence, on the Victoria Nyanza, is reached – probably in another year.

The photograph on the preceding page (not included) shows a portion of the line near Mackinnon Road Station, in the Taru Desert. A curious contrast is here shown – a group of naked Wateita natives standing complacently at the side of the track watching the inspection trolley, which has just returned from a trip along a section of the line. This vehicle is worked by the Indian coolies, a number of whom are shown in the photograph (not included).

For the first 200 miles the line has had to be constructed through dense forest; and the second picture, taken near Masongoleni Station, 180 miles from Mombasa, shows the method of working, after a path has been cut through the trees and thorns for the railroad track. Here a gang of coolies are seen engaged in making a cutting, the baskets of earth as removed being used to form the embankment. On some parts of the line the earth-work has been insignificant
compared with the dense, thorny jungle and the difficult work of grubbing up and removing stumps from the track.

But, as I said earlier, this great railway line is an accomplished fact for a considerable distance, and in order to show what travelling is like on a Central African railway I will give a few extracts from a letter recently received from a friend who has by this time safely reached his destination in Uganda.

‘Last Thursday,’ he says, ‘we got a special train to take us up as far as Kikuyu, 340 miles from the coast, where we spent some time encamped beside the railway siding at Kikuyu Road. There was, of course, much to interest and instruct along the railway route. We have journeyed the 340 miles from Mombasa in about a day and a half. Starting at noon on Thursday we arrived at Kikuyu about midnight on Friday – not a bad speed considering that we have ascended over 6,500ft. on African soil on a single line. The first stage of the journey, to Voi, ninety-five miles, took till midnight to traverse – just twelve hours. But this included, besides various short stoppages on the line, a halt of four hours at a place called Samburu, occasioned by an accident to a train ahead. The country between Mombasa and Voi was fairly interesting. The scenery was pretty ordinary, and reminded one very much of Surrey at times – low thorn bush and scrub in the foreground, with hills behind. A few villages and occasional signs of cultivation appeared at intervals. At Samburu, which is in the waterless Taru Desert, our enforced detention enabled me to go off for a good long walk, mostly along the rails, for fear of missing the train when she should start. I walked on so far, in fact, that I did not hear the warning whistle of the engine, and had to stop the train when it overtook me. I must have wandered ten miles or so, but it was in the late afternoon and was very pleasant. I took my place in the train, and at midnight was awakened with the news that we had reached Voi, a hundred miles up the line, and that a dinner awaited us hard by the station. And, sure enough, a bare 100 yds. from this Central African station we found a well-kept, spacious restaurant, where a hot six-course dinner was immediately served at 2 1/2 rupees a head! We had soup, fish, game, mutton, plum-pudding, and fruit. Voi is a large and important station, just like any country station in England. After dinner, contrary to custom, we again entrained, and, travelling all through the night, reached Makindu, another large station, at 9.30 the next morning, just in time to do justice to breakfast, which was ready immediately on the arrival of the train, as at Voi. Makindu, 200 miles from Mombasa, was not even known two years ago, but is now a large Indian settlement – all railway hands, of course. The luxury of dining-cars being at present unknown on the Uganda Railway, we bought at this place cold meat, vegetables, and fruit, and took them on board to eat for the midday meal on the way.

‘After leaving Makindu we saw a good deal of monotonous desert scenery. Taken as a whole the country through which the line passes is very thinly inhabited. As
we sped along we passed a few swamps with long grass, which, we were told, would be the sort of thing we should have to march through later on. The mountains we saw varied in range from 3,000ft. to over 7,500ft., and included the grand Kilimanjaro range. Numerous Indian encampments, consisting chiefly of breakdown gangs, were scattered along the line. Some of the temporary bridges over which we passed were decidedly shaky, and occasionally have given way under the weight of heavy trains. We were told that we were very fortunate to have escaped accident or breakdown. During the journey I espied two rhinos, some ostriches, two elands, and several wildebeestes and antelope. Thirty miles beyond Makindu we stopped at the station of Simba, which, being interpreted, means ‘Lion.’ It is in the heart of the lion country, and we saw several very ingenious lion-traps near the station. Two of our party went off for a long tramp while the train was at rest here, forgetting about the lions, and as they did not return till after sunset fears were entertained for their safety. But on their return they assured us that they had not met a specimen of King Leo’s tribe or even heard aught of his voice. Another fifteen miles brought us to Kibwezi, situated amid beautiful hills, and I longed for a camera to snap-shot a few of the glorious, verdure-clad ranges. At 9.30 at night we steamed into Nairobi, the railway head-quarters, 330 miles from Mombasa. After an hour’s halt for dinner in the vicinity of the station we started off on the last short nine miles to Kikuyu, which was reached at about midnight.

[...]

The third photo is a curious one and shows how in the tsetse-fly belt which extends for some 250 miles from the coast attempts are being made to prevent the enormous mortality among transport animals. As will be seen, the animals are attired in a complete suit, which I understand is only partially successful in keeping off the fatal fly. In the tsetse zone it is quite impossible for horses to live, but by the help of the railway animals are gradually being got up to the healthier districts of the interior.

The old ‘safari’ or caravan road runs parallel with the railway, and the next photograph (not included) shows a caravan on its way. The long line of native porters in Indian file is clearly depicted in this snap-shot. The natives are particularly fond of flags and drums, and with the latter keep up a continuous ‘tum-tumming’ as with their loads on their heads they march to and from the coast. Not infrequently the tired natives fall out en route, and when camp is pitched for the night the drummers do good service in scouring the vicinity for their missing comrades.

Some of the engineering difficulties connected with the construction of the Uganda Railway have been very great, and in many places tremendous gradients have to be negotiated. The highest of these summits is that at Mau, with an altitude of 8,300ft., whence there is a sheer drop of nearly 5,000ft. to the level of Lake Victoria. /
The next photograph (not included) is a view of the second highest point on the railway – the Kikuyu escarpment (7,500ft.) – and it also shows a rope incline which has been constructed temporarily so that the completion of the permanent line round the gradient may not be delayed. This temporary line is a most interesting piece of engineering work. In the photograph the ‘carrier,’ which is hauled by steel ropes, is just about to ascend to the summit with a loaded truck, which it will deposit on the more level line at the top, the whole being pulled up by a weighted truck coming from the summit, and which is easily discernible in the picture.

A peculiar interest attaches to the next photograph (not included). Equator Camp is some distance off the railway line, being in reality on the old caravan route, and situated some little way beyond the Eldoma Ravine Station. Although no positive observations have been taken, this is supposed to be the spot where the Equator crosses that part of the country, and the sign announcing the fact was erected by one of the officials. It is in the midst of a vast stretch of desolate and uninhabited country; and with the exception of an occasional passing caravan there is no sign of human life. Close by this notice-board is a clearing, which has been made on the site of a camp which has been used probably for hundreds of years by the old ivory traders.

In the letter I have quoted my friend speaks of the quantity of big game he saw from the track; and some of the photographs I have been permitted to reproduce will sufficiently indicate that the Uganda Railway passes through a country that is indeed a paradise for sportsmen. The great stretches of grass land are often literally covered by herds of game, and numbers of the animals approach fearlessly quite close to the trains. Instead of the cows and horses to be seen grazing close to the English railway the traveller on this great Central African line will see zebras, gnus, gazelle, hartebeest, jackals, ostriches, giraffe, and lion within easy distance of the rails. In the earlier days of the railway it was no uncommon thing for the train to be pulled up while the passengers alighted to have a shot at some lion or zebra that had strayed on the track.

[...] Rhinos, too, occasionally cause trouble on the railway. One day while running between Makindu and Tsavo stations the train crashed into one of these animals which was walking unconcernedly along the metals. As in the encounter between Stephenson’s engine and the ‘coo,’ the locomotive came off best, and the unfortunate rhino after getting pushed along the rails was caught, becoming entangled in the cow-catcher, whereupon the engine-driver got down and shot him. On another occasion the train ran into a herd of zebra on the Athi Plains, where these animals congregate in hundreds.

Sir Harry Johnstone, in a recent report, gives a graphic account of the big game to be met with on the Uganda Railway, and I cannot do better than give an extract from his despatch.
‘From Makindu,’ he says, ‘I travelled on through the night towards Nairobi. As the dawn diffused itself over the Athi Plains we saw from the windows of the train a rare and beautiful sight. These immense level stretches of grass land, reduced in the present drought to uniform grey-yellow stubble, were literally covered by herds of game, individuals of which would approach quite close to the line, as though they had already lost all fear of the rushing, jointed monster with the smoking head. We saw zebras as close as one might see horses grazing in the meadows along an English railway, and gnus were to us as cattle lazily flicking the flies off their haunches. Grant’s gazelle and Thomson’s gazelle would graze and merely lift their lovely heads as we rattled by. Hartebeestes faced us and shook their horns with mock indignation. Three or four giraffes, even, could be discerned on the sky-line, while pallah and oribi, wart-hog and jackals were things of no account. Ostriches were constantly seen, and I noticed a group of three very handsome males – black, with white plumes – in a dry stream-bed just as we were entering the precincts of Nairobi Station. The whole hour’s panorama of this wonderful zoological garden was like a sportsman’s dream, but the fact was we had been crossing the Athi Game Reserve, where some two years of strenuously enforced respect for the game regulations has brought about this wonderful collection of animals, so rapidly growing in confidence of the protection accorded them, that herds of zebra frequently gallop like runaway horses through the stretched-out township of Nairobi.’

In the early days of the railway construction the English guards and travellers are said to have done a good deal of indiscriminate shooting. The sum total of their shooting, however, was as nothing compared with the disastrous / organized raids of military officers travelling backwards and forwards to Uganda (and tales are even told of their good-natured desire that the passengers should share in these delights). The train was sometimes brought to a standstill, and the eager-faced guard would look in at a first-class carriage to say: ‘There is a fine rhino over there, sir, and I will give you a quarter of an hour’s stop if you like to go after him.’ In the interests of game preservation this is now, however, prohibited.

With so enormous a staff as that employed on the railway the medical needs are necessarily great, and in the picture given on the previous page we see the hospital which was established at Kibwezi, about 180 miles from the coast, for sick coolies. Wherever rail-head happens to be there is now always a flying hospital, chiefly consisting of tents, where both medical and surgical cases are treated.

The last photo. of this series shows how one of the steel boats which have been taken out from England in sections is being bolted together, preparatory to being placed on the Lake, a portion of which is also shown in the picture.

[...]
MEMORANDUM

– for –

THE PRIVATE ENTERPRISE COMMITTEE

by

THE HONOURABLE GIDEON MURRAY, MASTER OF ELIBANK.¹

During the past three years I have been studying the question of railway development in East and Control Africa and in 1920 was in this connection in close consultation with my Parliamentary colleague and friend, the late Mr. Henry Wilson Fox,² M.P., who at that time submitted comprehensive development proposals to the Imperial Development Committee (now defunct). I have officially resided in and have a knowledge in a business capacity of many parts of the British Empire, including South Africa, also of America. I venture, therefore, to lay before the Committee the following views and suggestions with regard to the questions raised in their Terms of Reference.

I understand that the Committee is interested particularly in the transportation problems in Africa and that to interpret the terms of reference the two main issues which the Committee are primarily considering are (a) whether the Railways, existing and future, should be under private or departmental control and (b) whether any future Railways should be constructed privately or departmentally.

The first issue is already very such complicated by the fact that the Railways in East, Control and West Africa are already under departmental control, and that around these Railways there has been built up a system founded upon the
Colonial Office Regulations which will be difficult to break through. To begin with, therefore, even if the Committee were to report in favour of the transfer of these Railways to private control the Colonial Office would, I expect, find themselves met by many cogent arguments in opposition on the part of the Governments concerned. I wish to emphasise this point, because it may have to be taken into consideration by the Committee. On the other hand, I hope that the Committee will not allow a point of this nature to influence their judgment in their final recommendations should they come to the conclusion on reasoned facts that the preponderance of argument is in favour of private, or partially private, control. The transition period of any transference of control in a large undertaking must necessarily be difficult and sometimes complicated, but should not be allowed to stand in the way of a practical solution.

In my view, Railways are always better and more efficiently administered when under private control. The Railway Staff and Officials under private control regard themselves as servants of the public. Under Government control they are apt to regard the public as their servants. This is principally due to the fact that under departmental control there is always considerable difficulty and usually a long delay in discharging an inefficient Official. Secondly, the Railway Staff and Officials have not the same inducement to make the Railway pay, not being dependent to the same definite degree upon the revenue of the Railway as they are when under private control. With government Railways any deficit on working is invariably made good by the taxpayer. With private Railways they must out their cost according to their cloth or otherwise go into liquidation. This leads to greater keenness on the part of all to increase the Railway’s earnings and efficiency. /

In a new Country development of local resources should go hand in hand with railway development. When a Railway is under private control the Company owning and administering it takes every possible opportunity of promoting the development of the local resources by assisting to find new markets, possibly in some cases by assisting to find Capital, in other cases by opening up lands and by promoting through-freights; and this they do by methods of enquiry and business connections which are open to no Government Department. The Canadian Pacific Railway is one of the best examples of the development of a country’s resources by private railway enterprise.

The reason why in the past in our Crown Colonies we have not seen the same degree of, and swiftness of, development as in the Dominions is due largely to the fact that the policy of development has been so cautious and so slow. In the Dominions and in South America if a Railway is required the Government concerned calls for Tenders, accepts a Tender, and the thing is put through at once, or else if the Government has not the necessary funds wherewith to pay for the railway construction themselves they offer to an individual or group a
concession under which the individual or group finds the money to build the Railway, and in return for this is given substantial reward in the shape of guaranteed interest on a substantial scale and grants of lands or minerals or both. In South America the guaranteed interest is never less than 6%.

On the other hand, what is the policy in our Crown Colonies? Usually the Colony is unable to find the funds for railway development. They then cast about for a concessionaire. Individuals or groups come to them or to the Colonial Office or to the Crown Agents and long and lengthy intricate negotiations ensue. The Colonial Government, the Colonial Office and the Crown Agents together in consultation will perhaps decide that they will grant a concession to build the Railway, but that the interest to be guaranteed for a term of years by the Colonial Government shall be 5% at the outside and that there shall be no guarantee of Principal and no concession of lands or any return for the risk which the Capitalist undertakes when he launches his money often into the midst of a virgin jungle. British Financiers, therefore, prefer to go to those Countries like South America where they can expect some ultimate return commensurate with the speculative risk of the outlay.

I would suggest, therefore, that in future where Colonial Governments desire railway development they should grant more generous terms both in the way of guarantee of principal and sinking fund and where the Principal is not guaranteed, of grants of land, together with their mineral deposits, upon freehold or long leasehold basis.

I am of the opinion that the construction of Railways where Government funds are available should be thrown open to competitive Private Tender. In my judgment a Government Department should not be allowed to tender for big railway contracts because, as I have already pointed out, speed is requisite and no Department as a rule has the means of carrying through a large contract quickly. Furthermore, how can a private firm tender upon equal terms with a Government Department. The Department is obviously in a superior position because if it breaks any conditions of the Tender it is only breaking its own conditions and there is no enforcement of penalty against it. Speed and efficiency in railway construction is especially desirable in the Tropics and this the private contractor can give. The Government Department cannot do so. There were some very interesting figures given in a leading article in the Morning Post of 18th, August, 1923, showing the cost of railway construction in West and East Africa and comparing the estimates of construction under a private or department system, and the times taken to construct by Government machinery.

Let me give two instances of this:

In the case of Uganda Railway, the cost of the railway was at first estimated at £5,600 per mile as compared with the estimate of £4,300 a mile supplied by
a private firm. The cost was actually £9,900 per mile and the time taken in con-
struction, instead of three to four years, was seven to eight years.

Take another case. The cost of the Gold Coast railway was double the official
estimate and amounted to nearly £11,000 per mile and three years were occu-
pied in completing 40 miles.

From what I have stated above the Committee will appreciate that I am in
favour of private construction and private control so far as possible. I admit that
Government control may be necessary in regard to supervision of freight rates.
Also if War took place power must be reserved for any or all Railways to revert
to Government control during that period.

I appreciate, however, that for various reasons complete private control may
not be realisable or practicable in Africa and that therefore endeavours should be
made to find a via media. I have in mind the example of the Anglo-Persian Oil
Co. which whilst administered entirely as a private Company has on its Board
Government Representatives and also Government Share Capital. I see a way in
which this principle might be applied to certain of the African Railways.

UGANDA AND BRITISH EAST AFRICAN RAILWAY
SYSTEM.

My suggestion in short is that a strong private Company should be formed, con-
sisting of a combination of several important Contracting and Shipping groups;
that the Uganda Railway, with its branch lines and including the Busoga and
Kampala railways and the railway now being constructed at Uasin-Gishu,
should be valued as they stand to-day; that these Railways should be handed
over to that Company at a Valuation agreed upon between the Government
and the Company; that the Valuation so arranged together with a certain addi-
tion for Working Capital be the declared Capital of the Company; that 40% of
the Capital be allocated free to the Imperial and Colonial Governments and
that the Company then should go to the public for the remaining 60% in the
form of Debentures, the Imperial Government guaranteeing a low rate of inter-
est thereon and repayment of principal. The Debentures so raised should be
secured upon the whole agreed value of the Railways. The Government share
of 40% would be paid to them in free ordinary shares. Of the capital thus raised
sufficient should be retained for Working Capital, the remainder to be paid to
the Imperial and Colonial Governments as purchase money for the Railways
required.

With regard to this purchase money, however, there should be this under-
standing, that it should be there should be this understanding, that it should
be utilised again as soon as possible and after careful investigation by the Gov-
ernment and the Uganda Railway Company upon further railway development
in British East Africa and Uganda – any Railway constructed out of such purchase money to be placed under the managing direction of the Uganda Railway Company upon financial terms to be agreed between the Government and the Company. The new Railway would in other words become a subsidiary of the principal Uganda Railway Company and would provide security for the additional raising of Capital for further construction.

I should, moreover, as in the case of the Anglo-Persian Oil Co., add two Government Representatives to the Board so that the Government may keep in close touch with the policy of the Company. The parent Company should have its headquarters in London with a Local Committee in British East Africa. / It would also be advisable to arrange that a Port Authority be established at the Port of Mombass, upon which should sit a Representative of the Government and a Representative of the Railway Company. This would enable the Government, Railway Company and the Port to work in close co-operation, although I should prefer to see the Port directly administered by the railway authority.

**TANGANYIKA RAILWAY SYSTEM.**

Whilst in the case of the Uganda Railways a net annual profit is now shown which therefore makes my foregoing proposals immediately financially possible, the same does not apply to the railway system of Tanganyika, and therefore, in that territory, at any rate in the meantime, different action would be necessary.

The mainline railway running from Dar-es-Salaam to Kigoma shows at present a heavy annual loss and so far a I can judge this loss will continue until this line, which is the main artery of Tanganyika and East Central Africa, is supplied with feeders opening up the rich territories near and around the adjacent Lakes. It would therefore seem desirable for the Government to press on new railway schemes with that object.

Those most important in my opinion would be a railway connecting –

(a) Lake Nyasa with Lake Tanganykia, 200 miles in length (Mwaya to Kasanga) with a small extension from Kasanga to Aberoon, about 30 miles. This would open up a most fertile part of Central Africa and add to the world's food supplies in both beef and cereals. It is a country that has hitherto been untapped, and also a part of the country in which I understand Europeans could live in comfort.

(b) Lake Tanganyika with Lake Kivu, about 60 miles in length, along the Rusisi River Valley, opening up another very fertile area and incidentally bringing nearer the territory of Ruanda, alleged to contain some two to three million head of cattle, sheep and goats, and thickly populated with an industrious people.
(c) Mwanza, on the southern end of Lake Victoria-Nyanza with Tabora (on the main Dar-es-Salaam line about 200 miles east of Lake Tanganyika) about 190 miles in length.

(d) Kelossa (situated on the main Dar-es-Salaam railway about 150 miles from Dar-es-Salaam) south-west through rich territory with the north end of Lake Nyasa, a distance of about 250 miles.

Another projected railway is that of Tabora in a north-eastern direction to Kasseke on the edge of the Ruanda country between Lakes Kivu and Lake Victoria-Nyanza. There has, however, been considerable controversy regarding this railway both as to route and point of terminus, and I do not bring this into the scheme for the moment although ultimately I think it is clear that a railway will have to be built somewhere in that direction.

There are two possible methods under which these railways might be financed and constructed;– Either the Imperial Government could provide the necessary funds for their construction in the same manner as they did for the Uganda Railway and that they be constructed by private contract; or else a private company might be formed for this purpose, which would go to the London money market for the necessary funds with an Imperial guarantee as to interest and principal for a period of say 30 years or instead of guarantee of principal the company might be granted concessions of lands and minerals upon a freehold or long leasehold basis alongside the railway lines.

In any event, I would suggest that a private company, with government representation, similar to that which I have proposed for the Uganda Railway, should be formed in connection with Tanganyika to administer all the railways of that territory. In the case of the main Dar-es-Salaam Railway this Company should act as managing directors, receiving agreed payment for this service, for obviously the present financial circumstances would not admit of this line being taken over entirely by any private company unless guaranteed by the Government both as to principal and interest, until such time as it showed sufficient profit to pay its own way.

CO-ORDINATION OF RAILWAY SYSTEMS OF EAST AND CENTRAL AFRICA.

Some form of co-ordination for the purposes of policy between the two railway systems of British East Africa and Tanganyika is obviously desirable, but I am not at present prepared to make any recommendation on this point.
IMPERIAL DEVELOPMENT OF RAILWAY SYSTEMS.

Finally, I would like to submit this recommendation. I believe that the time has come when the Imperial Government should consider, very seriously indeed, the more speedy development of their large central and East African tropical possession. Such development, however fast, must necessarily take considerable time and a generation passes very quickly when development on this large-scale nature is proceeding. During the late Great War Central Africa was useful, even with its present small degree of development, in assisting the food supplies of the world, especially by export to India. If there is ever another war the food supply position is likely to be more complicated and difficult even than in the last. Central Africa contains enormous food resources only awaiting development. I venture to go so far as to say that it is the duty of the Imperial Government to take every reasonable measure to develop those resources.

It should, moreover, not be overlooked that where railway construction is concerned, much employment can be given in Great Britain, and so the Government could with domestic advantage also initiate a bold policy in connection with the development of African transportation and of transportation in her other Crown Colonies. Legislation might be introduced to enable the Government to borrow on the London market up to fifty million pounds for that purpose, as and when it is required. When we remember that in the past three years we have spent £400,000,000 in hard cash in unemployment benefits to the workless in this country and that our national debt is some £8,000,000,000 to-day, 50 or even 100 millions for the Imperial purposes outlined in this memorandum seems a mere bagatelle, especially as a very great percentage of it would come back to the unemployed in this country and create good profitable employment of a reproductive nature.

I venture to hope that this memorandum may be of some service to the Committee and I shall be very glad to elaborate any of the points in it should it be possible for me to arrange a meeting with them.

[...]
When the British South Africa Company first took over the administration of the country, the nearest centre of railway communication was Kimberley. Appreciating the importance of keeping in touch with Cape Colony, and of having railway connection with a British port through British possessions, one of the first steps which the Rt. Hon. C. J. Rhodes took after the Charter had been signed, was to obtain permission to extend the Cape Government’s railway from Kimberley to Vryburg in Bechuanaland. The extension was begun in November, 1889, and was opened to Vryburg in December, 1890, the distance (126 miles) having been completed in a little over a year.

Before extending the line northwards from Vryburg, it was deemed expedient that a separate Railway Company should be formed, and the Bechuanaland Railway Company was accordingly incorporated in May, 1893, in which month the extension was begun. The line was gradually pushed on through Mafeking, Palapye, and Francistown, until on the 19th October, 1897, it reached Bulawayo, which, from being the head kraal of Lo Bengula in 1893, had by this time become an important and thriving township.

The urgency of having railway communication right through to Bulawayo was intensified firstly by that fatal cattle disease, the rinderpest, which denuded the country to a very large extent of its means of transport, and secondly by the
Matabele Rebellion which broke out in the beginning of 1896, during the worst period of the cattle epidemic.

These two causes hastened on the completion of the Railway to such an extent that the last 228 miles from Palapye to Bulawayo were completed in the incredibly short space of four and a half months; and taking into consideration the fact that all the railway material had to be carried over a single line, on which for the greater part of its length a large amount of additional traffic had to pass, it must be admitted that this achievement was a triumph of railway building.

Thus the iron horse reached Bulawayo, and the formal opening of the line on the 4th November, 1897, at which a large gathering of distinguished and influential visitors was present, will always be remembered as the birthday of a new epoch in the history of Matabeleland.

Whilst the Bechuanaland Railway Company (now known as the Rhodesia Railways, Limited) was bringing the line up from the South, railway construction was also being carried out in Mashonaland, the Eastern portion of Southern Rhodesia. Salisbury, the capital of Rhodesia, being less than 400 miles from the coast, was naturally anxious to obtain railway connection with the Portuguese port of Beira as soon as possible.

In spite, however, of the comparatively short distance over which the line had to be laid, there were many obstacles in the way of constructing it.

In the first place, the country from Beira inland for about 200 miles belonged to Portugal, and though in 1891 a treaty was made between that country and Great Britain, in which the former agreed to construct, or cause to be constructed, a railway from the Pungwe River to the British sphere of influence (Rhodesia), it was not until the right to construct this line had been handed over by the Portuguese Government to the Mozambique Chartered Company, by this Company to Mr. Van Laun, and by Mr. Van Laun to the British South Africa Company, that through them the Beira Railway Company was finally formed.

Another more serious obstacle to the actual construction of the railway was the nature of the country through which it had to pass. To say that the altitude steadily rises from sea level until only 330 miles from Beira it reaches 5,600 feet, gives only a faint idea of the sort of difficulties with which this little Pioneer Railway Company had to contend.

Fontesvilla, 35 miles up the Pungwe River, was the spot chosen as the starting point of the line, which was of a two-foot gauge, and from here the first section was laid in a westerly direction for a distance of 75 miles, and was opened in October, 1893.

For the first few miles, across what are known as the Pungwe Flats, the actual laying of the rails was not a difficult task, in spite of the frequent washaways that occurred; but in such a low-lying and swampy country, situated within the Tropics, the awful ravages of malarial fever worked terrible havoc amongst
the construction parties. Slowly but surely, however, the work went on, and in November, 1894, the line was opened to Chimoio, a distance of 118 miles from Fontesvilla.

As Chimoio continued to be the railhead for some years, it may not be out of place to give a short account of the line as it then existed.

Nobody who travelled to Salisbury via Beira in those days, can forget the excitements, the diversions and eccentricities, not always delightful, in which this curious little railway indulged; but, primitive though the railway no doubt appeared to one only accustomed to English travel, no one could have heard the shrill whistle, or seen the puff of real train smoke rising above the malarial mist on the banks of the Pungwe, at 6 o’clock in the morning, without experiencing a joyful thrill in the thought that, in spite of all his previous hardships, in spite of his two or three hours’ rest on some mud bank up the river the night before and his subsequent introduction to ‘all the comforts of a modern Hotel’ at Fontesvilla, he had at length regained a portion of that civilization which he seemed to have cast off for ever when he left the boat at Beira.

In Mr. Leo Weinthal’s Guide Book ‘Round Africa,’ Beira is described in 1902 as ‘one of the bleakest places on the whole East Coast,’ and its streets as being in a ‘disgraceful state.’ This is as it may be, but nevertheless Beira might almost be called a paradise to-day, compared with what it was in the days when the Fontesvilla-Chimoio Railway was opened.

At that time it was nothing but a narrow strip of sand, the monotony of which was only relieved here and there by a low galvanized iron house, an evil-looking kiosk or drinking saloon, and a so-called hotel. To-day it has got streets, and its streets are paved on either side throughout the town. Then, so far from having pavements, the barren waste spaces of sand between the houses could not even be honoured with the name of streets. The ‘Upper Ten,’ or probably less, had their own private bogey carriages / which were pushed by natives along tiny tramway lines, but the rest of the inhabitants had to plough through the sand as best they could.

Gladly did the traveller turn his back on Beira, and face with alacrity the little steam launch on the Pungwe River, on which, to distract his attention from gloomy thoughts, he could usually interest himself while the daylight lasted, in watching the monkeys playing in the forests, whilst every now and then a gaping crocodile would glide from the muddy bank into the water, and in the distance could be discerned the snout of a great hippopotamus.

Not so interesting did he find the situation when the night had fallen, and the steam launch, as was often its wont owing to the shifting of the river channels, had unceremoniously landed him on a bank of sand or mud; and when it finally reached its destination late at night, the traveller might well have wondered by what strange chance the name of Fontesvilla had been given to it. Surely the Por-
tuguese Dom who christened it must have been akin to the Muses themselves, that he found scope for his poetic fancies in such an abandoned spot, and could picture fountains playing through the poisonous reeds of that miasmic swamp!

In short, the traveller found in Fontesvilla an infinitely worse place than Beira, and it is not surprising that he hailed with delight the little railway train which was to carry him far away from such dismal surroundings, towards the higher and purer altitudes of Mashonaland.

The discomforts of that railway journey were speedily forgotten in the joy of being once more in a train, and in the new and varied excitements which the stranger found everywhere along the line.

He heeded not that his favourite rug, which had so often reclined in safety on the rack of an English railway carriage, was being steadily reduced to ashes by the sparks from the wood fuel, which for many years had to do service for coal, whilst he watched, with all the joyous wonder of a child first visiting the Zoological Gardens, zebras, buffalo and eland, and many other strange and beautiful animals in all the wildness of their natural freedom.

Time was no object in those old days, and it was not considered unusual for the engine driver or guard to stop the train occasionally, in order to bag a brace of partridges, or risk a shot at a wandering lion, who, with all the proud indifference that might be expected from the Lord of the Forest, shewed very little respect for the Beira Railway Company.

A great many stoppages were inevitable, for besides the halts for fuel and water, the gradients at some points along the line were so steep that the little engine had sometimes to make several attempts before it reached the top, and before each attempt it would go back a little way and wait until it had accumulated sufficient steam to make it worth its while to try again. Up some of the worst of the zigzag ascents the services of natives had even to be employed, whilst the traveller himself would perhaps be requested to take his share in the performance by walking before the engine and throwing sand on the rails.

The 118 miles were travelled in anything from 18 to 30 hours according to the diversions en route though it must be admitted that very liberal time was allowed for dinner at the 80 mile Peg. Still, no one who travelled by that first railway could complain that he had not been given sufficient time to observe the scenery, which, whether flat or mountainous, wooded or bare, cannot fail to attract through the mysterious charm of its unbounded wildness. The only regret he could have felt was that the railway line did not go farther; for a coach journey, except apparently in the 'good old coaching days,' is as a rule a most uncomfortable experience, the more so when one does not know for how many days and nights one may have to endure it; and, when coaching in the rainy season, this is always an open question.
On the 29th October, 1896, railway connection was opened between Beira and Fontesvilla by the Beira Junction Railway Company, and in 1897 the Mashonaland Railway Company was formed for the purpose of constructing a line of a 3 ft. 6 in. gauge from the border of the Portuguese territory to Salisbury. Owing to great survey difficulties the small gauge line of the Beira Railway Company was not opened from Chimoio to the border until February, 1898, and in the meantime the Mashonaland Railway Company had entered into a contract with the British South Africa Company, whereby the latter agreed to construct the broad gauge line to Salisbury, and provide the necessary funds. Work was begun on the 11th January, 1898, and the line was completed in May, 1899.

The Beira Railway being only of a two-foot gauge, considerable delay and expense were entailed in transferring goods at Umtali from one line to the other; also, owing to the narrowness of the line, only a limited amount of traffic could be passed along it. It was therefore decided to widen the line to the standard gauge of 3 foot 6 inches, and the work was completed and handed over on the 1st August, 1900, on which date also an arrangement came into operation for the working of the entire system from Beira to Salisbury under one management. Before laying down the broad gauge between Beira and Umtali, the line was partly re-surveyed, with the result that some of the worst gradients were avoided, and a saving of 18 miles in the whole distance was effected. From this date the line has been steadily improved; coal has, to a large extent, superseded wood, and the corridor carriages are as comfortable as anyone could wish them. True, some of the excitement of the old time have disappeared, but these things must always happen with the advance of civilization.

It is between Chimoio and Umtali that the most beautiful mountain scenery is found, especially in Manicaland, where the little Portuguese township of Massikessi and the Revue River are particularly mention; whilst the approach to Umtali through the Christmas Pass is one of the most perfect pieces of scenery imaginable.

Though none of the mountains seem to be individually high, owing to the altitude of the whole country, they nevertheless have a peculiar grandeur of their own; and the view round this portion of the line, particularly if seen on one of those evenings when the silver glory of a tropical moon blends with the last rays of the setting sun, whilst distant veldt fires, slowly creeping up the mountain sides like fiery centipedes, add weirdness and wildness to the scene, is quite beyond all description.

The site on which the township of Umtali is steadily growing is one of the prettiest that could be found throughout the country. It is entirely surrounded by hills, some of great beauty and magnitude, and the colouring of which the artist would find it difficult to faithfully depict. If the traveller has sufficient time
to spare, the park at Umtali, with its little river now running past banks of rich green sward, now breaking into tiny cascades, is well worth a visit.

After leaving Umtali the hills become more scattered, and the great rugged clumps of granite boulders, one of the most characteristic features of Mashonaland scenery, gradually appear. The marvellous formation of these clusters of rock, interspersed with trees and undergrowth, cannot fail to attract the stranger’s attention. Their picturesque irregularity, the extraordinary and fantastic positions which these great boulders have taken, some appearing to be hardly balanced, so easy does it look to push them over with one’s hand, make it seem as though in the bygone ages they must have been the playthings of some Her-culean race.

Whatever the origin of their formation, and it is generally believed to be the result of the heavy rains which for thousands of years have washed away the land around them, they proved very formidable and often impenetrable strongholds for the Mashonas, who were quick to take advantage of these natural strongholds, both against the Matabele who used to raid their cattle and carry off their women from the lands, and against the white men during the rebellion in 1896.

The highest point on the Beira-Salisbury Line is Marandellas, 45 miles from Salisbury, where there is a good hotel. The altitude is 5,600 feet, and from this point there is a gradual descent into Salisbury, which is situated about 4,800 feet above sea level.

The principal rivers spanned by the line between Umtali and Salisbury are the Odzi and the Ruwa, each about 12 miles from these respective townships.

Though there is plenty of bush country all along the line the nature and the size of the trees alter considerably as one rises to the plateau of Mashonaland; the tropical vegetation is left behind, and the larger trees disappear.

Salisbury, the capital of Rhodesia and the seat of the Government, has a white population of nearly 2,000. There are some good buildings, notably the Administrator’s Office, Victoria Memorial, Volunteer Drill Hall, Town House and Standard Bank. There are Churches and Schools, several Hotels, Clubs and Boarding Houses, a Public Library, and many excellent shops. A large and attractive park has been tastefully laid out, and it seems almost miraculous that what but a few years ago was dry and barren veldt, is now a profusion of flowers of all kinds, trees and grass lawns.

The usual amusements of a British colonial town – sports, dances, racing, concerts, etc. – are freely indulged in.

Having described the building of the railway from the East to Salisbury, let us see what improvements and extensions have been made in the West by the Rhodesia Railways, Limited.
It has been shown how in 1897 the line from the South reached Bulawayo, more than eighteen months before Salisbury had railway communication; and in consequence of this, the former township, though three years younger than Salisbury, very soon exceeded it in population, and in the number and size of its buildings.

Some of these for such a young town are exceedingly handsome and costly, those built with the red stone which is quarried in the neighbourhood being particularly imposing.

Owing to heavy working expenses, granite, which is found in large quantities throughout Rhodesia, has hitherto been utilized only in building bridges, and in making foundations, etc. Doubtless, if the Romans had colonized Rhodesia, the Pioneers in ’89 would have found whole cities of this imperishable stone scattered over the country, but labour must have been plentiful and labour questions scarce ‘in the brave days of old.’

Notwithstanding modern difficulties, however, the Roman Catholics at Bulawayo recently opened their new church, which is being built entirely of granite. Although little more than the centre nave has been completed – the church will eventually be cruciform – it is already an imposing structure, the massive stone giving full justice to the early Gothic style of architecture, in which it is built.

In 1898 Mr. Rhodes formulated a scheme for the extension of the main trunk line from Bulawayo, via Gwelo, to the Zambesi, and thence to Lake Tanganyika. One of his great ambitions was that railway communication from the south would gradually join that from the north, so that finally a Cape to Cairo Railway would become an accomplished fact. He endeavoured to obtain the co-operation of the Imperial Government to this important undertaking, but without success. The various mining and exploration companies were then approached, and sufficient funds for the construction of the first section of about 150 miles were at once obtained. At the same time it was decided that whilst the railway was being pushed northwards, via Gwelo, a line was to be built from Salisbury to meet this extension.

The line from Bulawayo to Gwelo was begun on the 30th of May, 1899, and the work of construction was progressing rapidly when the Transvaal War broke out. Owing to the impossibility of obtaining the permanent way for carrying material and stores from the south, the contractors were obliged to suspend work.

The Directors of the Rhodesia Railways, Limited, then decided to extend the railway from Salisbury so as to meet the line from Bulawayo, and by the 1st of June, 1902, the 188 miles from Salisbury to Gwelo were opened to the public. It is worthy of notice that this line was built whilst the Boer war was raging on the borders of Rhodesia, and at a time when all the supplies for its inhabitants,
in addition to the requirements for the commissariat and transport of a large force of Imperial troops, had to be carried on the single line from Beira to Salisbury. After peace had been proclaimed it gradually became possible to utilize the Southern line for the transport of railway material. The construction of the line from the Bulawayo end was proceeded with and on 1st December, 1902, only six months after the line from Salisbury to Gwelo had been completed, Cape Town and Beira were connected by rail.

An arrangement has now been made with the Cape Government Railways, under which circular tourist tickets, available for one month, are issued for all stations on the Cape and Rhodesia Railways. It is also proposed to provide saloon carriages, which will be hired out for one month or longer, to persons wishing to visit the chief objects of interest in South Africa, at a charge which will include catering. These facilities will be granted over the whole of the South African Railway system, and will no doubt attract travellers and shooting parties, since the saloon so hired will be taken to any part of the system, and kept for as long as desired in a siding, thus forming the headquarters of the party. / 

The accommodation provided on the ordinary passenger trains in Rhodesia is the same as that on the Cape Government Railways, whilst the Train-de-Luxe, which at present carries the oversea mails once a week, in each direction, between Cape Town and Bulawayo, is fitted up for the comfort of its passengers in as luxurious a style as any of the first class saloon trains in England or on the Continent. This train contains dining and sleeping cars, an observation car and lounge (in which is a writing table and a small library of handsomely bound books at the disposal of the passenger), a card room, kitchen, pantry, lavatories and bathrooms. The dark red leather upholstery, the handsome oak panelling and white metal fittings in which the whole of the state-room accommodation has been tastefully carried out, give an air of solidity and comfort which one seldom expects to find except in a first-class hotel or on one of the large Ocean Liners, and which has / certainly hitherto never been approached in Africa. Though the train itself was not built at the time of Mr. Rhodes’ death, the Railway Company hastened on the completion of one of its saloon carriages, which was used to convey his body to Bulawayo. Since then the train has been placed at the disposal of their Royal Highnesses the Prince and Princess of Wales on the occasion of their visit to South Africa, and has subsequently become famous as the travelling home of the Right Hon. Joseph Chamberlain during his recent tour through the country at the conclusion of the war. /

The country through which the line first passes on leaving Bulawayo will always be memorable as being the opening scene of the Matabele Rebellion in 1896, when men, women and children were treacherously murdered in their homes in all the outlying districts of Bulawayo, and in most of the wayside inns along the old coach road, near which the Railway runs.
As the train crosses the Shangani River one cannot help recalling the heroic stand made by Major Alan Wilson and his gallant companions in their attempt to capture Lo Bengula in 1893, an example of such great coolness and fearlessness in the face of certain death, that even the Matabele themselves were amazed at it. It is by such mournful though glorious incidents that the progress of our race has ever been marked, and it is by such brave men as these that the British Empire is being built. In the Matopos, near Mr. Rhodes' grave, there has been erected a memorial to the heroes of the Shangani, and, as desired by Mr. Rhodes, and with the consent of their relations, the remains of these men have now been laid to rest in that unique and beautiful burial ground, in which only those who have deserved well of their country are to be interred.

Between the Shangani and Gwelo the line passes through the Somabula Forest, and throughout the whole of Matabeleland the country is more thickly wooded than Mashonaland.

Gwelo is a rising township in the centre of some of the best gold producing country, so far as is yet known, in Rhodesia. Besides several hotels and stores, there is an English Church, a school, a good club, a race course, and a small river on which regattas are sometimes held.

Twenty-two miles from Gwelo is the Globe and Phœnix, one of the principal gold mines in the country. Shortly after leaving the station the line crosses the beautiful Sebakwe River, which forms a portion of the boundary between Mashonaland and Matabeleland.

The next place of importance along the route is Hartley, situated 111 miles from Gwelo and 77 from Salisbury. Hartley has been laid out as a township and already possesses besides several stores, a well-built hospital, a Magistrate's house and Government Offices. There are many gold mines in the vicinity, and the country round is a favourite hunting district, game of all sorts being very plentiful. It used to be noted for buffalo also, but, owing to the dangers of the tsetse fly which is always found in the neighbourhood of these animals, they have been gradually shot out or driven away.

The little station of Norton at the Hunyani ‘Poort,’ or opening in the hills through which the river flows, is the last on the line before the capital is reached. It is a lasting memorial to the family who first occupied the adjoining farm. When the Mashonas, at the instigation of the Matabele, rose in rebellion in June, 1896, Mr. and Mrs. Norton, their little child and an English nurse were amongst the first victims of their cruel and cold-blooded murders.

If railway communication conferred no other blessings on the country than that of preventing to a large extent the recurrence of similar horrors in the future, the money spent on their construction could never be said to have been thrown away.
It has been previously stated that the original intention of the Rhodesia Railways, Limited, was that the line from Bulawayo should branch off at Gwelo towards the North, traversing the Mafungabusi district and crossing the Zambezi River near the Kariba Gorge.

It was found, however, after further examination of the proposed route, that, if the Zambezi were crossed at this spot, very heavy expenditure would be necessary owing to the nature of the country north of the river being exceptionally difficult for railway construction. The Directors of the Rhodesia Railways, Limited, accordingly decided on another route farther to the westward, starting from Bulawayo instead of Gwelo, and passing through the vast timber forests in the district of the Gwaai River, through the great WANKIE coal area, and so on to the Victoria Falls, proceeding thence through North-Western and North-Eastern Rhodesia to Lake Tanganyika.

On 9th May, 1901, the construction of the line was begun, and by 21st September, 1903, it was opened to WANKIE, a distance of 200 miles from Bulawayo. After running parallel with the Khami River for several miles, the line crosses the Insese and the Umguzo rivers, and enters the great forest district which stretches from the Gwaai River for many hundreds of miles to the North, and as far as the Shangani to the East. It is curious that on the west bank the formation of the country is entirely different, for on this side for hundreds of miles there are great sandy plains, broken here and there by salt pans and numberless little vleis or water pools, and in the rainy season covered with a poisonous weed which is deadly to horses and cattle.

The most valuable timber found in the forests is mahogany, teak, and mopani. The teak is a very handsome wood, hard and close grained, and of a somewhat redder colour than American teak. It takes a beautiful polish and some excellent furniture has been made of it in Bulawayo. Sir Arthur Lawley,1 who was at one time Administrator of Matabeleland, in an article which appeared in 'Blackwood’s Magazine'2 in 1898, describes the peculiar shape of the mopani trees3 in this part of the country. Their trunks are usually straight and are largely used in timbering mines, but here they have been twisted into strange fantastic shapes through having been torn and trampled upon, when saplings, by elephants which not many years ago roamed in herds all over the district. The forests still abound in game of all sorts, and the country is therefore good, or some people may think bad, for lions also, but they, like the elephants, are being driven farther away by civilization. The more humble hunter can always get as much pheasant and guinea fowl shooting as he likes.

The railway crosses the Gwaai River at a spot about 90 miles from Bulawayo. The altitude here is 3,240 feet, or about 1,200 feet lower than that of Bulawayo; the vegetation has in consequence a more tropical appearance.
From this point the line leaves the Gwaai River, which makes a big horseshoe bend, and traverses a stretch of sand plains for many miles until, before reaching Wankie, it once more runs parallel with the river.

Wankie, called after the name of the native Induna of the district, is a vast coal area, which promises to be one of the most important discoveries in Rhodesia. The many advantages which a local supply of good coal will confer upon every branch of industry in the country are obvious, and on high authority Wankie coal is considered to be second only to the best Welsh, whilst its supply is apparently inexhaustible.

Between Wankie and the Victoria Falls the country becomes more hilly. The railway over this distance, about 75 miles, was completed on the 25th April last.

Of the branch lines in Rhodesia the longest is that between Bulawayo and the Gwanda District, which is being constructed to open up the gold and coal fields to the south-east of Bulawayo. The line was begun in 1899, but work was stopped on the outbreak of the War. In March this year it was opened to Gwanda township (91 miles), and 13 miles more have to be completed. A branch line was opened last year from Gwelo to Selukwe, a distance of about 22 miles. Selukwe is a rapidly growing township in the centre of one of the largest gold mining districts in the country.

A railway is also to be made from Salisbury to the mining district around the Mazoe Valley. The survey has already been completed. The road between Salisbury and the Mazoe, about 26 miles, will always be remembered as that along which Captain Randolph Nesbitt, V.C., and his brave patrol fought their way back in 1896, after rescuing from the hands of the Mashonas the little band of men and women who had been subjected to such terrible dangers and privations in their improvised laager at the Alice Mine.

In August, 1902, a two-foot gauge line, the property of the Ayrshire Gold Mine and Lomagunda Railway Company, was opened between Salisbury and the Ayrshire Gold Mine, which is one of the most promising propositions in Mashonaland. The mine is about 84 miles from Salisbury, by rail.

It is also contemplated to build a line to Zimbabwe, near Victoria, which will give visitors a chance of seeing some of the oldest and most curious ruins in the world.
An Agreement made the day of 1897 Between SIR MONTAGU FREDERICK OMMANNEY K. C. M. G. ERNEST EDWARD BLAKE Esq.¹ and MAU- RICE ALEXANDER CAMERON² late a Major in Her Majesty’s Corps of Royal Engineers all of Downing Street in the City of Westminster the Crown Agents for the Colonies (who and the Crown Agents for the Colonies for the time being are hereinafter referred to as ‘the Crown Agents’) acting for THE SECRETARY OF STATE FOR FOREIGN AFFAIRS on behalf of HER MAJESTY’S GOVERNMENT (hereinafter referred to as ‘The Government’) of the one part and (hereinafter called ‘the Contractors’) of the other part.

Whereby it is agreed between the said parties hereto as follows that is to say:–
1. If the Contractors within calendar months from the date of this Contract at the expense in all things of the Contractors or of the Company to be formed as hereinafter mentioned shall procure to be formed and registered under the Companies Acts 1862 to 1893 a Company (hereinafter called ‘the Company’) with the object inter alia of entering into and carrying out such Contract as is hereinafter mentioned and with Articles of Association containing provisions to the effect that the Company shall not borrow or raise any money except in the manner to the extent and for the purposes specified in the Contract hereinafter mentioned and if the Contractors shall prove by the statutory declaration of the Secretary of the Company and otherwise to the satisfaction of the Crown Agents that the share capital of the Company to the extent of the prescribed sum has been bond fide subscribed so as to be payable in cash by responsible persons within a reasonable time and that such arrangements have been made as in the opinion of the Crown Agents shall be sufficient to / ensure both that the full nominal amount of the said capital so subscribed to the extent of the prescribed sum will as and when received be without any deduction whatever paid into a separate account at the Company’s bankers entitled ‘The Central Africa Railway Account’ and that such account can and will only be drawn upon by drafts signed by a Trustee or Trustees (who shall be nominated for that purpose by the Company and approved by the Crown Agents) and countersigned by the Crown Agents and only for the purposes hereinafter mentioned free from any charges or liabilities whatever in respect of the formation of the Company or any other matter whatsoever and shall procure the Company to execute and deliver to the Crown Agents a Counterpart of the Contract hereinafter mentioned and shall pay to the Crown Agents on behalf of the Government the sum of £10,000 as and for the guarantee mentioned in such Contract then the Government by the Crown Agents will enter into a Contract with the Company in the terms of the draft Contract set forth in the Schedule hereto.

2. The expression ‘the prescribed sum’ shall mean such a sum as shall be fixed by the Certificate in writing of the Government Engineer in the said Contract mentioned after the Survey now being made or now about to be made of the Railway mentioned in the said Contract shall have been completed as representing the estimated cost of constructing and equipping the said Railway and all works connected therewith in accordance with the provisions of the said Contract and in fixing the amount of the prescribed sum the Government Engineer shall allow in addition to the amount obtained by the pricing of the actual quantities such provision for unforeseen contingencies as he may consider necessary not exceeding £10 percent.

3. The prescribed sum shall be applied in or for the purpose of the construction or equipment of the said Railway and Works or for the acquisition of the land required therefor or for any other purpose which the Crown Agents or
the Government may deem incidental to any of the above-mentioned purposes according to proper certificates of the said Government Engineer of the value of the work for the time being executed or materials or equipment or land (other than lands given by the Government) provided by the Company on or in connection with the said Railway and Works. After the cost of constructing and equipping the said Railway and Works and of all matters incidental thereto shall in the opinion of the Crown Agents have been fully paid the residue (if any) then remaining of the prescribed sum shall be paid or transferred to the Company or otherwise dealt with as the Company shall direct.

4. The prescribed sum shall also be subject to the provisions contained in the said Contract with respect thereto in the event of the Company making default in the performance of the said Contract.

5. Every statement representation or reference to this Agreement or to the said Contract to be set forth in any prospectus notice advertisement or circular to be issued by or on behalf of the Contractors or the Company shall together with the whole of the documents containing the same be first submitted to the Crown Agents before such prospectus notice advertisement or circular shall be issued and the same shall not be issued if the Crown Agents shall within seven days after any such prospectus or other document shall be submitted for approval serve on the Contractors notice disapproving of the same. And in the event of any breach of the present Clause it shall be lawful for the Crown Agents by notice in writing served upon the Contractors to determine this Agreement.

6. Every approval or notice to be given or served by or on behalf of the Government or the Crown Agents may be given by writing signed by the Commissioner for the time being of the British Central Africa Protectorate or by one of the Crown Agents.

7. The Contractors will on the execution of this Agreement pay to the Crown Agents all costs charges and expenses incurred by them in or about the negotiation preparation approval execution and printing of this Agreement.

In Witness whereof the Crown Agents and the Contractors have hereunto set their hands and seals the day and year first above written. /
Majesty’s Government of the one part and THE COMPANY LIMITED (hereinafter called ‘the Company’) of the other part

Witnesseth that in consideration of the benefits and advantages to be derived by the Government and the Protectorate from the construction of the Railway and Works hereinafter mentioned and from the working of such Railway and in consideration of the mutual stipulations and obligations hereinafter contained the Government do hereby grant unto the Company the right to construct and work one line of Railway between the points hereinafter mentioned as the points of commencement and determination of the Railway hereinafter described the general route and direction of such Railway being shown on the plan hereunto annexed (hereinafter referred to as the annexed plan) subject to the covenants conditions agreements and provisions hereinafter contained.

And this indenture further witnesseth that for the consideration aforesaid the Company so far as the stipulations and agreements hereinafter contained are to be performed and observed by them do hereby for themselves their successors and permitted assigns covenant and agree with the Government and the Government so far as the said stipulations and agreements are to be performed and observed by the Government and so as to bind the Government / but not so as to impose any personal liability on any Member thereof do hereby covenant and agree with the Company their successor and permitted assigns as follows that is to say:—

1. In this Contract the following expressions or terms shall have the following meanings respectively:—

(a) ‘The Protectorate’ means the British Central Africa Protectorate.

(b) ‘The Government’ means and includes Her Majesty’s Government and the Secretary of State for Foreign Affairs for the time being thereof or other the Official for the time being administering the Government of the Protectorate.

(c) ‘The Commissioner’ means Her Majesty’s Commissioner for the time being of the Protectorate or the person for the time being acting as such.

(d) ‘The Crown Agents’ means the person or persons for the time being authorised to act and acting as Crown Agents or Crown Agent in England for the Protectorate.

(e) ‘The Railway’ means the Railway hereinafter described together with all Works and conveniences to be made in connection therewith.

(f) ‘The Government Engineer’ means (1) so far as regards matters and works in the United Kingdom the Engineer for the time being appointed by the Crown Agents to act in the United Kingdom for the purposes of this Contract and (2) so far as regards matters and works in the Protectorate the Engineer for the time being appointed by the Government to act in the Protectorate for the purposes of this Contract.

(g) ‘Month’ means calendar month.
2. Subject to the provisions of this Contract the Company may and shall with due diligence and expedition construct to the satisfaction of the Government and make ready and fit and equipped for being opened for the public carriage of passengers, animals and goods throughout within the time hereinafter prescribed.

(a) A Railway wholly in the Protectorate commencing at the terminus station to be situate at such point as may hereafter be fixed by the Government Engineer at Chiromo and thence proceeding to Blantyre and on to Lake Nyasa where it shall terminate at such point on the said Lake as may hereafter be fixed by the Government Engineer the general course of the Railway on land being shewn on the annexed plan and marked thereon with dotted lines but the whole route thereof shall be subject to the approval of the Government Engineer.

(b) All such necessary sidings passing places, stations, lights, offices, engine houses, goods and cattle depôts, turn tables, signals, signal cabins, telegraphs and other works (including suitable landing places, piers, wharves and other conveniences and accommodation at the terminus of the railway both at Chiromo and at Lake Nyasa) as in the opinion of the Government Engineer shall be necessary for the due and efficient maintenance and working of the Railway and for the connection of its traffic with the water-borne traffic at Chiromo or on Lake Nyasa.

(c) All such necessary under and over bridges and level crossings accommodation roads, approaches, cattle creeps, water courses, drains, culverts and other works as may in the opinion of the Government Engineer be necessary for the accommodation or protection of the lands intersected by the Railway.

3. A certificate signed by the Commissioner or by some other official duly authorised to sign on his behalf shall be conclusive evidence of any order requirement determination or appointment of the Government mentioned in such certificate.

4. All notices to be given to the Company for the purposes of this Contract shall be in writing under the hand of the Commissioner or of some other official duly authorised to sign on his behalf or the Government Engineer or of one of the Crown Agents and shall either be delivered or left for the Company with such person and at such convenient place as the Company shall from time to time appoint in the Protectorate and London respectively (which appointment the Company hereby undertake to make) or failing such appointment at the Registered Office for the time being of the Company or at their principal or last known place of business in the Protectorate.

5. The Government Engineer may from time to time delegate to assistants to be named by him such of the powers rights authorities and discretions vested in him by this Contract as he may think fit and the Company shall recognise such assistants on written notice of their appointment and of the powers rights
authorities and discretions respectively delegated to them as lawfully exercising for the purposes of this Contract the powers and authorities so delegated.

6. Every certificate in writing of the Government Engineer given under his hand shall be binding on the Government and the Company in respect of all matters hereby in effect referred to the decision of such Engineer.

7. The Company shall within the time limited by Clause 14 hereof at their own expense cause a survey of the Railway to be made and prepare and submit to the Government Engineer for his approval proper and sufficient plans and drawings to his satisfaction shewing on a scale not less than two chains to the inch the Railway proposed to be constructed and the route thereof and also plans sections type drawings of works of art and specifications shewing to the like satisfaction the manner in which it is proposed to construct the Railway.

8. The Company shall be entitled free of charge to the use of such plans surveys and reports (if any) of and relating to the Railway as are in the possession of the Government but the Company shall take upon themselves all risks arising from errors in the said plans surveys and reports or any of them or in any local information supplied to them.

9. The Railway shall be considered as divided into sections of twenty miles each which shall be commenced and continued as hereinafter mentioned and the Company may in respect of any such section deviate from the line shown on the said plans to such an extent as may be approved in writing by the Government Engineer.

10. The Company will within 12 months from the date of this Contract deliver to the Government copies of the plans and drawings approved by the Government Engineer showing the lands proposed to be taken for the Railway and the Government will thereafter from time to time put the Engineers or Agents of the Company in quiet possession of the lands shown on such plans or of such other lands equivalent thereto within such limits of deviation as aforesaid as may in the opinion of the Government Engineer be required for the purposes of the Railway but only on payment by the Company of all such compensation as may be payable to any owners tenants or occupiers of such lands and for the purposes aforesaid the Government shall if and so far as may be requisite exercise all such powers of entry and resumption as may have been reserved to the Government by the deeds of grant of such land. No compensation shall be paid in respect of any / lands being the property of the Government except to the person or persons (if any) who shall be tenant or tenants occupier or occupiers thereof. The amount of all compensation payable under this Clause shall be assessed and finally determined by the Government Engineer.

All costs of surveys construction &c. to be borne by the Company

11. The whole of the costs of surveying staking and laying out the Railway and the lands to be taken as aforesaid and of the subsidy lands hereinafter men-
tioned and the costs of the construction and equipment of the Railway and of
the maintenance of the Railway and of all labour and materials for the same shall
be borne and paid by the Company.

12. The whole of the Railway shall be the absolute property of the Company
subject to the rights hereby given to the Government in respect of the same and
subject also as to the accommodation works to the right of user and enjoyment
thereof by the persons for whose benefit the same shall be constructed.

13. The Company will lay out and construct and equip the Railway upon
the 3 ft. 6 in. gauge with a single line. The maximum gradients will be 1 in 50
on straights and 1 in 66 on sharp curves and the sharpest curve allowed will be
of 4 chains radius. Rails to be of steel not less than 41 lbs. per yard run. Sleepers
to be of steel unless the Government Engineer shall require the use of creosoted
timber or hard wood on any part of the line and not less than 2,100 shall be used
to the mile. Formation width in banks to be 10 ft. 6 ins., in cuttings 8 ft. 6 ins.,
exclusive of side drains. Ballast to be 6 ft. 6 ins. wide and not less than 1 cube yard
per yard run. The Company shall equip the Railway with such plant and rolling
stock as shall in the opinion of the Government Engineer be sufficient for the
efficient working of the same and the whole of the permanent way plant and
rolling stock used in the construction equipment maintenance and working of
the Railway shall be such as are in the opinion of the Government Engineer suit-
able to the Protectorate and shall in all other respects be subject to his approval.
All stations, piers, wharves, conveniences and other works which are to be con-
structed under this Contract shall be constructed with such materials and in
such positions and generally in such manner as the Government, may require
Provided that the Company may at any time with the previous consent of the
Government lay down on all or any parts or part of the Railway an additional
line of rails.

14. The survey for laying out the Railway shall be bond fide commenced
within three months from the date of this Contract and shall be carried out by a
sufficient staff of engineers and assistants to the satisfaction of the Government
Engineer and shall be completed to the like satisfaction within nine months from
the same date and the /actual construction of the Railway shall be commenced
within fifteen months from the same date and shall be diligently continued with-
out unreasonable delay or intermission and the whole of the Railway shall be
completed and equipped in all respects in accordance with this Contract and
opened for public traffic on or before the 30th day of June 1902.

15. The Government Engineer may from time to time (if in his discretion
he think fit so to do) on the request in writing of the Company extend the time
for the construction of any of the Works mentioned in Clause 2 hereof for such
period as he may allow.
16. Before commencing the construction of any section the Company shall deposit with the Government Engineer two copies of the plans drawings sections type drawings and specifications mentioned in Clause 7 hereof.

17. On the completion of each section and before opening the same for public traffic the Company shall erect at the termination of such section and thereafter maintain a substantial stone pillar with marks cut thereon designating the number of miles from the starting point at Chiromo and the number of the section ended thereat.

18. The Company shall be entitled to take and get from such places on Crown lands for the time being unoccupied as may have been previously approved in writing by the Commissioner and to use but only for the purpose of the construction of the Railway any suitable timber stone gravel brick earth clay or other like materials which shall for the time being be the property of the Government PROVIDED that the Company shall exercise the powers given to it by this Clause in such manner as shall be approved by the Government Engineer.

19. No import duties or harbour or other dues fees or tolls shall be payable or levied by the Government upon or in respect of (1) any plant materials goods or rolling-stock imported into the Protectorate for the purpose of the construction or equipment of the Railway or (2) any goods or food which in the opinion of the Commissioner shall be imported into the Protectorate for the purpose of and shall be bond fide employed in paying or maintaining any labourers or official employed in or about the construction equipment or maintenance of the Railway. No stamp duty shall be chargeable on or in respect of the engagement of any labourer or other person intended to be employed in or about the construction of the Railway.

20. The Company shall within six months after notice in that behalf from the Government Engineer at their own expense erect fences on such parts of the Railway and in such manner as the Government Engineer shall require and the Company shall thereafter at their own expense maintain such fences in good state.

21. All tolls and rates for the conveyance of passengers animals goods merchandise or other things carried over the Railway or for the use of any pier or wharf connected therewith and bye-laws for the due management thereof shall be subject in all respects to the approval of the Government and such tolls and rates may be demanded and received for all passengers and goods transported and carried upon the Railway or for the use of any pier landing place or wharf constructed under this Contract and shall be paid to such persons and at such places at such rates per mile or fixed charges between stations and otherwise in such manner and under such regulations as the Company may by any bye-law made with such approval as aforesaid direct.
22. The Company shall from time to time print and exhibit or cause to be exhibited in the office and in all and every of the places where the tolls or rates are to be collected in some conspicuous place there a written or printed or partly written and partly printed board or paper exhibiting all the tolls and rates payable and particularizing the price or sum of money chargeable or to be taken for the convenience of any passenger or the carriage of any article or for the use of any pier landing place or wharf.

23. Every bye-law fixing and regulating tolls and rates shall be subject to revision from time to time by the Company with the approval of the Government.

24. Her Majesty’s Naval Military and other forces of every description (whether Imperial or local) and every other person (whether Civil Naval or Military) in the service of Her Majesty when travelling on such service and all prisoners in the custody of any police or other official and all artillery boats sections of vessels machinery horses mules ammunition goods stores and things of every description belonging to Her Majesty and required for any of the purposes of any such forces as aforesaid shall at all times he carried on the Railway at such rates as shall be less by 33\% per cent. than the rates for the time being in force on the Railway and paid to the Company by others for similar fares or freights and so that any Naval Military or Police Forces of Her Majesty and any artillery horses mules ammunition baggage and stores for the use thereof shall if so required by the officer or other person in command of such forces be conveyed with the whole resources of the Company.

25. The Company shall at all times on the requisition of the Government convey on the Railway all mails and all Government provisions and stores (other than those mentioned in the last preceding Clause hereof) at such reduction from the rates for the time being in force on the Railway and under such regulations as the Government and the Company may from time to time agree upon. The expression ‘mails’ in this Clause shall include all letters parcels and other articles for the time being transmissible by post and all bags baskets and other receptacles for the same.

26. The Company shall not without the consent of the Government undertake the transmission by telegraph or telephone of messages for the public nor use or allow to be used their telegraphic or telephonic apparatus for any purpose other than the working and management of the Railway.

27. The Government may at any time cause a line or lines of electric telegraph or telephones to be constructed along the line of the Railway for the use of the Government and for that purpose may from time to time enter upon and occupy so much of the lands of the Company taken under the powers aforesaid as may be necessary for the purpose without making any compensation therefor but making good all damage done and so constructing the said telegraphs and telephones as not to interfere with the efficient working of the Railway by the Company and
such telegraphs and telephones may be used by the Government or its nominees for the purpose of transmitting messages by any system or invention now or at any time hereafter in use. In the event of accident to the telegraphic or telephonic apparatus of the Company the Company shall with the consent of the Government be at liberty to use for the business of the Railway free from charge any telegraphs or telephones constructed under this Clause during such time as the Government shall allow and the Company may at any time or times attach any of their wires to those of the Government with the consent of the Government upon such terms as shall be agreed upon between them and the Company.

28. The Railway shall not nor shall any section thereof be opened for the public conveyance of passengers until one month after notice in writing of the intention to open the same has been given by the Company to the Government Engineer and until 10 days after notice in writing has been given by the Company to the Government Engineer of the time when the Railway or the completed portion thereof will in the opinion of the Company be sufficiently completed for the safe conveyance of passengers and ready for inspection.

29. If the Railway or any section thereof be opened without such notice the Company shall forfeit to the Government the sum of £50 for every day during which the same continues open until such notices as are mentioned in the last preceding Clause hereof (hereinafter called ‘the prescribed notices’) have been duly given and have expired.

30. The Government Engineer upon receiving such notification shall examine and inspect the section of the Railway proposed to be opened and all bridges culverts tunnels road crossings and other works and appliances intended to be used thereon or in connection therewith and if the Government Engineer report in writing to the Government that in his opinion the opening of the said section would be attended with danger to the public using the same by reason of the incompleteness of the works or permanent way or the insufficiency of the establishment for working the Railway together with the grounds of such opinion the Government may from time to time as oft as the Government Engineer after further inspection thereof so report order and direct the Company to postpone such opening for a period not exceeding one month at any one time until it appears to the Government Engineer that such opening may take place without danger to the public. PROVIDED ALWAYS that subject to the exercise of such powers of postponement if the occasion should arise the Government Engineer shall be bound to issue his certificate for the opening of the Railway within fourteen days from the end of the month or ten days mentioned in the last preceding Clause but one hereof whichever of such periods shall last determinate.

31. If the Railway or any section thereof be opened contrary to such order or direction of the Government the Company shall forfeit to the Government
the sum of £50 for every day during which the same continues open contrary to such order or direction.

32. No such order shall be binding on the Company unless therewith is delivered to the Company a copy of the report on which the order is founded.

33. The Company shall at all times after the opening of the Railway and the several sections thereof keep the same and all the bridges level crossings stations permanent way and other works thereon or connected therewith and the rolling stock used thereon in good and proper repair and from time to time renew the same to the satisfaction of the Government Engineer.

34. The Government Engineer whenever he receives information to the effect that any bridge level crossing culvert viaduct or tunnel or any other part of the Railway or any engine car or carriage used or for use on the Railway is dangerous to the public using the same from want of repair insufficient or erroneous construction or from any other cause or whenever circumstances may arise which in his opinion render it expedient may examine and inspect the Railway or any portion thereof or the engines and other rolling-stock in use thereon or any portion thereof and upon such inspection may condemn the Railway or any portion thereof or any of the rolling-stock or other appliances used thereon and with the approval of the Government may require any change or alteration therein or in any part thereof or the substitution of any new bridge culvert viaduct or tunnel or of any material for the Railway and thereupon the Company shall after notice thereof in writing signed by the Government Engineer proceed to make good or remedy the defects in the said portions of the Railway or in the locomotive car or carriage which have been so condemned or shall make such change alteration or substitution as shall have been required in manner aforesaid by the Government Engineer.

35. If in the opinion of the Government Engineer it is dangerous for trains or vehicles to pass over the Railway or any portions thereof until alterations substitutions or repairs have been made thereon or that any particular car carriage or locomotive should be run or used the Government Engineer may forwith forbid the running of any train or vehicle over the Railway or portion of Railway or the running or using of any such car carriage or locomotive by delivering or causing to be delivered to the Company or to any officer having the management or control of the running of trains on the Railway a notice in writing requiring the defects or the nature of the danger to be apprehended.

36. The Government Engineer shall forthwith report all proceedings taken permitted or suffered by him under any of the Clauses 30, 34, and 35 hereof to the Government who shall with all speed either confirm modify or disallow the act or order of the Government Engineer and such confirmation modification or disallowance shall be duly notified to the Company and the Government
Power for the Government Engineer to enter for purpose of inspection

The Company to give information to Government Engineer

Government Engineer to be conveyed with out charge
And have use of telegraphs and telephones

Notice of accidents to be given to Government Engineer

Provisions of this contract not to relieve the Company from liability

Section when certified to be opened and continuously worked Number of trains to be run daily and average speed

No competing line is to be constructed in the Protectorate

Engineer on receipt of such confirmation modification or disallowance shall forthwith duly notify the same to the Company.

37. The Government Engineer may at all reasonable times enter upon and examine the Railway and the stations fences or gates roads crossings cattle guards works and buildings and the engines cars and carriages belonging thereto.

The Company their agents and officers shall afford to the Government Engineer such information as may be within their knowledge and power in all matters inquired into by him and shall submit to the Government Engineer all plans specifications drawings and documents relating to the construction repair or state of repair of the Railway or any portion thereof whether a bridge culvert or other part.

39. The Government Engineer shall have the right whilst engaged in the business of such inspection to travel without charge on any of the trains running on the Railway and to use without charge the telegraph and telephone wires and machinery in the offices of or under the control of the Company.

40. The operators or officers employed in the telegraph or telephone office of or under the control of the Company shall without unnecessary delay obey all reasonable orders of the Government Engineer for transmitting messages.

The Company shall as soon as possible after the occurrence upon the Railway of any accident attended with serious personal injury to any person using the same or whereby any bridge culvert viaduct or tunnel on or of the Railway has been broken or so damaged as to be impassable or unfit for immediate use give notice thereof to the Government Engineer and if the Company willfully omit to give such notice the Company shall forfeit to the Government the sum of £20 for every day during which such willful omission to give the same continues.

42. No inspection under this Contract nor anything in this Contract contained or done or ordered or omitted to be done or ordered under or by virtue of the provisions of this Contract shall relieve or be construed to relieve the Company of or from any liability or responsibility resting on them by law either towards the Government or towards any person.

43. On the expiration of the prescribed notices and as soon as any section of the Railway shall be completed and certified to be fit for traffic as aforesaid the Company shall forthwith proceed to open and shall continuously thereafter except when prevented by causes which shall be certified by the Government Engineer to be beyond the control of the Company keep open and work the same for public and general traffic and shall run thereon in each direction at least one as train on every day at an average speed of not less than 20 miles per hour.

44. So long as the Company shall keep open and work the Railway in accordance with the provisions of this Contract to the reasonable satisfaction of the Government no line of railway directly competing with the Railway shall be constructed in the Protectorate and (subject to the next succeeding Clause hereof)
the Company shall have the first offer of constructing and working in the Protectorate extensions of the Railway and branch lines connected therewith upon such terms as may be agreed upon between the Company and the Government.

45. If the Government shall accept the offer of the Company to construct and work in the Protectorate any extension or branch of the Railway under the last preceding Clause hereof and if the Company shall refuse or neglect to construct such line or lines within such time and upon such terms as shall have been agreed as aforesaid then the Government may at its option either itself construct and work such line or lines or may grant a concession for the construction and working thereof to any other company or to any persons upon such terms as the Government may think fit.

46. The Government will (if and so far as it lawfully can) grant or procure to be granted to the Company running powers over and facilities for interchange of through traffic with any Railway directly or indirectly connected with the Railway which may consistently with the stipulations of this Contract be constructed in the Protectorate such powers and facilities to be exercised and enjoyed upon such terms as may be agreed upon between the parties or in case of difference as may be determined by arbitration under the provisions hereinafter contained. /

47. Subject to the provisions, hereinbefore contained the Government or any Authority Company or other person constructing or working any Railway within the Protectorate or any adjoining territory or country may at any time hereafter construct any branch or main lines to join the Railway and the Company shall permit all such junctions and works to be made and executed on their Railway as may in the opinion of the Government Engineer be necessary for forming such connections.

48. The Government and any Authority Company or persons lawfully using any Railway either in the Protectorate or in any adjoining Territory or Country or any such branch or main line as aforesaid may upon terms and conditions to be agreed upon between the Government and the Company or in case of difference upon such terms and conditions as may be settled by arbitration in manner hereinafter provided run over and use with their engines and carriages of every description and with their clerks officers and servants the Railway together with the stations booking offices warehouses sidings passing places and other works and conveniences connected therewith respectively.

49. The Company will subject to the due payment to them of the proper tolls and rates forthwith and without unreasonable delay forward over the Railway all passengers goods or merchandise which shall have been carried or be intended to be carried over such branch or main line as aforesaid or any parts thereof or any other line for the time being in connection with the Railway.

50. The Company shall on the requisition of the Government or of any other authority company or person for the time being owning or working any
Railway in the Protectorate or elsewhere in connection with the Railway make such arrangements for the regulation and interchange of traffic passing to and from the said respective Railways and for the working of the traffic over the said Railways respectively and for the division and apportionment of tolls rates and charges in respect of such traffic and generally in relation to the management and working of the said Railways or any of them or any part thereof so that the Railway may be worked for the greatest convenience of the public. And in case the Government and / the Company shall be unable to agree as to the terms of such arrangement such terms shall be settled by arbitration in the manner hereinafter mentioned.

51. The Company shall according to their powers afford all reasonable facilities to the Government and to any other Authority Company or persons lawfully using any other Railway for the receiving and forwarding and delivering of traffic upon and from the several Railways belonging to or worked by the Government or by such other authority company or persons and for the return of carriages, trucks and other vehicles and the Company shall not give or continue any preference or advantage to or in favour of any particular company or person or any particular description of traffic in any respect whatsoever nor shall the Company subject any particular authority company or person or any particular description of land-born or water-born traffic to any prejudice or disadvantage in any respect whatsoever and the Company shall afford all reasonable facilities for the receiving and forwarding by their Railway all the traffic arising from any other Railway in connection therewith and all water-born without any unreasonable delay and without any preference or advantage or prejudice or disadvantage and so that no obstruction may be offered in the using of the Railway as a continuous line of communication and (in the case of any water-born traffic) in connection with the vessels or boats conveying such traffic and so that all reasonable accommodation may at all times by the means aforesaid be mutually afforded by and to the authorities companies or persons working railways adjoining to or connected with each other and any agreement made by the Company contrary to the foregoing provisions shall be unlawful null and void.

52. The Company may from time to time and at any time after the Railway has been constructed equipped and opened for traffic in accordance in all respects with this Contract borrow or raise upon the security of the Railway monies to such an amount as shall have been previously approved in writing by the Government (which monies are hereinafter referred to as ‘the Debenture Capital’) subject to the following conditions:–

(a) All Debenture Capital shall as and when received be paid to the Bankers of the Company to the credit of such Trustees or Trustee as shall have been previously approved by the Government and shall be held by such Trustees or Trustee upon trust to apply the same in such expenditure as in the opinion of the
Government shall be calculated to improve or develop the Railway and as shall in the like opinion be properly chargeable to capital. PROVIDED that no part of the Debenture Capital shall be so applied except / on the production of proper certificates signed by the Government Engineer.

(b) In the event of the Government purchasing the Railway under the powers hereinafter contained the Debenture Capital for the time being outstanding and the interest thereon shall as from the date of such purchase cease to be a charge upon the Railway or upon any rolling stock or other assets included in such purchase and shall thenceforth be a charge upon so much of the purchase monies of the Railway as shall be payable to the Company.

(c) Every instrument issued by the Company to any holder of any part of the Debenture Capital shall contain or be endorsed with a statement to the effect of the last preceding sub-section.

(d) Except as aforesaid the Company shall not at any time borrow or raise any money upon the security of the Railway or of any rolling stock or other chattels used in connection therewith.

53. The Government may upon giving to the Company twelve months’ previous notice in writing expiring at any time after the expiration of twenty-five years from the date when the whole of the Railway shall have been opened for public use of their intention in that behalf purchase the Railway together with all telegraphs telephones and other works and conveniences connected therewith and the engines carriages stock plant and machinery belonging to the Railway and on the expiration of 12 months from the date of such notice all land provided by the Government or otherwise acquired by the Company for the purposes of the Railway or any works and conveniences connected therewith (but not including any of the subsidy lands hereinafter mentioned) and the Railway and all buildings works piers landing places wharves fixed machinery rolling stocks telegraphs and conveniences whatsoever connected with or used for or in respect of the Railway shall become the absolute property of the Government as the owners thereof by purchase free from all incumbrances and they shall thereupon be entitled to and shall take possession thereof and the Company shall at the same time deliver to the Government the engines carriages stock plant and machinery belonging to the Railway and all plans surveys sections books printed matter writings and documents whatsoever in anywise connected with the undertaking and affairs of the Railway and the Government shall on its taking such possession pay to the Company or their assigns in London

(a) A sum equal to the aggregate amount of so much of the / prescribed sum as shall in accordance with, the provisions hereinafter contained have been from time to time paid to the Company or certified to be due to them.

(b) Such further or additional sums as shall from time to time have been certified in writing by the Government Engineer to have been expended by the
Company in the improvement or development of the Railway and to have been properly charged against capital and

(c) A sum equal to five years’ purchase of the average net receipts of the Company for the five years ending on the 31st day of December last preceding the date of the notice to purchase after deducting therefrom such a sum if any as ought in the opinion of the Government Engineer to be deducted for depreciation and also such further sum as ought in the like opinion to be deducted in respect of the cost of any rolling-stock or plant which shall then in the opinion of the Government Engineer be unfit for use.

It shall be lawful for but not obligatory upon the Government to retain and satisfy out of any moneys payable to the Company hereunder the amount of all or any of the wages and other claims and demands of any kind then existing against the Company and for which they may then be legally liable and which would in the opinion of the Government be properly chargeable against the revenue account of the Company in respect of the Railway and which shall not be shown to have been fully satisfied and discharged or otherwise provided for to the reasonable satisfaction of the Government. The purchase by the Government of the Railway in manner aforesaid shall effectually release and discharge the Company from all liability in respect of the then future working and maintenance of the Railway.

54. The Company shall keep proper books of account showing all the particulars of their receipts and expenditure and all other matters usually entered in the books of concerns of the like nature in such form and manner as the Government may from time to time reasonably require and the same together with all vouchers and other books and papers in anywise necessary or useful for the verification of such accounts shall at all times be open to the inspection of any officer or accountant appointed by the Government for the purpose who shall be at liberty to take copies thereof and extracts therefrom and the Company will supply all such evidence and information as the Government shall reasonably require for verifying the accounts aforesaid and enabling the Government to ascertain the amount of the receipts and of the cost of working the Railway.

55. After the expiration of 20 years from the date when the whole of the Railway shall have been opened for public use the Company shall within 30 days after the expiration of every subsequent year ending on a 31st day of December furnish to the Government accounts shewing the gross receipts the working expenses and the net receipts of the Railway during such year and every account so furnished shall from time to time and at such time as the Government may require be audited by some person or persons to be from time to time appointed and employed by the Government and such person or persons is and are hereinafter included in the expression ‘the Government’ Auditors.’ The Company shall produce to the Government Auditors all vouchers books accounts papers and
documents of the Company which such Auditors may require for the purpose of their audit and shall afford them all possible facilities for the performance of their duties. Among the functions of the Government Auditors shall be included the duty of seeing that the gross receipts, the working expenses, and the net receipts of the Railway are correctly stated in the accounts furnished by the Company under this Contract. Any correction made in such accounts by the Government Auditors and assented to by the Company shall be conclusive. If in consequence of the audit of the Government Auditors the Government shall require any alteration to be made in the accounts furnished by the Company and the Company shall object to such alteration the matter in difference shall be referred to and settled by the Government Engineer.

56. For the purposes of all such accounts the net receipts of the Railway shall be ascertained by deducting the working expenses of such Railway from the gross receipts thereof and working expenses shall mean and include only such payments as in like concerns are usual and properly chargeable to revenue and so that if any question shall arise as to what constitutes working expenses such question shall be determined on the general principle that capital is to bear the cost of new works of additional rolling-stock plant and machinery and of substantial improvements of and additions to old works rolling-stock and machinery including the cost of temporary new work the construction of which is requisite for the construction of a work properly chargeable to capital and that the cost of repairs, restorations, renewals, replacements and substitutions other than such as may be due to defective construction is to be borne by revenue.

57. In consideration of the obligations imposed on the Company by this Contract the Government shall subject to the provisions hereinafter contained grant in fee simple to the Company by grants in the form prescribed by the laws or regulations for the time being in force in the Protectorate a subsidy of 1,000 acres of land for each mile of the Railway and so that such lands (called in this Contract ‘the subsidy lands’) shall be Crown lands and shall be selected and allotted in manner hereinafter provided. Provided that such grants shall contain provisions in such form as the Government may think fit entitling the Company to win get and take away all minerals and other like substances usually reserved to the Government in grants of Crown lands subject to the payment to the Government of a royalty of 5 per cent, upon the gross value of all minerals and substances so gotten.

58. The subsidy lands shall be selected and allotted by agreement between the Government Engineer and the Company subject to the following provisions and conditions:

(a) Subject to the provisions hereinafter contained the subsidy lands to be granted in respect of each section of the Railway shall (when such section shall have been duly completed and opened for traffic) be selected within an area
bounded on two sides by lines drawn on each side of and parallel to the Railway at a distance not exceeding two miles therefrom and on the other two sides by lines drawn at right angles to the Railway through the termini of such section. Each such quantity shall be selected in one block or in blocks of not less than 500 acres each in extent.

(b) The boundaries of such block or blocks (except so far if at all as they shall be bounded by the lands taken for the Railway) shall (unless the Government Engineer shall otherwise think fit) be in the direction of and at right angles to the meridian.

(c) Half the Crown lands fronting on the Railway along each section either wholly on one side or partly on one side and partly on the other side of the Railway shall be reserved to the Government. Provided that if in respect of any mile of the Railway (computed from the commencement of any section) there shall be no Crown lands fronting on the Railway the subsidy lands in respect of such mile may be selected from such other Crown lands in the Shire District of the Protectorate as may be approved by the Government Engineer.

(d) Nothing herein contained shall entitle the Company to a grant of any subsidy lands in Chiromo or Blantyre or within three miles of either of such places.

(e) The decision of the Government Engineer as to all questions arising under this Clause shall be final.

59. On the completion and opening of each section of the Railway the Government will issue to the Company Deeds of Grant of one moiety of such of the subsidy lands as front on or are adjacent to such section such moiety to be selected by the Government Engineer but it shall if required include a reasonably fair proportion of the frontage of such subsidy lands upon the Railway.

60. On the completion and opening of the whole of the Railway within the time limited for that purpose by this Contract the Government will issue to the Company like Deeds of Grant for the remaining moiety of the last-mentioned subsidy lands.

61. On the Company becoming entitled to the Deeds of Grant mentioned in the last preceding Clause hereof the Government will grant to the Company in fee simple such of the lands belonging to the Government as shall have been taken under the provisions of this Contract for the purposes of the construction of the Railway.

62. If the Railway shall not be completed and opened within the time limited in that behalf the said remaining moiety of the subsidy lands to which the Company would otherwise have become entitled as aforesaid shall be absolutely forfeited to the Government unless such non-completion shall in the opinion of the Government Engineer have arisen from some inevitable cause or from some act of the Government.
63. In case any part of the subsidy lands shall be in the occupation of any
lessees or licensees from the Government the Company shall pay them fair com-
ensation for all improvements made by them or their predecessors upon their
holdings such compensation to be assessed by arbitration in case of difference.

64. The sum of £ (in this Contract called ‘the prescribed sum’) which has
been placed by the Company to the credit of and at the Bank shall be held by
the said and or other the trustees or trustee for the time being thereof upon
trust to apply the same in or for the purpose of the construction or equipment
of the Railway or for the acquisition of any land required for the Railway or for
any other purpose which the Government may deem incidental to any of such
purposes and such application shall be made in accordance with proper certifi-
cates of the Government Engineer of the value of the work for the time being
executed or equipment or land (other than lands given by the Government) or
materials provided by the Company for the purposes of the Railway based on a
Schedule of Prices agreed upon between the / Government Engineer and the
Contractors at the time of fixing the prescribed sum and the residue (if any) of
the prescribed sum shall so soon as the Government Engineer shall have certified
that the Railway has been constructed completed and equipped in accordance
with this Contract be paid or transferred to the Company or otherwise dealt
with as the Company shall direct.

65. If the Company from any cause whatever fail to construct complete and
equip the Railway in accordance in all respects with this Contract and within
the time thereby prescribed or if in the opinion of the Government Engineer
the Company shall fail to proceed with due despatch in the construction of the
Railway having regard to the time within which the same are to be completed or
in any other respect fail in the due performance or observance of this Contract
then and in every or any such case if the Government Engineer certifies that it is
in his judgment proper for the Government so to do the Government may take
possession of the Railway and of all plant materials and appliances provided for
the same and may employ such persons or corporations as the Government may
think fit either by contract or otherwise as the Government Engineer certifies

Company to compensate lessees for improvements
Application of the prescribed sum

Rights of Government on default by Company

As to completion of Railway and Works by the Government

66. If the Government under the last preceding Clause elect to proceed with
the Railway all monies which shall in the opinion of the Government Engineer
be required for the purpose of constructing completing and equipping the Railway in accordance with this Contract and for otherwise fulfilling the obligations of the Company under this Contract shall be paid out of the prescribed sum if and so far as the same shall suffice and if and so far as the same shall not suffice shall be paid by the Company to the Government on demand and until such payment shall together with interest thereon at the rate of 5 per cent. per annum from the date of such demand be charged upon the Railway and undertaking of the Company in priority to all other claims thereon.

67. If the Company shall fail to comply with any of the provisions of Clause 43 hereof the Government may enter upon and take possession of and use the Railway and all the rolling stock machinery engines and plant of the Company and use and work the same and appropriate the receipts and profits arising therefrom without being liable for any loss or damage incurred thereby and the Company shall pay to the Government all expenses incurred for the user working maintenance and repair of the Railway rolling stock machinery engines and plant during such time as the Government shall be in possession as aforesaid. The Company shall also be subject to and shall pay to the Government a daily fine of £100 so long as they shall continue in possession as aforesaid.

68. As a security for the due performance of the covenants and conditions contained herein the Company shall on the execution of this Contract pay to the Government the sum of £10,000 which sum together with the yearly interest or income thereof shall be invested at the risk of the Company by the Government in the names of nominees of the Government and upon such securities or investments as the Company may select and the Government approve. This sum and all accumulations thereof or the investments representing the same together with all interest and dividends thereon shall (subject as hereinafter mentioned) remain in the hands of the Government as a guarantee fund and are hereinafter collectively referred to as 'the Guarantee Fund.'

69. If the survey for laying out the Railway shall not be bona fide commenced within three months from the date hereof or if the actual construction of the Railway shall not be bona fide commenced within 15 months from the same date or if the Railway shall not be completed equipped and fit for public traffic and opened on or before the 30th day of June 1902 or if the Company shall fail to comply with any other of the conditions or stipulations herein contained then without prejudice and in addition to any other rights given to the Government by this Contract the Government may if they shall think fit rescind or annul this Contract and thereupon the guarantee fund shall be transferred to and become the absolute property of the Government provided always that the rescission or amendment of this Contract shall not take away or affect any right claim or demand which the Government may have against the Company under this Contract or on account of any breach thereof by the Company.
70 If the Company shall duly carry out the provisions of this Contract then upon the expiration of three months from the opening of the whole of the Railway the guarantee fund shall be transferred to the Company or as they shall direct. Provided always that the Government may from time to time pay and deduct out of the guarantee fund any monies which the Company may have become liable to pay by way of fine penalty or otherwise under the provisions of this Contract.

71. The Company shall not assign lease or otherwise dispose of the benefit of this Contract or the Railway or the undertaking of the Company without the previous consent in writing of the Government and such consent may in the case of an assignee or lessee not approved by the Government be refused without their being bound to give any reason for such refusal.

72. The Government shall have the same rights and remedies against any such assignee and such assignee shall have the same rights and remedies against the Government as would have been the case if such assignee had been a party hereto instead of the Company.

73. The Company shall always be and remain British in character and shall have its principal office in Great Britain or in some town in the Protectorate and the Company’s principal representative in the Protectorate and all its Directors shall always be natural born British subjects or persons who have been naturalized as British subjects by or under an Act of Parliament of the United Kingdom or by or under some Statute or Ordinance of some British African Colony or territory.

74. Nothing contained in this Contract shall exempt the Railway or the Company from the provisions of any General Ordinance Law or Regulation now in force or hereafter to be passed relating to Railways in the Protectorate.

75. Except in so far as is by this Contract otherwise expressly provided nothing herein contained shall in any manner affect the rights of Her Majesty or any person or corporation.

76. No member or officer of the Government and none of the Crown Agents shall be in anywise bound personally for the acts and obligations of the Government under this Contract or answerable for any default or omission in the observance performance or fulfilment of the acts matters or things which are hereby made obligatory on the Government.

77. In case and so often as any dispute difference or question shall arise between the said parties hereto or any Government person or corporation claiming through or under them respectively or between any of such Governments persons or corporations or between the Government Engineer and the Company concerning or relating to the Railway or any part thereof respectively or the construction meaning or effect of this Contract or any Clause or thing herein contained or the rights or liabilities of any party hereto or of any...
such Government person or corporation as aforesaid under this Contract then (except in any case and as to any matter for which other provision is hereinbefore made) the subject of every such dispute difference or question shall in every case on the demand in writing of either party be referred to the arbitration and award of an umpire if the parties can agree to an umpire and in case they cannot so agree then of three arbitrators one to be appointed by each party to the reference and the third by the two arbitrators so appointed. The decision of such umpire or arbitrators or of any two of such arbitrators as the case may be shall be final and without appeal and binding upon all parties. If either party to any such dispute difference or question make default in appointing an arbitrator within 14 days after the other party has given him or them notice to appoint the same the party who has appointed an arbitrator may appoint that arbitrator to act as sole arbitrator in the reference and his award shall be final and binding on all parties and all the provisions herein contained with reference to the proceedings of two arbitrators and an umpire shall mutatis mutandis be applicable to such sole arbitrator.

78. The arbitrators and umpire shall have full power to make if they or he think fit several awards instead of one award and every such award though not on the whole matter shall be final so far as it extends and as if the matter awarded on were the whole matter referred.

79. The Arbitrators and Umpire shall have full power to proceed in the absence of both or either of the parties after giving to both parties such notice as the Arbitrators or Umpire may think sufficient of their or his intention to proceed.

80. The Arbitrators and Umpire shall have full power to inspect the books documents and accounts of both parties and examine on oath or affirmation or on Statutory declaration in lieu of oath the officers agents servants and witnesses of the parties respectively. / 

81. The costs of the Reference and the Awards shall be in the discretion of the Arbitrators and Umpire and such costs may be awarded as between Solicitor and client.

 [...]
Central Africa Railway Company Limited and Shire Highlands Railway Nyasaland Limited and the Crown Agents for the Colonies on behalf of the Nyasaland Government: Conditional Agreement (1930); held at the National Archives, CO 525/139/2.

NOTE ON THE REQUEST OF THE NYASALAND RAILWAY COMPANIES FOR CONFIRMATION OF THE CONDITIONAL AGREEMENTS OF 15TH MAY, 1930.

The two Agreements dated 15th May, 1930

(1) with the Central Africa and Shire Highlands Railway Companies, and

(2) with the Trans-Zambesia Railway Company, are, as, regards certain important clauses, conditional, *‘inter alia,’ on ‘All necessary consents from the Portuguese Government and the Mozambique Company to the carrying out of the operations contemplated by the Agreement being obtained within six months from the date† hereof, or such extended period to which the Government may agree.’

The CAR/SHR Agreement is also dependent upon the T.Z.R. Agreement becoming unconditional.

On the 8th December, Sir Ernest Roney, the Companies’ Solicitor, appeared before the Zambesi Bridge Committee with the request that the Conditional Agreements should be made unconditional without waiting for the stipulated Portuguese consents. He said that the following documents required the approval of the Portuguese authorities:—

(i) The Articles of Association of Nyasaland Railways Limited

* See Clause 29 of CAR/SHR Agreement, and Clause 20 of T.Z.R. Agreement.

† i.e., 15th May 1930. The period has been extended until 15th Feb. 1931, and a further short extension will be necessary.
(ii) The form of the Bridge Debenture
(iii) The form of the additional Debenture of the Trans-Zambesia Railway
(iv) The form of the Southern Approach Income Bonds of the Trans-Zambesia Railway.

He said that (iii) and (iv) were ready for to the Portuguese Government submission/but that it was not possible to submit (i) and (ii) until the constitution of the new Company (Nyasaland Railways) had been completed, i.e., / until the purchase of the Shire Highlands Railway and of 90% of the share capital of the Central Africa Railway by the new Company had been effected. Sir Ernest said that he was not in a position to complete this transaction until he was able to inform the shareholders of S.H.R. and C.A.R. that the Agreement was no longer conditional.

The Zambesi Bridge Committee saw considerable objection to varying the terms of the Conditional Agreement in the manner suggested, and they did not see why the completion of the purchase of the S.H.R. and C.A.R. shares should not be carried through forthwith. The Committee suggested to Sir E. Roney that his difficulty might be met by the Government agreeing to make provisional advances, under Clause 26 of the SHR/CAR Agreement, to the new Company, pending the Portuguese Government’s approval of the scheme.

The following day General Hammond received a letter from Mr. Codrington, the new Chairman of S.H.R., renewing the suggestion that the condition as to Portuguese consent should be waived. In this letter it was for the first time pointed out that the Resolutions in favour of the whole Scheme which had recently been passed at Meetings of the S.H.R. and T.Z.R. debenture holders and shareholders, were conditional on the Agreements of 15th May becoming unconditional, and that unless the Companies’ suggestion could be adopted, it would be necessary / to call further Meetings of the debenture and shareholders in order to pass revised Resolutions. This would have a deplorable effect both in London and in Portugal.

This letter was discussed on the 10th December at a Meeting at which Sir John Campbell, General Hammond, Mr. Skevington and I were present. It was generally agreed that it would be most undesirable that further Meetings of the S.H.R. and T.Z.R. debenture holders should be called, but it was felt strongly that in omitting to mention the point raised in Mr. Codrington’s letter with regard to the form of the Resolutions passed by the Companies, Sir E. Roney had not dealt frankly with the Zambesi Bridge Committee and that it was in any case difficult to understand how the Resolutions came to be passed in such an inconvenient form. It was decided to ask Mr. Baird, the Solicitor employed by the Government, for his observations in the first place, and then to refer the whole question again to the Zambesi Bridge Committee.
Mr. Baird was at first disposed to accept the Companies’ proposal. He hoped that any dangers which we might run by so doing would be rather theoretical than practical, and he had no doubt that whatever they might be, we should succeed in surmounting them. He agreed that there had been a want of frankness in the matter, and was not surprised that we suspected ulterior motives on the part of the Companies. Later, however, Mr. Baird changed his view, and definitely advised that the Companies proposals should not be accepted. He argued as follows:—

The Resolutions of the shareholders in favour of the scheme were passed subject to the Conditional Agreement becoming Unconditional.

In the circulars sent out to the shareholders and debenture holders of C.A.R. and S.H.R. it was made clear that the Conditional Agreement would not become unconditional until any necessary consents were obtained from the Portuguese Government.

The Conditional Agreement was offered for inspection and the shareholders and debenture holders concerned must be taken to have full notice of its contents.

When the Resolutions in favour of the Scheme say that they were passed ‘Subject to such Agreement becoming unconditional’ that must mean unconditional owing to the fulfilment of all the terms laid down in Clause 29 of the Agreement including the consents of the Portuguese Government.*

If that were not so there would be nothing to prevent the Government from agreeing with S.H.R. and C.A.R. that the Agreement shall become unconditional on the fulfilment of a set of terms differing from those set out in Clause 29. It was not now possible by means of a new arrangement made between the Government and the Companies, without the knowledge and sanction of the shareholders and debenture holders, to vary as against them, the terms upon which the Conditional Agreement was to become unconditional. / If that were done, the shareholders would, in Mr. Baird’s opinion be able to upset the Scheme on the ground that the terms of the Government Agreement had been varied without their consent.

In the circumstances, Mr. Baird advised that the only thing to do was to continue to make temporary advances for the present and to defer the taking over of the assets of the S.H.R. and the shares of C.A.R. until any necessary consents from the Portuguese Government had been obtained.

On the 16th December, Mr. Baird’s letter was considered by the Zambesi Bridge Committee and it was agreed that a letter should be sent to the Railway Companies refusing their request for the reasons advanced by Mr. Baird, but informing them that the Committee would be prepared to recommend, as a satisfactory fulfilment of the condition as to Portuguese consents, the production of a letter from a responsible Portuguese official signifying approval of the
documents which required to be presented to the Portuguese Government and stating that the necessary decree would be issued in due course.

The Foreign Office representative on the Committee pointed out that the political situation in Portugal was at the moment unusually favourable as that country was evincing its desire in more than one direction to prove its goodwill towards Great Britain; furthermore, the present Ambassador (Sir F. Lindley) had acquired considerable personal prestige with the Portuguese Government. This information was communicated privately to the Chairman of the Nyasaland Railways Limited.

On the 5th January, I had a letter from the Foreign Office representative on the Committee (Mr. Wiggin), saying that Mr. Oury had discussed the matter at the Foreign Office. Mr. Oury had explained that the question was one falling within the competence of the Portuguese Colonial Council at Lisbon, a body over which the present Government exercised comparatively little control. He said that the Colonial Council in their turn was effectively guided in matters of this kind by a M. Lisboa de Lima. He was due in London in a week’s time and could be invited to state in writing that the documents were in order. As a prior step, Mr. Oury recommended that the Companies should enlist the aid of M.R. Lopes, who was due in London immediately and who is the lawyer in Lisbon both of the Nyasaland Railways and of the Port of Beira. Mr. Oury said that M. Lopes was highly regarded by H.M.’s Embassy at Lisbon and that the Portuguese Government had given repeated proof of the weight which they attached to his opinions on African Colonial problems. He suggested that we should be satisfied with a statement in writing to the Companies’ Lawyers from M. Lisboa de Lima agreeing with an opinion by M. Lopes that the documents were open to no objection.

The Foreign Office telegraphed the substance of this interview to the Ambassador at Lisbon and asked for his opinion on Mr. Oury’s suggestion. In the meantime a Meeting of the Zambesi Bridge Committee was called to consider the question further. At this Meeting Mr. Oury and Mr. Codrington attended and produced a letter from their Portuguese local adviser, M. Lopes, in which the opinion was expressed that everything done by the Companies so far was strictly in order from the point of view of Portuguese law, and that the further steps required were of a purely formal nature, amounting to a little more than registration.

Mr. Wiggin informed the Committee that Sir F. Lindley had telegraphed that he had no personal knowledge of M. Lopes. The late Charge d’Affaires at Lisbon however knew M. Lopes personally and had a high regard for his character and ability.

Mr. Oury then informed the Committee that M. Lisboa de Lima had been prevented from going to London, but that he now saw no advantage in getting
M. de Lima’s opinion since it had been ascertained that the necessary documents would not have to go before the Colonial Council at Lisbon. Both he and Mr. Codrington urged that the procedure now required in Portugal was merely equivalent to registration of documents in Somerset House in this country.

The Committee felt that, however high the reputation of M. Lopes, it would be desirable to obtain some official confirmation of his opinion through the Diplomatic channel.

The Companies’ representatives were inclined to demur to this step as investing a purely commercial matter with a false importance, and involving the risk of raising unnecessary and inconvenient queries / in Portugal. It was, however, explained that it was not proposed that an official note should be addressed to the Portuguese Government, but that Sir F. Lindley should be asked to satisfy himself by informal enquiries in Portuguese official circles that no difficulty would be experienced when the documents were presented for the necessary consents.

It was accordingly agreed that Mr. Codrington should send to the Foreign Office a full memorandum explaining the situation, and that the Foreign Office should send this memorandum with copies of all the relevant documents by despatch to Sir F. Lindley asking for a telegraphic reply. It was also agreed that M. Lopes should get into touch with Sir F. Lindley at an early date. A copy of the telegram received from Sir F. Lindley has now been sent to us by the Secretary of the Zambesi Bridge Committee.

There has been no further Meeting of the Committee but the members have been consulted separately and, as will be seen from Mr. Bradstreet’s letter, they agree in recommending that the result of Sir F. Lindley’s enquiries should be regarded as satisfactory. The gist of the information which Sir F. Lindley has obtained from the Portuguese Foreign Office is that as soon as the Companies ask for approval of the Articles of Association of the new Company, and of the form of the various debentures, &c., such approval will be quickly granted provided that the documents satisfy all local conditions and are in harmony with the interests of the Portuguese Republic. Sir F. Lindley would have preferred the omission of the last ten words, but he is satisfied that these have only been added as a matter of formality.

M. Downie 13.2.31/

An Agreement made the —day of February 1931 BETWEEN THE CENTRAL AFRICA RAILWAY COMPANY LIMITED whose registered office is at 3 Thames House Queen Street Place in the City of London (hereinafter called’ C.A.R.’) of the first part SHIRE HIGHLANDS RAILWAY NYASALAND LIMITED whose registered office is at 3 Thames House aforesaid (hereinafter called ‘S.H.R.’) of the second part and THE CROWN AGENTS FOR THE COLONIES of 4 Millbank in the City of Westminster (who and
the Crown Agents for the Colonies for the time being are hereinafter referred to as ‘the Crown Agents’) acting for and on behalf of the Government of Nyasaland Protectorate (hereinafter called ‘the Government’) of the third part and NYASALAND RAILWAYS LIMITED whose registered office is at 3 Thames House aforesaid (hereinafter called ‘the New Company’) of the fourth part.

Whereas:–

(1) This Agreement is supplemental to a Conditional Agreement dated 15th May 1930 and made between C.A.R. of the first part S.H.R. of the second part and the Crown Agents acting for and on behalf of the Government of the third part (hereinafter called ‘the Conditional Agreement’) whereby it was agreed (inter alia) that C.A.R. and S.H.R. should forthwith take steps with a view to the incorporation of the New Company therein mentioned under the Companies Act 1929 having for its primary objects:–

(a) the acquisition of not less than 90 per cent. of the issued share capital of C.A.R., and

(b) the acquisition of the undertaking and assets subject to certain of the debts and liabilities of S.H.R. in accordance with the provisions of the Conditional Agreement.

(2) In pursuance of the Conditional Agreement the New Company has been incorporated with a Share Capital of £475,000 divided into 420,000 Ordinary Shares of £1 each and 1,100,000 ‘A’ Ordinary Shares of 1s. each with the rights and privileges set out in its Memorandum and Articles of Association and having for its objects (inter alia) the acquisition of the said shares of C.A.R. and the undertaking and assets subject to the debts and liabilities of S.H.R. before mentioned and otherwise to give effect to the terms and conditions of the Conditional Agreement.

(3) The Portuguese Government and the Mozambique Company have approved the plans for the Bridge over the Zambesi River and the Northern and Southern Approach lines thereto and have given such consents to the Scheme for the Zambesi Bridge and Connecting Railways as are required of them up to the date hereof.

(4) Contracts for the construction of the said Bridge and the Southern Approach line have been entered into by C.A.R. and the Trans-Zambesia Railway Company Limited (hereinafter called ‘T.Z.R.’) respectively with The Cleveland Bridge and Engineering Company Limited and the construction of the Northern Approach line to the Bridge is being carried out by C.A.R.


(6) The New Company has agreed with C.A.R. and S.H.R. to take over adopt and carry into effect the Conditional Agreement and the terms condi-
tions and obligations thereby provided to be undertaken and carried out by the New Company as if it had been a party to the Conditional Agreement.

Now these Presents Witness and Declare as follows:–

1. The Conditional Agreement is hereby adopted by the New Company and shall subject as hereinafter provided be binding on C.A.R., S.H.R., the Crown Agents acting for and on behalf of the Government and the New Company in the same manner and take effect as if the New Company had been in existence at the date thereof and had been a party thereto.

2. S.H.R. will sell and transfer and the New Company will acquire and take over the undertaking and assets of S.H.R. and the New Company will satisfy the purchase consideration as stated in the Conditional Agreement and undertake the debts and liabilities of S.H.R. (other than the Debenture Stock and Second Debentures of S.H.R.) and the payment of the costs of winding up and dissolving S.H.R. and otherwise upon the terms and conditions mentioned in the Conditional Agreement.

3. For the purpose of carrying into effect the said sale and the distribution of the purchase consideration in accordance with the provisions of the Conditional Agreement and these presents S.H.R. shall forthwith procure the passing of the necessary Resolutions for placing S.H.R. in liquidation and authorising the Liquidator to execute and do all instruments acts and things required to carry out the said sale and distribution as aforesaid.

4. If any holders of Debenture Stock Debentures or Shares in S.H.R. shall become entitled to fractional parts of a share in the New Company the New Company shall issue fractional certificates therefor in such form as S.H.R. or its liquidator may reasonably require. /

5. The New Company shall accept the title of S.H.R. to the undertaking and assets hereby agreed to be sold and transferred.

6. The New Company shall until the dissolution of S.H.R. at its own expense produce and show at such times and to such persons and in such places as the said Liquidator shall require all the books documents and papers of S.H.R. hereby agreed to be sold.

7. The New Company will purchase the whole or at least 90 per cent. of the fully paid Preference Shares and Ordinary Shares respectively of C.A.R. and for that purpose will forthwith make a formal offer to all the holders of shares in C.A.R. to purchase their shares upon the terms and conditions of the Provisional Agreements already made by C.A.R. with some of the holders of such shares. A specimen of the said Provisional Agreements and a list of such holders and the shares held by them respectively are annexed hereto.

8. The New Company will also repay to C.A.R. all expenses incurred by C.A.R. in the investigation of the Zambesi Bridge Site Southern Approach and Northern Approach in the Conditional Agreement referred to and of and
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incidental to the negotiation and completion of all arrangements in connection with the scheme for the construction of the Zambesi Bridge Southern Approach and Northern Extension and the purchase of the shares of C.A.R. as mentioned in the Conditional Agreement.

9. The purchases of the undertaking and assets of S.H.R. subject as aforesaid and of the said shares of C.A.R. respectively shall be completed on or before the 31st day of March 1931 or at such later date as may be agreed at the office of the New Company aforesaid and/or in Nyasaland when S.H.R. and its Liquidator shall execute and do such documents acts and things as the New Company may require for the completion in Nyasaland of the transfer of the undertaking and assets of S.H.R. to the New Company and the said shares shall be transferred to the New Company and the New Company shall allot and issue the ‘A’ Debenture Stock and fully paid shares of the New Company to be allotted and issued in satisfaction of the purchase considerations respectively to the respective parties entitled thereto in accordance with and pursuant to the Conditional Agreement and these presents.

10. Forthwith after the execution of these presents the Government will subscribe and pay for in full at par 1,081,625 ‘A’ Ordinary Shares of 1s. each and as and when required by the New Company in accordance with Clause 16 of the Conditional Agreement the Government will subscribe and pay for at the price of £97 10s. 0d. per cent. £163,250 ‘A’ Debenture Stock in the New Company and the New Company shall on payment being made therefor as aforesaid allot such shares and ‘A’ Debenture Stock to the Government or as it shall direct.

11. Upon completion of the purchase of the said undertaking and assets of S.H.R. and of the said shares of C.A.R. by the New Company and upon the allotment and issue of the shares of the New Company before mentioned the Government shall thereafter from time to time make advances to the New Company of the amounts and for the purposes set out in Clause 26 of the Conditional Agreement and the New Company shall apply such advances as in the Conditional Agreement provided and shall as and when required allot to the Government or its nominees the 5 per cent. Bridge Debenture Stock and/or 5 per cent. ‘B’ Income Debenture Stock of the New Company prescribed by Clause 3 of the Conditional Agreement and C.A.R. shall allot and issue or undertake to allot and issue to the New Company as soon as possible the Debenture or Debentures to be transferred to the Trustees for the said Bridge Debenture Stock as provided in the Conditional Agreement. The New Company and C.A.R. will use their best endeavours to procure T.Z.R. to allot and issue or to undertake to allot and issue to the New Company as soon as possible certain Income Bonds to be transferred to the Trustees for the said Bridge Debenture Stock as provided in Clause 7 of the Conditional Agreement.
12. The New Company and C.A.R. respectively undertake as soon as practicable after the transfer to the New Company of at least 90 per cent. of the shares of each class in the capital of C.A.R. to take the necessary steps for the adoption of new Articles of Association by C.A.R. in the form already approved on behalf of the Government. The New Company and C.A.R. also undertake to take all such further steps as may be required to procure without undue delay the creation and issue by C.A.R. of the said Debenture or Debentures to be transferred to the Trustees of the said Bridge Debenture Stock.

13. The Conditional Agreement shall forthwith after the execution of these presents become absolute and freed from the conditions contained in Clause 29 thereof.

IN WITNESS whereof the Companies have caused their respective Common Seals to be affixed hereto and— one of the Crown Agents for the Colonies has hereunto set his hand and seal the day and year first above written. / ...

_________ Secretary. /
Dated February 1931.

THE CENTRAL AFRICA RAILWAY COMPANY LIMITED
SHIRE HIGHLANDS RAILWAY NYASALAND LIMITED
THE CROWN AGENTS FOR THE COLONIES
AND
NYASALAND RAILWAYS LIMITED.

Agreement OF ADOPTION AND CONFIRMATION OF CONDITIONAL AGREEMENT OF 15th MAY 1930. /

CENTRAL AFRICA RAILWAY COMPANY LIMITED.

To _____

_________

Dear Sir,

I am directed by my Board to enclose a Memorandum relating to the proposed fusion between this Company and the Shire Highlands Railway Nyasaland Limited, the formation of a new Company to be called ‘The Nyasaland Railways Limited’ and the construction and equipment of a Bridge over the Zambesi River and additional lines of Railway. It will be seen from the Memorandum
that a very important development is proposed to be made in connection with
the Railway system connecting Lake Nyasa with the Port of Beira, involving an
expenditure of approximately £3,200,000, which if the Scheme is accepted by
all necessary parties will be provided by the Nyasaland Government on advanta-
geous terms.

The proposal comprises the formation of the Nyasaland Railways Limited
to effect the fusion between the Shire Highlands Railway Nyasaland Limited
(the S.H.R.) and this Company (the C.A.R.), by purchasing the whole of the
Railway and Undertaking of the S.H.R., and liquidating that Company, and
acquiring the whole or at least 90 per cent. of the shares of the C.A.R. from the
present holders.

Under the terms of the Agreement which has been entered into with the
Nyasaland Government, the Shareholders of the C.A.R. are to receive in exchange
for their present holdings the following securities in the New Company, viz.:–

For every Twenty £1 Preference Shares fully paid in C.A.R. £8 five per cent.
‘A’ Debenture Stock and three Ordinary Shares of £1 each fully paid in the New
Company and

For every Four Ordinary Shares of 5s. each fully paid in the C.A.R. One fully
paid Ordinary Share of £1 in the New Company.

In the case of fractions of shares Certificates will be issued or other arrange-
ments made convenient to Holders.

The Directors consider that as the development of the C.A.R. by itself is
difficult without the help of funds far beyond its resources the exchange of the
existing Preference Shares for Debenture Stock and Shares in the New Company
and the existing Ordinary Shares for Ordinary Shares in the New Company
which is to be provided with a very important amount of additional capital
for immediate development will be a beneficial and profitable arrangement for
every holder of Preference or Ordinary Shares in the C.A.R.

The Directors therefore confidently recommend the acceptance of the pro-
posal that you should exchange your present holding of Preference Shares and/or
Ordinary Shares in the Company for the ‘A’ Debenture Stock and/or fully
paid £1 Ordinary Shares in the New Company to which you would be entitled
under the Scheme.

Many of the largest Shareholders in the C.A.R. have already expressed their
intention of accepting the offer for their shares when in due course it is made by
the New Company. I shall be glad if you will signify your acceptance of the terms
to be offered by signing and returning to the Company in the envelope enclosed
the annexed form marked ‘Acceptance of Offer,’ on or before the 28th inst.

By Order of the Board,

3 Thames House, Queen Street Place, C. MacL. CAREY,
17th May, 1930. / Preference Shares. 
Acceptance of Offer. 
1930. 
To the Directors of Central Africa Railway Company, Limited, 
3, Thames House, Queen Street Place, E.C.4. 
Gentlemen, 
I/We acknowledge receipt of your letter of the 17th May, 1930, relating to the proposed fusion between the Shire Highlands Railway, Nyasaland. Limited, and Central Africa Railway Company, Limited, the construction and equipment of a Bridge over the Zambesi River and the construction of additional lines of Railway and which contemplates amongst other things the exchange of the issued Preference Shares and Ordinary Shares in the Central Africa Railway Company, Limited for 5 per cent. ‘A’ Debenture Stock and/or Ordinary Shares in a New Company to be formed to be called ‘The Nyasaland Railways Limited.’ 
As the holder(s) of Preference Shares of —£1 each fully paid of the Company and in consideration of the holders of the whole or at least 90 per cent. of the issued Share Capital of the Company agreeing to exchange their shares on the same terms I/we agree to accept £ — in 5 per cent. ‘A’ Debenture Stock and —Ordinary Shares of £1 each fully paid in the New Company when formed in exchange for my/our said holding of Preference Shares in the Company. 
I/we further agree that upon receipt by me/us of a notification from the New Company that it is prepared to take over my/our said shares and to issue to me/us the 5 per cent. ‘A’ Debenture Stock and Ordinary Shares in the New Company to which I/we shall be entitled for effecting such exchange I/we will execute such transfer or transfers of my/our said Preference Shares in the Company and such other documents in favour of the New Company or as it may direct and do all such other acts and things as may be necessary to carry out the intention of this Agreement. 
Yours faithfully, 
{__________} 
Signature(s) of Holder(s)__________

(in the case of Joint Holders all must sign). / 
CENTRAL AFRICA RAILWAY COMPANY, LIMITED. 
To __________ 
__________ 
__________

Dear Sir,
I am directed by my Board to enclose a Memorandum relating to the proposed fusion between this Company and the Shire Highlands Railway Nyasaland, Limited, the formation of a new Company to be called ‘The Nyasaland Railways Limited’ and the construction and equipment of a Bridge over the Zambesi River and additional lines of Railway. It will be seen from the Memorandum that a very important development is proposed to be made in connection with the Railway system connecting Lake Nyasa with the Port of Beira, involving an expenditure of approximately £3,200,000, which if the Scheme is accepted by all necessary parties will be provided by the Nyasaland Government on advantageous terms.

The proposal comprises the formation of the Nyasaland Railways Limited to effect the fusion between the Shire Highlands Railway Nyasaland, Limited, (the S.H.R.) and this Company (the C.A.R.), by purchasing the whole of the Railway and Undertaking of the S.H.R., and liquidating that Company, and acquiring the whole or at least 90 per cent. of the shares of the C.A.R. from the present holders.

Under the terms of the Agreement which has been entered into with the Nyasaland Government, the Shareholders of the C.A.R. are to receive in exchange for their present holdings the following securities in the New Company, viz.:–

For every Twenty £1 Preference Shares fully paid in C.A.R.
£8 five per cent. ‘A’ Debenture Stock and three Ordinary Shares of £1 each fully paid in the New Company and
For every Four Ordinary Shares of 5s. each fully paid in the C.A.R.
One fully paid Ordinary Share of £1 in the New Company.

In the case of fractions of shares Certificates will be issued or other arrangements made convenient to Holders.

The Directors consider that as the development of the C.A.R. by itself is difficult without the help of funds far beyond its resources the exchange of the existing Preference shares for Debenture Stock and Shares in the New Company and the existing Ordinary shares for Ordinary shares in the New Company which is to be provided with a very important amount of additional capital for immediate development will be a beneficial and profitable arrangement for every holder of Preference or Ordinary Shares in the C.A.R.

The Directors therefore confidently recommend the acceptance of the proposal that you should exchange your present holding of Preference Shares and/or Ordinary Shares in the Company for the ‘A’ Debenture Stock and/or fully paid £1 Ordinary Shares in the New Company to which you would be entitled under the Scheme.

Many of the largest Shareholders in the C.A.R. have already expressed their intention of accepting the offer for their shares when in due course it is made by the New Company. I shall be glad if you will signify your acceptance of the terms
to be offered by signing and returning to the Company in the envelope enclosed
the annexed form marked 'Acceptance of Offer,' on or before the 28th inst.

By Order of the Board,
3, Thames House, Queen Street Place, C. MacL. CAREY,
17th May, 1930. /
Ordinary Shares.
Acceptance of Offer.
1930.
To the Directors of
Central Africa Railway Company, Limited,
3 Thames House,
Queen Street Place, E.C.4.
Gentlemen,
I/we acknowledge receipt of your letter of the 17th May, 1930, relating to
the proposed fusion between the Shire Highlands Railway, Nyasaland, Limited,
and Central Africa Railway Company Limited, the construction and equip-
ment of a Bridge over the Zambesi River, and the construction of additional
lines of Railway and which contemplates amongst other things the exchange of
the issued Preference Shares and Ordinary Shares in the Central Africa Railway
Company Limited for 5 per cent. 'A' Debenture Stock and/or Ordinary Shares
in a New Company to be formed to be called 'The Nyasaland Railways Limited.'

As the holder(s) of — Ordinary Shares of 5s. each fully paid of the Company
and in consideration of the holders of the whole or at least 90 per cent. of the
issued Share Capital of the Company agreeing to exchange their shares on the
same terms I/we agree to accept Ordinary Shares of £1 each fully paid in the
New Company when formed in exchange for my/our said holding of Ordinary
Shares in the Company.

I/we further agree that upon receipt by me/us of a notification from the
New Company that it is prepared to take over my/our said shares and to issue to
me/us the Ordinary Shares in the New Company to which I/we shall be entitled
for effecting such exchange I/we will execute such transfer or transfers of my/
our said Ordinary Shares in the Company and such other documents in favour
of the New Company or as it may direct and do all such other acts and things as
may be necessary to carry out the intention of this Agreement.

Yours faithfully,
Signature(s) of Holder(s), { –
(In the case of Joint Holders all must sign.) /
CENTRAL AFRICA RAILWAY COMPANY, LIMITED.

PREFERENCE SHAREHOLDERS.

*Number of Shares held.*

<table>
<thead>
<tr>
<th>Shareholder</th>
<th>Shares</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arliss, Edward Sydney</td>
<td>4,975</td>
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<tr>
<td>Askham, Stanley James</td>
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<tr>
<td>Bailey, Mrs. Louisa Florence</td>
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<td>Banque d'Outremer</td>
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<tr>
<td>Bargery, Miss Ethel Mary</td>
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<tr>
<td>Beazley, Arthur Stuart</td>
<td>1,826</td>
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<tr>
<td>Beckers, Lucien</td>
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<tr>
<td>Beit, Sir Otto, K.C.M.G.}</td>
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<tr>
<td>d’Erlanger, Baron Frederic</td>
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<tr>
<td>Birchenough, Sir Henry, Bart.</td>
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<tr>
<td>Duke of Abercorn</td>
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<td>Bingham, Miss Eliz. Flora Anne</td>
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<td>Blair, Mrs. Maude Hunter</td>
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<td>Boulton, Sydney Victor</td>
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<td>Braithwaite, Cecil</td>
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<td>Bouvier, Alfred</td>
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<tr>
<td>British Cotton Growing Association, Limited</td>
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<tr>
<td>British South Africa Co., Limited</td>
<td>24,885</td>
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<tr>
<td>Burgess, Miss Winifred Wynne</td>
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<td>Bishopsgate Nominees, Limited</td>
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<td>Calvert, William, &amp; Sons, Limited</td>
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<td>Cito, Nicholas</td>
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<td>Companhia de Mocambique</td>
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<td>Cooper, Mrs. Emma, Exec. of the late H. J. Cooper</td>
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<tr>
<td>Cutler, Alfred William</td>
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<td>Davies, Ernest Seymour</td>
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<td>Derby, The Rt. Hon. Earl of, G.C.V.O.</td>
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<tr>
<td>d’Erlanger, Barons Emile Beaumont,</td>
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<td>Frederick Alfred and Francis Rodolph</td>
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<td>Dickson, Norman Bonnington, O.B.E.,M.I.C.E.</td>
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<tr>
<td>Fairbridge, Miss Laura Vivian</td>
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<tr>
<td>Ferguson Bros., Limited</td>
<td>995</td>
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<tr>
<td>Ferguson, Sydney</td>
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<tr>
<td>Fidden, Edward Brocklehurst</td>
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<tr>
<td>Fox, Francis Douglas</td>
<td>250</td>
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<td>Fox, Miss Agnes Selina</td>
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<tr>
<td>Fox, Francis Douglas</td>
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<tr>
<td>Bradby, Edward H. F</td>
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</tr>
<tr>
<td>Hull, Francis John Kingdom</td>
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<td>Gibb, Robertson Fyffe</td>
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Gilmour, Thomas Lennox 250  
Goffin, Louis 995  
Goodall, A. 8  
Green, James 10  
Hall, Miss Phillis Ellen 25  
Hillier, H. J. 60  
Holland, Miss Mary Blanche 25  
Carried forward 120,651  
Brought forward 120,651  
Horrockses, Crewdson Co., Limited 4,975  
Jackson, Richard Hoyle 500  
Kemp, Henry Herbert 10  
Lake, Mrs. Constance Elizabeth 10  
Lefevre, Leopold 10  
Longuet-Higgins, John Esmond 597  
MacAuslan, Henry Shaw 995  
MacNiel, Mrs. Agnes Burall 100  
Marshall, Frederick Henry 50  
Mellor, Francis Algernon 6,409  
Mellor, Norman Wright 11,433  
Moorgate Nominees, Limited 31,615  
Morisseaux, Charles 198  
Muggeridge, Mrs. Jane H.L. 25  
Barclays Bank (D.C. & O.) Nominees Co. 9,955  
Norman, Miss Rhoda, Ex. of the late E. Norman 50  
Oury, Libert 8,791  
Overton, Nelly 5  
Parsons, William James W. 200  
Pash, Herbert Fisher 25  
Pauling & Co., Limited 138,881  
Penny, Arthur Pawle 100  
Perier, Gaston 1,410  
Phillipson, Franz 995  
Purnell, William John G. 250  
Ravenscroft, James H. 20  
Reynolds, James Philip 200  
Rigg, Charles Matthews 1,334  
Russell, Mrs. Annie Esther 895  
Russell, Mrs. Gladys Howard 1,393  
Schwarzschild, Selig M. 25  
Standard Bank of South Africa 149,332  
Stoolet, Adolphe 1,493  
Telegraph Construction & Maintenance, Co., Limited 2,985  
Thys, Robert Elie Gustave 166  
Thys, Frans Jean Ern. Luc. 165  
Thys, Miss Louise J.A.M. 166  
Upton, Louis James 15
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<tr>
<th>Name</th>
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<tr>
<td>Whittow, Anthony</td>
<td>25</td>
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<td>Wilson, Charles Spinner</td>
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<td>Woolard, Wm. Sinclair</td>
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<td>Woodhouse, Cecil</td>
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<td>Wright, Albert Leslie</td>
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<td>Fox, Francis Douglas</td>
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<tr>
<td>Wright, Henry Fitzherbert</td>
<td>250</td>
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<tr>
<td>Fox, Francis Douglas</td>
<td></td>
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<tr>
<td>Hull, Francis John Kingdom</td>
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<tr>
<td>Holders of Share Warrants to Bearer</td>
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<tr>
<td></td>
<td>500,000</td>
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**ORDINARY SHAREHOLDERS.**

<table>
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<tr>
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<td>Holders of Share Warrants to Bearer</td>
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</tr>
<tr>
<td></td>
<td>100,000</td>
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</tbody>
</table>

CAPE OF GOOD HOPE

A REPORT AND ESTIMATE

BY

MR. A. G. DALTON,

CONCERNING THE

CONSTRUCTION AND EQUIPMENT

OF A

RAILWAY

BETWEEN

OUDTSHOORN & KLIPPLAAT STATION

(*Via WILLOWMORE*), WITH FULL DETAILS.

Presented to both Houses of Parliament by command of His Excellency the Governor.

1894.

[...]

– 259 –
Sir, – I have the honour to advise you that the Survey referred to in your No. 327/5441 of September 14th, 1893, is now completed, and to transmit to you herewith a report on, and Estimates for, the Construction and Equipment of a Railway between Oudtshoorn and Klipplaat Station via Willowmore.

Also Plan and Section of the Centre Line which would have to be staked out before Construction could be commenced.

The total length of the Oudtshoorn-Klipplaat Railway would be approximately 153 miles 72·75 chains.

I was verbally instructed to prepare an estimate for the construction of a cheaper class of line than has hitherto been usual on the Cape Government Railways.

I estimate that, under certain conditions, the line can be constructed for £4,450 per mile.

The total cost being 154 miles at £4,450 per mile – £685,300.

For details of Estimate A see pages No. 12 to Nos. 16. /

I would specially direct attention to the conditions, pages No. 9 to No. 11, on which the Estimate A has been prepared, as unless these are strictly adhered to, the cost of Construction will probably exceed this estimate which includes every cost connected with the line.

It should specially be noted that as nearly a quarter of the whole amount is for cost of permanent way material at Port Elizabeth, the estimate can only be considered approximate as by a slight alteration of the home markets or freight, a considerable difference would be made.

The present is an exceptionally favourable time for purchasing permanent way material, as prices are lower probably than ever before, and a rise is almost certain before long.

The Estimate A, although fairly low, provides – as shown by details pages 12 to 16 – for a line well found in every respect, and capable of dealing with a large amount of traffic.

Should any further accommodation be eventually thought desirable, special authority would have to be given, and the expenditure would not form a charge against the amount – based on this estimate – provided by Parliament for the construction of the line.

The Estimate B on page 16 is for a line with 60lb. rails, &c., equal in every respect to the main line on the Cape Government Railways, the cost would be £6,058 per mile, the total cost being £932,932.
Another Estimate C has been prepared on the chance of second-hand permanent way material being available; the Estimate is based on the same prices as were charged for second-hand permanent way material, on the Midland and Eastern Junction, as no other prices are obtainable.

The Estimate C amounts to £4,046 per mile, or a total cost of £623,081.

The following is a short summary of the Estimates, details of which are given on page 16:

Estimate A – New permanent way material, 45lb. rails, &c., for details see pages 12 to 16:

£4,450 per mile. Total cost £685,300.

Estimate B – New permanent way material, 60lb. rails, everything equal to Cape Government Railways:

£6,058 per mile. Total cost £932,932.

Estimate C – Second-hand light section permanent way material, otherwise same as Estimate A:

£4,046 per mile. Total cost £623,084.

From Oudtshoorn to Klipplaat the following would be the grades:

<table>
<thead>
<tr>
<th>Level</th>
<th>M.</th>
<th>CHS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rising</td>
<td>1 in 40........</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>1 in 41 to 1 in 50.</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>1 in 51 to 1 in 60.</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>1 in 61 to 1 in 80.</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>1 in 81 to Level...</td>
<td>31</td>
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<tr>
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<td></td>
<td></td>
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</table>

Falling

<table>
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<tr>
<th>Level</th>
<th>M.</th>
<th>CHS.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 in 40........</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>1 in 41 to 1 in 50.</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>1 in 51 to 1 in 60.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>1 in 61 to 1 in 80.</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>1 in 81 to Level...</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For further details see page 17.

There would be 123 curves under 10 chains radius with a total length of 8 miles 25 chains made up as follows:

<table>
<thead>
<tr>
<th>2 of 9 chains radius</th>
<th>total length</th>
<th>14.50 chains.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>9 chains</td>
<td>184:00</td>
</tr>
<tr>
<td>19</td>
<td>7 chains</td>
<td>103:20</td>
</tr>
<tr>
<td>16</td>
<td>6 chains</td>
<td>78:50</td>
</tr>
<tr>
<td>56</td>
<td>5 chains</td>
<td>284:80</td>
</tr>
<tr>
<td>123</td>
<td></td>
<td>665:00</td>
</tr>
</tbody>
</table>

It is proposed that check rails should be used on 5 and 6 chains curves.
Taking total cost of line as £685,300
The interest to be paid would be at 3½ per cent., say 24,000
And the cost of working, say 76,000
Making total yearly return required, say £100,000

To earn the £100,000 the following daily average traffic would be necessary:—
Taking number of days in year as 300,
Amount to be earned per day would be £333.
Estimating average rate of carriage per ton at 3d. per mile,
The total length of the line being 154 miles,
The tons required per day over whole distance would be 166 tons.
Or say in each direction 83 tons.
That is 20 fully loaded short flat trucks,1 and a coach containing 2 first-class,
4 second-class, and 10 third-class passengers, passing each way over the whole
distance, for 300 days out of 365, would enable the line to pay interest and working
expenses.

The trucks received and forwarded from the stations of Barroe and
Klipplaat during the year 1893 averaged for 300 days out of the 365 approximately,
two per day, each way. This traffic represents practically the trade of
the district between the Graaff-Reinet line and Willowmore. It may fairly,
therefore, be anticipated that the districts of Oudtshoorn, George and
Uniondale, which are far more thickly populated, will require at least the
desired 18 trucks per day each way to accommodate their trade, and that
all the districts together will contribute the small number of required pas-
sengers.

With regard to the position Oudtshoorn would be in with the Free State
and Transvaal trade, taking Naauwpoort Junction as the common point
it would be 37 miles nearer than Cape Town, or in other words would be
approximately on an equality with Stellenbosch and Paarl.
The present line has been started from a point near the Old Dutch
Church at Oudtshoorn, as this was the selected station site on the through
surveyed line from the westward, but the question of station site would
have to be thoroughly investigated, should construction be decided on, as
it would be advisable to place the station very much nearer the centre of the
town, but this could be done probably without any increased cost.

13. – From Oudtshoorn to Hazenjagh River at 13 miles the line passes
through an easy country, rising 200 feet. A bridge of two openings of 50 feet
each will be required over this river, and 6 feet arches at 3¼ miles, 7¾ miles, and
9¼ miles. A 15 feet arch at 3¾ miles, and a 10 feet arch at 8¾ miles, will also be required. / 

18. – From 13 miles to Le Roux River at 18 miles the country rises 133 feet and is fairly easy. Up to this point the line is located in the valley of the Oliphants River, but leaves it here owing to the heavy Krantzes close to the river. Between the 13th and 18th miles, the principal masonry would be:–

- 10 feet arch at 14¼ miles.
- 6 feet arches at 15½ miles and 16¾ miles.

Bridges of two spans of 50 feet each at 18 miles.

20. – The line as surveyed passes in front of Mr. Du Plessis’ store over a nek and into the valley of the Meirings Poort River; the section about 20 miles shows a considerable amount of work, most of this will be avoided when staking out, by crossing Le Roux River further north and attaining the summit at Hoole’s Nek – 730 feet above Oudtshoorn – by contouring on the slopes of the main foot hills instead of on the spur running south. The descent of about 250 feet on the east side necessitates a fair amount of work and some long and sharp curves.

21¾. – There will be a Bridge of two spans of 20 feet each over Huis River at 21¾ miles; 6 feet arches at 22 miles, 22 miles 10 chains, 22 miles 35 chains, 22 miles 67 chains, and three spans of 30 feet each over Meirings Poort River, the latter being on the skew and on an 8 chain curve.

27. – The line returns to the Oliphant’s River Valley, about 27 miles, the work being fairly easy except in the neighbourhood of Doorn River (26¼ miles), over which a bridge of 30 feet span will be required, the only other masonry of any consequence being a 10’ arch at 24½ miles.

31. – From 27 miles on to near Kruis River (31 miles) the work will be light, but here for a few miles, owing to Krantzes, the line again leaves the Oliphants River Valley, and passes over the same nek as the waggon road, necessitating some rough work and sharp curves. Kruis River itself will be crossed by a Bridge of three spans of 20 feet each, and between 27 miles and 33 miles there will be, in addition, a Bridge of 15 feet span at 27¾ miles, a Bridge of 15 feet at 28¼ miles, a Bridge of three spans of 9 feet each at 29 miles, one of three spans of 9 feet each at 31 miles 8 chains, and arches of 10 feet span at 31 miles 43 chains, and at 32 miles 28 chains.

From 33 miles to 50½ miles the line keeps to the Oliphants River Valley, with over the greater portion fairly easy work.

The principal masonry work required would be:–

<table>
<thead>
<tr>
<th>Description</th>
<th>Miles</th>
<th>Chains</th>
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</thead>
<tbody>
<tr>
<td>1 Bridge of 50 feet span at</td>
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<td>37</td>
</tr>
<tr>
<td>1 “ 30 “ “ ... ...</td>
<td>35</td>
<td>7</td>
</tr>
<tr>
<td>1 “ 20 “ “ ... ...</td>
<td>37</td>
<td>18</td>
</tr>
<tr>
<td>1 “ 2 spans of 20 feet each at</td>
<td>40</td>
<td>16</td>
</tr>
<tr>
<td>1 “ “ “ “ “</td>
<td>43</td>
<td>8</td>
</tr>
</tbody>
</table>
1 “ 20 feet span “ 44 ,, 47 ,,  
1 “ 9 “ “ 45 ,, 53 ,,  
1 “ 30 “ “ 46 ,, 40 ,,  
1 “ 2 spans of 20 feet each at 48 ,, 24 ,,  

50½. – At 50½ miles the line crosses the Oliphants River with a bridge of 4 spans of 100 feet and 1 span of 20 feet. A portion of the bridge would be on cylinders. The site selected is fairly favourable and undoubtedly better than any other for some miles on each side.

53½. – After crossing the river the line runs over easy country to 53½ miles, where somewhat heavy works are necessary at a Krantz, and also at 54¾ miles. The principal bridges will be:— /

<table>
<thead>
<tr>
<th>Type</th>
<th>Span</th>
<th>Length</th>
<th>Miles</th>
<th>Chains</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 span of 30 feet at</td>
<td>... ...</td>
<td>53 miles</td>
<td>18 chains.</td>
<td></td>
</tr>
<tr>
<td>1 arch of 6 feet span at</td>
<td>... ...</td>
<td>53 ,, 56 ,,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1” 10 ” at</td>
<td>... ...</td>
<td>53 ,, 64 ,,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 spans of 20 feet each at</td>
<td>... ...</td>
<td>54 ,, 19 ,,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3” ” ” at</td>
<td>... ...</td>
<td>54 ,, 58 ,,</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

At this point the line is 817 feet above Oudtshoorn.

53¾. – After leaving Wilge River, 54¾ miles, the work would be very light on 56 miles, where there is another bad Krantz; to avoid this the line has been taken over a nek south of the Krantz, but not without some heavy works.

56. – From 56 miles the country opens out, and for some miles is very easy. At about 58 miles the line leaves the Oliphants River Valley and runs through a country giving very light work, except at 59¾ miles and 60¼ miles, where there would be some work and sharp curves to Leeuw Kloof River at 67¾ miles. This river would require a Bridge of two spans of 20 feet each, and the other principal masonry would be:—

<table>
<thead>
<tr>
<th>Type</th>
<th>Span</th>
<th>Length</th>
<th>Miles</th>
<th>Chains</th>
</tr>
</thead>
<tbody>
<tr>
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<td>...</td>
<td>55 mile</td>
<td>78 chains.</td>
<td></td>
</tr>
<tr>
<td>1” ” ” at</td>
<td>... ...</td>
<td>56 ,, 2 ,,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2” 20 feet each at</td>
<td>... ...</td>
<td>56 ,, 58 ,,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1” 20 ” at</td>
<td>... ...</td>
<td>58 ,, 10 ,,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1” 20 ” ”</td>
<td>... ...</td>
<td>59 ,, 4 ,,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1” 10 ” (arch) at</td>
<td>...</td>
<td>60 ,, 13 ,,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1” 20 ” ”</td>
<td>... ...</td>
<td>60 ,, 26 ,,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2” 20 ” each at</td>
<td>...</td>
<td>61 ,, 27 ,,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2” 9 ” ”</td>
<td>... ...</td>
<td>63 ,, 7 ,,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2” 9 ” ”</td>
<td>... ...</td>
<td>67 ,, 9 ,,</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

70¼. – After crossing Leeuw Kloof River the line rises over a small summit with some work and then falls through an easy country to the second crossing of the Oliphants river at 70¼ miles, where 1 span of 100 feet, 1 span of 50 feet, and 1 span of 20 feet will be sufficient opening, a portion being on cylinders.
From here the line keeps along the north side of the river to 76½ miles, the country being as a rule easy, with broken portions at 72 miles and 73¼ miles, but probably when staking out there will be an improvement over this portion. The principal masonry, in addition to Oliphants River Bridge, would be:

<table>
<thead>
<tr>
<th>Opening</th>
<th>Length (feet)</th>
<th>Width (arch)</th>
<th>Distance (miles)</th>
<th>Chains</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 opening</td>
<td>20</td>
<td></td>
<td>68</td>
<td>47</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td></td>
<td>70</td>
<td>58</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td></td>
<td>71</td>
<td>54</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td>(arch)</td>
<td>71</td>
<td>67</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td></td>
<td>73</td>
<td>32</td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td></td>
<td>75</td>
<td>60</td>
</tr>
</tbody>
</table>

76½. – At 76½ miles, Outspan Reserve, 1, 400 feet above Oudtshoorn, the line enters Zuurberg Poort, and rises with a considerable amount of 1 in 40, and numerous sharp curves to the summit at 86½ miles – 2,371 feet above Oudtshoorn 3 – a rise of nearly 1,000 ft. in 10 miles.

There would be a considerable amount of earthwork on this length, although not specially heavy at any one point. The masonry also would be above the average as the line runs on the slopes of the Zuurberg:

<table>
<thead>
<tr>
<th>Opening</th>
<th>Length (feet)</th>
<th>Width (feet)</th>
<th>Distance (miles)</th>
<th>Chains</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 opening</td>
<td>20</td>
<td></td>
<td>80</td>
<td>40</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
<td></td>
<td>81</td>
<td>40</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
<td></td>
<td>84</td>
<td>00</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
<td></td>
<td>84</td>
<td>40</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
<td></td>
<td>86</td>
<td>20</td>
</tr>
<tr>
<td>1</td>
<td>15</td>
<td></td>
<td>79</td>
<td>00</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
<td></td>
<td>82</td>
<td>40</td>
</tr>
</tbody>
</table>

94. – The line from the summit at 86½ miles falls rapidly – 700 feet – to Willowmore at 94 miles over an easy country.

The Station site selected is north-east of the town, and in close proximity to the present main road. There would be a 15 feet arch Bridge at 88 miles, and the river through Willowmore itself would require one span of 40 feet and one of 20 feet.

117½. – From 94 miles to Waai Kraal at 117½ miles, the line passes over a very easy country except for about a mile in Wet Poort (114¾ miles). The principal openings would be:

<table>
<thead>
<tr>
<th>Opening</th>
<th>Length (feet)</th>
<th>Width (feet)</th>
<th>Distance (miles)</th>
<th>Chains</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 opening</td>
<td>30</td>
<td></td>
<td>97</td>
<td>60</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
<td></td>
<td>104</td>
<td>24</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td></td>
<td>104</td>
<td>75</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td></td>
<td>115</td>
<td>11</td>
</tr>
</tbody>
</table>

117½. – At 117½ miles Groot River is crossed by a bridge of 2 spans of 100 feet each. The traverse was taken north of the drift, but the bridge would be built just
south of the drift, where there is an excellent crossing. This point is 1,046 feet above Oudtshoorn and 1,417 feet below the summit on the Zuurberg.

119. – From Groot River the line passes over easy country into the Valley of the Plessis River, and crosses this river at 119 miles with 2 spans of 75 feet each, and follows up the east bank to 128 miles through Naroegas and Swanepoel’s Poorts. A considerable portion of this length is fairly easy, but there would be somewhat heavy work at two Krantzes at 121½ miles and 127½ miles.

The principal masonry on the length would be:–

1 opening of 6 feet (arch) at … 124 miles 17 chains.
1 ” 6 ” ” … 127 ” 17 ”
1 ” 10 ” ” … 127 ” 9 ”

128.– After leaving Swanepoel’s Poort, the line continues to rise over an easy country to a summit at 136¾ miles – 1,700 feet above Oudtshoorn – the principal openings being:–

1 opening of 20 feet at … … 131 miles 8 chains.
2 ” 9 ” ” … … 135 ” 50 ”

and then falls, the country being very easy to the Junction with the Graaff-Reinet line near Klipplaat Station.

The masonry will be:–

4 openings of 9 feet each at … 137 miles 32 chains
2 ” 20 ” ” … 139 ” 70 ”
3 ” 9 ” ” ” … 140 ” 44 ”
4 ” 9 ” ” ” … 144 ” 47 ”
4 ” 20 ” ” ” … 151 ” 25 ”
3 ” 50 ” ” ” … 151 ” 45 ”
4 ” 9 ” ” ” … 152 ” 70 ”
2 ” 9 ” ” ” … 153 ” 66 ”

154. – The Junction point, at 153 miles 72-75 chains from Oudtshoorn and 123 miles 60-66 chains from Port Elizabeth, is 2,077 feet above sea level, and 1,028 feet above Oudtshoorn, and is just north of the 30 feet Bridge about half a mile north of the Klipplaat Station.

The line has been located and graded to give light work, but notwithstanding this, as shown by the details of the estimate, the earthwork would cost £703 per mile. The masonry also is a heavy item, £752 per mile; all the Bridges and Culverts being, however, of the same class, as on the main line, they will cause no expense in the future should the traffic require heavier engines, &c. / Ballast will as a rule be plentiful and good.

Building stone is scarce except in a few places, therefore it is intended to use concrete to a great extent for Bridges and Culverts.
Excellent water is found south of the Zwartberg Range – Oudtshoorn to 86 miles – but north of the range to Klipplaat good water, as is usual in the Karroo, is not obtainable; although of a certain quality a fair supply will probably be procurable.

I have heard indirectly that there is a probability of the Klipplaat Outspan, on which the Junction will be situated, being sold before long, and would suggest the advisability of reserving the land required for Railway purposes.

The staff, consisting of Mr. A. M. Shaw, District Engineer; Mr. J. G. Hallack, Acting District Engineer; and Messrs. G. R. Whitaker, A. Heatlie, E. A. Childe, and E. Simpkin, Assistant Engineers, collected at Oudtshoorn early in October, 1893. Fieldwork commenced October 9th and was completed January 8th, and the office work was finished and the staff disbanded at end of February.

The amount allowed for Survey was £4,000.

The total expenditure to the end of February was £2,695 7s. 9d., and as the future charges will be small, there will be a considerable alance.

I have the honour to be,

Sir,

Your obedient Servant,

(Signed.) ALAN GRANT DALTON,

Resident Engineer.

OUDTSHOORN-KLIPPLAAT – 154 MILES.

Conditions on which a line could probably be constructed between Oudtshoorn and Klipplaat for £4,450 a mile. (See pages 12 to 16 for details of estimate).

Grade. – Ruling grade to be 1 in 40.

Curves. – Radius of 5 chains to be allowed, but if possible the grade will be reduced on curves of 8 chains radius and under.

Speed. – Limited to 15 miles per hour.

Staff. – The Resident Engineer to be consulted on the appointment of every member of his staff, and to be given as free a hand as possible.

The members of the staff, representing every Department, to be directly under the Resident Engineer’s control, and every one coming on the works, to take instructions only through the Resident Engineer.

Contracts. – Work to be let in the same manner as on the Kimberley-Vryburg Railway, that is to a great extent work to be let by verbal agreements between the Engineers and Contractors – the Resident Engineer being final arbitrator in all disputes on the works – his decision to be without appeal.

Opening. – The opening of the line for traffic not to be hurried, so that no high expenditure on temporary structures may be incurred, and no interference with economical ballasting.
Use of Line during Construction. – As completion of the line is sufficiently advanced, construction to have authority to carry passengers, parcels and goods entirely without risk. / Line to be opened to Willowmore when ready, but to be maintained and worked by Construction, and Construction to get all receipts, a special tariff being arranged.

Passengers and goods to be re-booked at Klipplaat.

Survey. – The estimate is for the staking out of the centre line, and other expenses that may be incurred after the Construction of the line has received the sanction of Parliament.

Expropriation. – £80 per mile has been allowed, but this amount must be taken as only approximate.

Fencing. – The line is to be fenced in on both sides, through all farms completely fenced at the time of the Survey.

The total fenced line at present is about 35 miles, another 20 miles has been allowed for against compensation.

The fencing estimated for is Sneeze, Olive or other good hard-wood poles 6¢ 6² to 7¢ 0² long, 3½² diameter at small end, placed 30¢ apart on easy curves and straights, distance reduced on rough ground, neighbourhood of stations, &c.

Straining posts about every 200 yards with eye bolts and wire ties. Wire No. 6 steel for 2 wires, No. 7 steel for 4 wires, laced every 3 feet with double No. 10 steel wire, poles to be 2¢ in ground and 4¢ 6² above.

Supervision, Head Office, &c. – The head office expenditure on the Midland and Eastern Junction amounted to about £20 per mile; the same amount has been included in present estimate.

Temporary Works. – The amount allowed under this heading is small on the assumption that it will not be necessary to push on the works so rapidly as to entail heavy expenditure on temporary bridges, &c.

Earthworks. – Ordinary formation width to be 12 feet increased to 14¢ on banks of 10¢ and over, and possibly in some cuttings. All cesses to be 8 feet wide to allow of banks being economically increased in width hereafter.

Bridges and Culverts. – Superstructures to be equal to those on Main Line (same type as on Midland and Eastern Junction). Cylinders will be used on portions of the Oliphant’s River Bridge, and cement concrete will be freely used in place of masonry owing to the scarcity in many places of good building stone.

Gradient and Distance Posts and Level Crossings. – Posts constructed of old rails; gradient arms sheet iron; distant discs cast iron. Level crossings with guard rails, &c., as usual.

Permanent Way. – Rails to be 45lb. new steel. Sleepers on straights and curves of 10 chains radius and over to be steel, 70lbs. each – costing in Port Elizabeth about 4s. 6d. each; 1,980 to be laid to the mile.
On curves under 10 chains radius, wooden sleepers to be used, Colonial if they can be supplied at the same price and of the same quality as imported.

**Fastenings.** – New.

**Points and Crossings.** – New. Curves of 5 and 6 chain radius to have check rails.

The price of rails has been supplied to me as the present price on trucks in Port Elizabeth, and that of sleepers is about the approximate price of those recently imported for the Mafeking line. These prices are, of course, liable to large and sudden fluctuations. / 

**Ballasting.** – Rail level to be 12 inches above formation instead of 18 inches as is usual on the Cape Government Railways.

**Note:**– On light work in the Karroo the quantity of Ballast may be still further reduced at the discretion of the Resident Engineer.

**Stations and Buildings.** – Earthworks, permanent way, material and ballasting at Stations and Sidings is not included under this heading, but only accommodation, &c., for the Locomotive and Traffic Departments.

The type drawings show the class of buildings, and give full details of everything that has been included in the estimate.*

All dwellings, offices, &c., will consist of wooden huts, either erected singly or grouped together. Many of these huts will be used by officers during construction.

Huts placed at sites that are practically certain to be permanent will be erected on rough stone foundations, others on hardwood stumps.

Iron tanks on masonry have not been included for engine watering stations, as the wooden construction tanks on ‘old rails’ or other substantial supports will last for many years. Hand pumps and windmills are included for the Water Stations.

**Platelayers Cottages.** – To be erected every five miles, and as they are required permanently, the exterior walls will be built of rough masonry, using any stone in the neighbourhood that will not weather; interior walls of wood, wooden sills, lintels, &c., and no dressed quoins.

**Telegraph.** – For 113 miles, new poles, &c., will be required on the remaining 41 miles (0 miles to 23 miles and 76 to 94 miles) the poles now erected will only require to be moved to the neighbourhood of the line. Special telegraph officers have not been included as it is intended that the instruments should be placed in the Stationmaster’s Offices. No Post Offices or Post Office fittings are included in the estimate.

**Maintenance.** – No Maintenance to be charged against Construction from the date of the opening of the line through Oudtshoorn, but Construction after that date to bear only the cost of completing purely Construction items.
‘Construction’ to bear cost of maintaining the portions of the line that may be opened as completed, but such portions are to be worked by, and the proceeds placed to the credit of ‘Construction.’

At the date of the opening through to Oudtshoorn, an estimate to be made by the Resident Engineer of the cost of completing Construction items, the cost of everything not included in such estimate, to be charged to and paid for by Maintenance.

**Rolling Stock.** – As the specified speed is limited to 15 miles an hour, undoubtedly the line will be worked with Rolling Stock, of which I understand there is every probability of there being an ample supply available shortly, that has fallen out of date on the main line, but is suitable for branch line traffic. The estimate, therefore, for Rolling Stock has been placed at £300 per mile, which will be ample. /

| ESTIMATE A (Per Mile of Main Line for Oudtshoorn-Klipplaat Railway) |
|-------------------------|-----------------|-----------------|
| Survey                  | £.       | s.       | d.       |
| 154 miles at £30        | 4,620    | 0        | 0        |
| Expropriation           |          |          |          |
| 154 miles at £80        | 12,320   | 0        | 0        |
| Fencing                 |          |          |          |
| 35 miles double fencing at £150 | 5,250  | 0        | 0        |
| 20 " extra " £150       | 3,000    | 0        | 0        |
| 110 pairs of 14 gates at £23 | 2,530  | 0        | 0        |
| Cattle stops, 154 miles at £10 | 1,540  | 0        | 0        |
| Supervision             |          |          |          |
| 154 miles at £10        | 15,400   | 0        | 0        |
| Temporary Works         |          |          |          |
| 154 miles at £100       | 15,400   | 0        | 0        |
| Earthworks              |          |          |          |
| 6,415 chs. forming at 35s. a chain, say Banks, 589100 | 11,226  | 0        | 0        |
| 876,261 c. yds. at c. at 2s. 1d., say Cuttings 296,161 | 91,227  | 0        | 0        |
| Retaining walls 847 c. yds. at 50s., say 2,000 chs. of catch water drains at 5s. | 2,117   | 0        | 0        |
| 30,000 c. yds. earthwork in Stations and Sidings at 2s. 1d. | 3,125   | 0        | 0        |
| Bridges and Culverts    |          |          |          |
| Masonry and Concrete in excavations, 33,321 c. yds at 50s. | 83,303  | 0        | 0        |
| Superstructures, 1,308 tons at £23 | 30,084  | 0        | 0        |
| Cylinders, various, say 100 tons at £23 | 2,300   | 0        | 0        |
| Earthenware pipes 12’ set, 720 lin. ft @ 4s. | 144     | 0        | 0        |
|                        | 108,195  | 0        | 0        |
|                        | 3,125    | 0        | 0        |
|                        | 83,303   | 0        | 0        |
|                        | 30,084   | 0        | 0        |
|                        | 2,300    | 0        | 0        |
|                        | 144      | 0        | 0        |
|                        | 115,831  | 0        | 0        |
Dalton, A Report and Estimate Concerning the Construction of a Railway

Gradient Posts, Mile Posts, and Level Crossings.

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gradient and Distant Posts, 1,450 at 20s.</td>
<td>1,450</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Level Crossings, 350 at £20</td>
<td>7,000</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Permanent Way.

**Main Line.**

- Rails, 45lb. steel, at Port Elizabeth, 10,934 tons at £6.
  - £65,604 0 0
- Fastenings, at Port Elizabeth, 500 tons at £15
  - £7,500 0 0
- Trough Sleepers, 70lb., at Port Elizabeth, 9,052 tons at £8.
  - £72,416 0 0
- 14,080 Wooden Sleepers for sharp curves at 6s.
  - £4,224 0 0
- Check Rails on 5 and 6 chain curves at Port Elizabeth, 320 tons at £6...
  - £1,920 0 0

**Sidings.**

- Rails, 45lb. steel, at Port Elizabeth, 426 tons at £6
  - £2,556 0 0
- Fastenings, at Port Elizabeth, 20 tons at £15
  - £300 0 0
- Trough Sleepers, 70lb., at Port Elizabeth, 370 tons at £8
  - £2,960 0 0
- 80 sets of Points and Crossings, at Port Elizabeth, £33
  - £2,640 0 0
- 20,000 length of Crossing Sleepers, at Port Elizabeth at ls.
  - £1,000 0 0

Carried forward 292,536 0 0
Brought forward 292,536 0 0

**Ballasting.**

- Main Line, 1, 232 chs. at £4
  - £49,280 0 0
- Sidings, 480 chs. at £4
  - £1,920 0 0
- Extra between Roads at Stations, 20,000 c yds. at 3s.
  - £3,000 0 0

Expenses on putting in Points and Crossings, 80 at £10
  - £213,070 0 0

Expenses on linking in 12, 800 chs. at 30s.
  - £19,200 0 0

Expenses on putting in Points and Crossings, 80 at £10
  - £213,070 0 0

Carriage to Klipplaat and distribution, 25,560 tons at 25s.
  - £31,950 0 0
### Stations and Sidings, Loco. and Traffic Accommodation.

N. B. – Earth Work, Per. Way, and Ballasting included under other heads.

**Oudtshoorn.**

<table>
<thead>
<tr>
<th>Description</th>
<th>£s.</th>
<th>d.</th>
<th>£s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger Station, Sketch A, price not to exceed</td>
<td>950</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>400’ Low Level Platform and timber face, not to exceed</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>50' × 25' Cor. Iron Goods Shed on trestles, not to exceed</td>
<td>450</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>15 × 15' Cor. Iron Goodsroom on Platform, not to exceed</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>200' Timber Loading Platform on trestles, not to exceed</td>
<td>300</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>10' × 10' Cor. Iron Urinal, cement floor, not to exceed</td>
<td>150</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>10' × 8' Cor. Iron Lamproom, cement floor, not to exceed</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cattle Kraal, deal faced, old rail fencing, not to exceed</td>
<td>200</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Wagon Landing, deal faced, not to exceed</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1 Night Foreman’s house (see sketch, page 37), not to exceed</td>
<td>470</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2 Clerks’ houses (see sketch, page 37), not to exceed</td>
<td>660</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2 Guards’ houses (see sketch, page 37), not to exceed</td>
<td>660</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2 Porter’ houses (see sketch, page 38), not to exceed</td>
<td>400</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Distant and Home Signals</td>
<td>70</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3 Wells or underground tanks, not to exceed</td>
<td>200</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3 Stop Blocks, name and warning boards, not to exceed</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1 mile of Wire Fencing, Gates, &amp;c., not to exceed Metalling, &amp;c.</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Fittings and equipment for traffic, not to exceed</td>
<td>300</td>
<td>0</td>
<td>5,510</td>
<td>0</td>
</tr>
</tbody>
</table>

**9 Miles (about). Siding.**

1 Stop Block, 2 Name, and 2 Warning Boards 18 Miles (about). Small Station (Le Roux River).

<table>
<thead>
<tr>
<th>Description</th>
<th>£s.</th>
<th>d.</th>
<th>£s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger Station and Office (see sketch, page 36), not to exceed</td>
<td>530</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Cost</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cor. Iron Goodsroom on Platform 15’ by 15’, not to exceed</td>
<td>100  0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cor. Iron Urinal 10’ x 10’, cement floor, not to exceed</td>
<td>150  0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cattle Kraal as at Oudtshoorn, not to exceed</td>
<td>200  0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Level Platform, 200’ timber face, not to exceed</td>
<td>50   0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carried forward</td>
<td>565,366 0 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 Loading Platform, timber on trestle, not to exceed</td>
<td>100  0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well or underground tank, not to exceed</td>
<td>100  0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Distant Signals with levers at station buildings</td>
<td>80   0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Stop Block, Name and Warning Board</td>
<td>50   0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>½ mile of Fencing, not to exceed</td>
<td>50   0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metalling Platform, &amp;c., not to exceed</td>
<td>100  0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fittings and equipment for traffic, not to exceed</td>
<td>200  0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 Miles (about). Siding. – With accommodation.</td>
<td>1,710 0 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrugated Iron Shelter, not to exceed</td>
<td>80   0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100’ Low Level Platform ” “</td>
<td>50   0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20’ Loading Platform ” “</td>
<td>70   0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stop Block, Name and Warning Board</td>
<td>50   0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metalling and Sundries</td>
<td>50   0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36 Miles (about). Vlaakte-Plaats. Small Station. – As at 18 miles</td>
<td>1,710 0 0</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>46 Miles (about). Siding. – With accommodation as at 27 miles</td>
<td>300  0</td>
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<tr>
<td>56 Miles (about.) Siding – As at 9 miles.</td>
<td>50   0</td>
<td></td>
<td></td>
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<tr>
<td>65 Miles (about). Uniondale Road. Small Station – As at 18 miles</td>
<td>1,710 0 0</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>75 Miles (about.) Siding. – As at 9 miles ..</td>
<td>50   0</td>
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<tr>
<td>87 Miles (about). Summit of Zuurburg. Siding. – As at 9 miles</td>
<td>50   0</td>
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<td></td>
<td></td>
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<tr>
<td>94 Miles (about). Willowmore.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Passenger Station (see sketch), not to exceed</td>
<td>700  0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200’ Low Level Platform, timber faced, not to exceed</td>
<td>50   0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cor. Iron Goods Shed, 30’ x 15’, not to exceed</td>
<td>350  0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside Platform, 100’ x 15’, not to exceed</td>
<td>150  0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cor. Iron Goods Room on Platform, 15’ x 15’, not to exceed</td>
<td>100  0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cor. Iron Urinal, 10’ x 10’, cement floor, not to exceed</td>
<td>150  0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cor. Iron Lamp Room 10’ x 8’, cement floor, not to exceed</td>
<td>200  0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cattle Kraal, as at Oudtshoorn, not to exceed</td>
<td>50   0</td>
<td></td>
<td></td>
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</table>

Dalton, A Report and Estimate Concerning the Construction of a Railway 273
<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Night Foreman’s house (see sketch), not to exceed</td>
<td>470</td>
</tr>
<tr>
<td>1 Porter’s house (see sketch), not to exceed</td>
<td>200</td>
</tr>
<tr>
<td>Well or underground tank, ” ”</td>
<td>100</td>
</tr>
<tr>
<td>2 Distance Signals, lever at station</td>
<td>80</td>
</tr>
<tr>
<td>Stop Block, Name and Warning Board, not to exceed</td>
<td>50</td>
</tr>
<tr>
<td>½ mile of Fencing, &amp;c., not to exceed</td>
<td>50</td>
</tr>
<tr>
<td>Metalling, Platform, &amp;c.</td>
<td>100</td>
</tr>
<tr>
<td>Fittings and equipment for traffic, not to exceed</td>
<td>250</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,100</strong></td>
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<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>106 Miles (about). <em>Siding</em> – As at 9 miles ..</td>
<td>50</td>
</tr>
<tr>
<td>118 Miles (about). <em>Waai Kraal, Siding</em> – With accommodation as at 27 miles</td>
<td>300</td>
</tr>
<tr>
<td>129 Miles (about). <em>Swanepoel’s Poort, Small Station</em> – As at 18 miles</td>
<td>1,710</td>
</tr>
<tr>
<td>141 Miles (about). <em>Siding</em> – As at 9 miles</td>
<td>50</td>
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<tr>
<td>Klipplaat Junction</td>
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</tr>
<tr>
<td>Low Level extra Platform, not to exceed</td>
<td>100</td>
</tr>
<tr>
<td>Office for Stationmaster, Gentlemen’s Waiting Room, Refreshment Room, &amp;c. (see sketch, Page 35), not to exceed</td>
<td>550</td>
</tr>
<tr>
<td><strong>Carried forward</strong></td>
<td><strong>576,456</strong></td>
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</tbody>
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<table>
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<tr>
<th>Description</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Brought forward</td>
<td><strong>576,456</strong></td>
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<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galvd. Iron Goods Room on Platform, not to exceed</td>
<td>100</td>
</tr>
<tr>
<td>Galvd. Iron Lamp Room, cement floor, not to exceed</td>
<td>100</td>
</tr>
<tr>
<td>Night Foreman’s quarters (see sketch, page 37), not to exceed</td>
<td>470</td>
</tr>
<tr>
<td>2 Clerks’ quarters (see sketch, page 37), not to exceed</td>
<td>660</td>
</tr>
<tr>
<td>2 Guards Houses</td>
<td>660</td>
</tr>
<tr>
<td>2 Porters’ houses (see sketch, page 38), not to exceed</td>
<td>400</td>
</tr>
<tr>
<td>Laying on water from tank, not to exceed</td>
<td>100</td>
</tr>
<tr>
<td>7 Signals ” ”</td>
<td>200</td>
</tr>
<tr>
<td>Stop Block, Name and Warning Board, not to exceed</td>
<td>100</td>
</tr>
<tr>
<td>Metalling, &amp;c., not to exceed</td>
<td>200</td>
</tr>
<tr>
<td>Fencing, &amp;c, ” ”</td>
<td>100</td>
</tr>
<tr>
<td>Fitting and equipment for traffic, not to exceed</td>
<td>300</td>
</tr>
<tr>
<td><strong>Loco, Requirements at Oudtshoorn.</strong></td>
<td><strong>4,040</strong></td>
</tr>
<tr>
<td>Cor. Iron Engine Shed, 4 engines, concrete floor and pits, not to exceed</td>
<td>800</td>
</tr>
<tr>
<td>1 Outside pit, not to exceed</td>
<td>100</td>
</tr>
<tr>
<td>Driver-in-charge, quarters (see sketch), not to exceed</td>
<td>470</td>
</tr>
<tr>
<td>2 Drivers’ quarters (see sketch, page 37), not to exceed</td>
<td>660</td>
</tr>
<tr>
<td>2 Firemen’s quarters (see sketch, page 38), not to exceed</td>
<td>540</td>
</tr>
<tr>
<td>2 Cleaners’ quarters (see sketch, page 39), not to exceed</td>
<td>50</td>
</tr>
<tr>
<td>Description</td>
<td>Cost (£)</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Cor. Iron Store, 15' x 10', not to exceed</td>
<td>100</td>
</tr>
<tr>
<td>1 Coal Stage, timber, ’’ ’’</td>
<td>150</td>
</tr>
<tr>
<td>1 45' Turntable or triangle, ’’ ’’</td>
<td>900</td>
</tr>
<tr>
<td>½ mile of Fencing, ” ”</td>
<td>50</td>
</tr>
<tr>
<td>Wells or laying on water, ” ”</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td>4,000</td>
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</tbody>
</table>

**Loco, Requirements at Klipplaat.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver-in-charge (see sketch, page 37), not to exceed</td>
<td>470</td>
</tr>
<tr>
<td>3 Drivers’ quarters (see sketch, page 37), not to exceed</td>
<td>990</td>
</tr>
<tr>
<td>3 Firemen’s quarters (see sketch, page 38), not to exceed</td>
<td>810</td>
</tr>
<tr>
<td>3 Cleaners’ quarters (see sketch, page 39), not to exceed</td>
<td>70</td>
</tr>
<tr>
<td>1 Fitter’s quarters (see sketch, page 38), not to exceed</td>
<td>270</td>
</tr>
<tr>
<td>Repairs and Additions to Engine Shed, not to exceed</td>
<td>500</td>
</tr>
<tr>
<td>1 Outside pit, not to exceed</td>
<td>100</td>
</tr>
<tr>
<td>Corrugated Iron Store, not to exceed.</td>
<td>100</td>
</tr>
<tr>
<td>Turntable, if considered absolutely necessary</td>
<td>900</td>
</tr>
<tr>
<td>Fencing, &amp;c., &amp;c., not to exceed</td>
<td>100</td>
</tr>
<tr>
<td>Laying on water, ” ”</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>4,410</td>
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</tbody>
</table>

**Loco Requirements – Positions to be decided.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 3,000 gal. Wooden Construction Tanks with stands in good order, not to exceed</td>
<td>800</td>
</tr>
<tr>
<td>4 Suitable Hand-Pumps, with sheds, not to exceed</td>
<td>400</td>
</tr>
<tr>
<td>4 Windmills, not to exceed</td>
<td>600</td>
</tr>
<tr>
<td></td>
<td>4,400</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carried forward</td>
<td>588,906</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Ash pits, not to exceed</td>
<td>400</td>
</tr>
<tr>
<td>4 Pumpers’ houses (see sketch, page 38), not to exceed</td>
<td>800</td>
</tr>
<tr>
<td>Fencing, &amp;c., not to exceed</td>
<td>200</td>
</tr>
<tr>
<td>Up to 2 miles of various pipes, not to exceed</td>
<td>700</td>
</tr>
<tr>
<td>Sundries not to exceed</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>4,400</td>
</tr>
</tbody>
</table>

**Platelayer’s Cottages.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rough Stone Cottages (see sketch, page 39), 31 at £320</td>
<td>9,920</td>
</tr>
<tr>
<td>Wire Fencing for, 31 at £20</td>
<td>620</td>
</tr>
<tr>
<td>Wells or underground tanks, 31, at £50</td>
<td>1,550</td>
</tr>
<tr>
<td>Tanks and Stands, 31 at £50</td>
<td>465</td>
</tr>
<tr>
<td>Corrugated Iron W.C’s, 31 at £5</td>
<td>155</td>
</tr>
<tr>
<td>” ” Native quarters, 31 at £50</td>
<td>1,550</td>
</tr>
<tr>
<td>Work and Permanent Way Inspectors (see sketch), 4 at £470</td>
<td>1,880</td>
</tr>
<tr>
<td>Wells, Fencing, Tanks, &amp;c., 4 at £100</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>16,540</td>
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</tbody>
</table>

**Telegraph**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>154 miles at £70</td>
<td>10,780</td>
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**Maintenance During Construction.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (£)</th>
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</thead>
<tbody>
<tr>
<td>154 miles at £120</td>
<td>18,480</td>
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</table>
Rolling Stock.
154 miles at £300

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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>£</td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td>Survey</td>
<td>30</td>
<td>30</td>
<td>30</td>
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<tr>
<td>Expropriation</td>
<td>80</td>
<td>80</td>
<td>80</td>
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<tr>
<td>Fencing</td>
<td>80</td>
<td>100</td>
<td>80</td>
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<tr>
<td>Supervision</td>
<td>100</td>
<td>100</td>
<td>100</td>
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<tr>
<td>Temporary Works</td>
<td>100</td>
<td>100</td>
<td>100</td>
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<td></td>
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<tr>
<td>Earthworks</td>
<td>703</td>
<td>850</td>
<td>703</td>
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<tr>
<td>Bridges and Culverts</td>
<td>752</td>
<td>752</td>
<td>752</td>
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<tr>
<td>Grade Posts, &amp;c.</td>
<td>55</td>
<td>55</td>
<td>55</td>
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<tr>
<td>Permanent Way</td>
<td>1384</td>
<td>2021</td>
<td>980</td>
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<td>Ballasting</td>
<td>352</td>
<td>502</td>
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<td>1736</td>
<td>2523</td>
<td>980</td>
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<tr>
<td>Station Buildings, &amp;c.</td>
<td>217</td>
<td>360</td>
<td>217</td>
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<tr>
<td>Platelayers’ Cottages, &amp;c.</td>
<td>107</td>
<td>154</td>
<td>107</td>
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<tr>
<td>Telegraph</td>
<td>70</td>
<td>84</td>
<td>70</td>
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<tr>
<td>Maintenance during Construction</td>
<td>120</td>
<td>120</td>
<td>120</td>
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<td>Maintenance, 1 year</td>
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<tr>
<td>Rolling Stock</td>
<td>300</td>
<td>630</td>
<td>300</td>
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<td>4450</td>
<td>6058</td>
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### GRADES – CUDTSHOORN TO KLIPPLAAT

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<th>Miles</th>
<th>Level</th>
<th>Rising</th>
<th>Falling</th>
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<td></td>
<td>Miles</td>
<td>1/40</td>
<td>1/50</td>
</tr>
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<td>0 to 10</td>
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<td>0.59</td>
<td>0.54</td>
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<td>20 to 30</td>
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<td>30 to 40</td>
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<td>40 to 50</td>
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<td>50 to 60</td>
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<td>170 to 180</td>
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<td>19.71</td>
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<td>270 to 280</td>
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<td>290 to 300</td>
<td>22.41</td>
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<td>300 to 310</td>
<td>23.31</td>
<td>23.31</td>
<td>23.31</td>
</tr>
<tr>
<td>310 to 320</td>
<td>24.21</td>
<td>24.21</td>
<td>24.21</td>
</tr>
</tbody>
</table>

Dalton, A Report and Estimate Concerning the Construction of a Railway 277

CAPE OF GOOD HOPE.

REPORT AND ESTIMATE

IN CONNECTION WITH

CALEDON SURVEYS

WITH A VIEW TO THE CONSTRUCTION OF A LINE OF RAILWAY.

MADE BY G. S. OWEN DURING 1896 AND 1897.

Presented to both Houses of parliament by command of his Excellency the Governor.

[...]
Sir, – I have the honour to transmit to you

1. Plans, sections, and estimate of the proposed railway from Sir Lowry’s Pass station, via Houw Hoek, Caledon, Swellendam, Zuurbraak and Heidelberg to Riversdale.

2. Similar particulars for an alternative route from Klapmuts to Caledon, via French Hoek and Bot River, joining the above survey on the farm Boontjes Kraal, 9 miles 18 chains of Caledon.

3. Small scale plan showing the direction of the above surveys.

The line from Boontjes Kraal as far as the Northern end of the French Hoek tunnel, has been surveyed by my Staff. Thence to Klapmuts, the previous survey and estimate of Mr. Shaw have been adopted.

For convenience of reference the estimates have been divided into four parts.

1. Sir Lowry’s Pass to Caledon.
2. Klapmuts to Caledon.
3. Caledon to Swellendam.
4. Swellendam to Riversdale.

The estimates are framed on earthworks of the light type of Railway recently authorised by Parliament, new steel rails, 60 lbs. per yard, 3ft. 6in. gauage, wooden sleepers, and stations similar to those adopted on the Graaff-Reinet-Middleburg Railway, and include all the necessary works such as:–

- Earthworks
- Fencing throughout.
- Bridges.
- Culverts.
- Locomotive requirements.
- Telegraph.
- Rolling stock.
- Permanent Way and Ballast.
- Stations.
- Platelayers’ Cottages.
- Expropriation, and / Sums of 5% for contingencies and 5% for raising the loan.

The total distances are:–
Sir Lowry’s Pass to Caledon

Commencing at the present terminus at Sir Lowry’s Pass Station, the line contours up, until it crosses the main road to Caledon on the level, about half a mile above the station; thence it contours up the slope of the Hottentot’s Holland Mountains, keeping on the north side of the road to a point above the toll-bar, about half a mile from the summit of the pass; here it crosses under the road, and, running immediately below it, passes under the summit with a tunnel 203 yards long.

The grade from the Station to the summit is chiefly 1 in 40.

After leaving the summit, the post road is again crossed on the level, and twice again before the Steinbrass River is reached; thence it diverges considerably to the north, and contouring down on a 1 in 40 grade, crosses the Palmiet River and adjoining valley, about a mile above the present road bridge.

At the Palmiet River four span of 100 feet have been provided.

In close proximity to this bridge, and about half a mile from the road bridge, a station site for the Palmiet River and adjoining farms has been selected.

From here, the line gradually rises to the next watershed above Knoplocks Kraal River, and descending, crosses the river at the farm De Rust, about one mile above and to the north of the present road bridge; from here it contours up, generally on a 1 in 40 grade, to the watershed above Mr. Jackson’s homestead, the commencement of the Houw Hoek Pass.

The main road is here crossed on the level, and the line, now on the south side of the road, commences the descent on a 1 in 40 grade towards the Bot River, keeping to the south of Houw Hoek Hotel, where a station is provided for; a short distance east of the hotel, the road is again crossed and the northern bank of the Jackalls River reached.

Klapmutts Junction to Caledon

Caledon to Swellendam

Swellendam to Riversdale

Cape Town, via Sir Lowry’s Pass to Caledon

Cape Town, via French Hoek to Caledon

Cape Town, via Sir Lowry’s Pass to Riversdale

Cape Town, via French Hoek to Riversdale

GENERAL DESCRIPTION OF ROUTE.

Sir Lowry’s Pass to Caledon.
Here the most difficult part of the Pass occurs, and the Jackalls River is crossed twice on viaducts, each 300 feet long, thence, running immediately below the post road, to the bottom of the Pass, where it crosses the post road on the level, and after considerable detour to the south returns, re-crossing the road immediately above the houses at the Bot River. Shortly after this the Jackalls River is finally crossed, then the Bot River, about half a mile above the present bridge.

From the Bot River, a long gradient of 1 in 40 brings the line to the north of the post stables at Lange Hooghte, whence it descends on a 1 in 40 grade, on the north of the post road, to the Zwaart River at Boontjes Kraal.

From this point it keeps still on the north-side of the road, till reaching Zee-koe Gat, crosses the road, and passes up the valley of the Bath River to Caledon station which has been placed close to the Vley, below the town. The heaviest work occurs for two miles south of Sir Lowry’s Pass, and two miles in the Houw Hock Pass.

**Caledon to Swellendam.**

On leaving Caledon station, the line keeps close to the south side of the post road, till nearing Mr. Metcalf’s farm; here it takes a sharp bend to the right, passing about one mile to the south of the homestead. Between this and Drayton, the road is crossed three times, and the line, running about ¾ mile to the north of the homestead, passes about half a mile to the north of Spielman’s River, and recrosses the road at about two miles east of the latter homestead; thence it runs to the head waters of the Droogas River, leaving the homestead at Zandfontein about two miles to the left.

The north bank of the Droogas River is followed to Mr. Philips’ house, near which a station is provided, and the Droogas River crossed just below the homestead.

Thence the line continues on the east bank of the Droogas River, to its junction, with the River Zonder End, at Schuitsberg.

From this junction the line keeps on the south bank of the River Zonder End as far as its junction with the Breede River, leaving the Post Office Zonder End, where a station is provided, the main homestead of the Drooge Boom, Tygerhoek, Appels Kraal, near which a station is provided, on the left, and Groote Vlaakte on the right; thence passing close to the south of Stormsvlei homestead, where a station site has been selected, through the Poort to the Breede River, which is crossed with six spans of 100 feet each, close below the junction of the Breede and Zonder End Rivers.

From this point the line continues on the north bank of the Breede River, crossing the Leeuw and Klip Rivers, to Swellendam, the station site for which has been placed immediately below the town on the south side of the Klip River.
Swellendam to Riversdale.

From Swellendam, the line immediately mounts the hill on a grade of 1 in 40 eastwards, about half a mile from the post road throughout, then descends until reaching the valley of the Buffelsjagt River, where it crosses successively the post road, the Applebosch, and Buffelsjagt River.

The site selected for the bridge over the Buffelsjagt River, where four spans of 100 feet each are required, is about half a mile north of the toll-house at the present bridge; thence the line is direct to the confluence of the Rietkuils and Buffelsjagt River, where it crosses the former, just before reaching the village of Zuurbraak.

At Zuurbraak, the ground best suited for Railway purposes is occupied by the post road and the village, and the line has consequently followed its southern border, escarping the cliffs on the south side of the road.

A station to serve Zuurbraak has been placed at the nearest suitable ground, viz., Tradouw.

After following the post road for some distance, the line commences to contour up Moodie’s Heights, on a tortuous grade of 1 in 40, in a south-easterly direction to the summit, and contours down on a 1 in 40 grade into the valley of the Doorn River, which is followed on its northern bank to Heidelberg.

The only available station site at Heidelberg is occupied by a portion of the township, near the Market Square and Post Office. Plans and sections of the proposed works have been submitted to the Municipality, and received their sanction.

Immediately after leaving Heidelberg, the Duivenhok’s River is crossed on four spans of 100 feet each, and the line crosses the ridge to the Krombeks River Valley, which it follows to the foot of the Vette River heights.

After contouring up these heights, on a long grade of 1 in 40 with occasional heavy cutting, a similar descent is made into the valley of the Klein Vette River, which is followed on its right bank into Riversdale.

The Riversdale station has been placed on the Commonage close to the town.

Frech Hoek.

The mountain at French Hoek has been thoroughly surveyed, with a view to selecting a suitable tunnel site for the line from Klapmuts to Caledon.

Contour lines, some three miles long on each side of the mountain, have been surveyed and connected by accurate levels and triangulation over the mountain.

From the southern face of French Hoek Mountains, three routes have been inspected.

1. Following the River Zonder End, through the ‘Poort’ to Middelplaats, and thence via Long Kloof and Zwaart River to Caledon.
2. A direct line over Ezeljagt to Caledon.
3. A line leaving the survey from Sir Lewry’s Pass to Caledon at a point 9 miles 18 chains west of Caledon and following the Bot River towards the French Hoek Mountains.

This latter line is superior in every respect to the other two, and consequently has been surveyed in detail, and forms a part of the line from Klapmuts to Caledon.

Klapmuts to Caledon (via French Hoek)
The line leaving the main line 30 chains east of French Hoek level crossing, crosses the main road half a mile further on; at 1½ miles it passes to the right of Mr. Basson’s homestead and west of the road, from which point it runs close to the road, passing to the right of Simondium Church, crossing the Dwars River about 100 yards above the road, crossing the road at 8 miles and re-crossing it at 8½ miles.

At about 10 miles, it runs to the right of the Berg River, which it crosses at 13 miles on Mr. Schalkwyk’s farm, and crosses the main road again at about 14 miles.

At 16½ miles, the nearest point to French Hoek village, which it leaves about a quarter of a mile to the right, it contours on a 1 in 40 grade and passes to the left of Messrs. Marais, Lather and Kriel’s homesteads, and enters the tunnel on the farm Scherpenheuvel. This tunnel is 3,159 yards long, and owing to the large amount of water issuing from both sides of the mountain the gradient has been laid so as to drain this off, and admit of work being carried on at each end simultaneously.

Emerging on the southern face of the mountain, the line contours, in a westerly direction, on a grade of one in 40 down the face of the mountain, to the valley of the River Zonder End, at the mouth of Bushman’s Kloof.

After leaving Bushman’s Kloof and crossing a low watershed, dividing two tributaries of the River Zonder End, the line runs to the main stream, which it crosses, and then ascends to the watershed between the River Zonder End and one of the upper sources of the Bot River; thence it follows down the valley of the Bot River, which it crosses twice.

Leaving the valley of the Bot River on the farm Phesante Kraal, the line contours up tributary kloofs, and crossing the watershed between the Bot River and Zwaart River, above the farm Lange Hoogte, contours down to the junction with the Sir Lowry’s Pass Caledon Survey, on the farm Boontjes Kraal, about 9 miles 18 chains west of Caledon.
### TUNNELS.

<table>
<thead>
<tr>
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<th>Miles</th>
<th>Chs</th>
<th>Lks</th>
<th>Yards</th>
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<tr>
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<td>...</td>
<td>...</td>
<td>...</td>
<td>203</td>
</tr>
<tr>
<td>French Hoek</td>
<td>...</td>
<td>...</td>
<td>...</td>
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### PRINCIPAL BRIDGES.

#### Sir Lowry’s Pass to Riversdale.

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<th>Span feet</th>
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</tr>
<tr>
<td>Do.do.</td>
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<td>40</td>
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</tr>
<tr>
<td>Jackalls River</td>
<td>64</td>
<td>30</td>
<td>..</td>
</tr>
<tr>
<td>Do.do</td>
<td>64</td>
<td>60</td>
<td>..</td>
</tr>
<tr>
<td>Bot River</td>
<td>69</td>
<td>10</td>
<td>..</td>
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<tr>
<td>Zwaart River</td>
<td>81</td>
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#### Caledon to Swellendam.

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<th>Lks</th>
<th>Span feet</th>
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<tr>
<td>Blood River</td>
<td>133</td>
<td>64</td>
<td>..</td>
<td>2</td>
</tr>
<tr>
<td>Kloof..</td>
<td>135</td>
<td>45</td>
<td>..</td>
<td>1</td>
</tr>
<tr>
<td>Do.</td>
<td>138</td>
<td>1</td>
<td>..</td>
<td>1</td>
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<tr>
<td>Krash River</td>
<td>142</td>
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<td>..</td>
<td>1</td>
</tr>
<tr>
<td>Kloof</td>
<td>144</td>
<td>64</td>
<td>..</td>
<td>1</td>
</tr>
<tr>
<td>Do.</td>
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<td>74</td>
<td>..</td>
<td>1</td>
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<tr>
<td>Do.</td>
<td>145</td>
<td>4</td>
<td>..</td>
<td>1</td>
</tr>
<tr>
<td>Do.</td>
<td>146</td>
<td>67</td>
<td>..</td>
<td>1</td>
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#### Swellendam to Riversdale.

<table>
<thead>
<tr>
<th>Description</th>
<th>Miles</th>
<th>Chs</th>
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<th>Span feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hesquinas River</td>
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<td>..</td>
<td>1</td>
</tr>
<tr>
<td>Frederick Botha’s River</td>
<td>150</td>
<td>52</td>
<td>..</td>
<td>1</td>
</tr>
<tr>
<td>Breede River</td>
<td>151</td>
<td>55</td>
<td>..</td>
<td>6</td>
</tr>
<tr>
<td>Leeuw River</td>
<td>153</td>
<td>67</td>
<td>..</td>
<td>1</td>
</tr>
<tr>
<td>Kloof K Kloof</td>
<td>156</td>
<td>64</td>
<td>..</td>
<td>5</td>
</tr>
<tr>
<td>Klip River</td>
<td>162</td>
<td>25</td>
<td>..</td>
<td>3</td>
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<table>
<thead>
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<th>Miles</th>
<th>Chs</th>
<th>Lks</th>
<th>Span feet</th>
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</thead>
<tbody>
<tr>
<td>Appelbosch River</td>
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<td>58</td>
<td>..</td>
<td>1</td>
</tr>
<tr>
<td>Buffelsjagt River</td>
<td>171</td>
<td>25</td>
<td>..</td>
<td>4</td>
</tr>
<tr>
<td>Reitkuils River</td>
<td>177</td>
<td>74</td>
<td>..</td>
<td>1</td>
</tr>
<tr>
<td>Doorn River</td>
<td>199</td>
<td>42</td>
<td>..</td>
<td>2</td>
</tr>
<tr>
<td>Duivenhok’s River</td>
<td>202</td>
<td>23</td>
<td>..</td>
<td>1</td>
</tr>
<tr>
<td>Krombek’s River</td>
<td>204</td>
<td>36</td>
<td>..</td>
<td>1</td>
</tr>
<tr>
<td>Doorn River</td>
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<td>49</td>
<td>..</td>
<td>1</td>
</tr>
<tr>
<td>Duivenhok’s River</td>
<td>207</td>
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<td>..</td>
<td>4</td>
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<td>Krombek’s River</td>
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<td>35</td>
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<td>2</td>
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<tr>
<td>Doorn River</td>
<td>212</td>
<td>12</td>
<td>..</td>
<td>2</td>
</tr>
<tr>
<td>Duivenhok’s River</td>
<td>222</td>
<td>2</td>
<td>..</td>
<td>1</td>
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</table>
STATIONS AND SIDINGS.
Owing to the extremely undulating character of the country, great difficulty has been experienced in selecting suitable sites for stations. The following with the mileage from Cape Town have been estimated for:

<table>
<thead>
<tr>
<th>NAME</th>
<th>Distance from Cape Town</th>
</tr>
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<tbody>
<tr>
<td>Palmiet River</td>
<td>52</td>
</tr>
<tr>
<td>Houw Hoek</td>
<td>62</td>
</tr>
<tr>
<td>Caledon</td>
<td>88</td>
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Sir Lowry’s Pass to Caledon.

<table>
<thead>
<tr>
<th>NAME</th>
<th>Distance from Cape Town</th>
</tr>
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<tbody>
<tr>
<td>Droogas River</td>
<td>108</td>
</tr>
<tr>
<td>River Zonder End</td>
<td>119</td>
</tr>
<tr>
<td>Appels Kraal</td>
<td>130</td>
</tr>
<tr>
<td>Stormsvlei</td>
<td>139</td>
</tr>
<tr>
<td>Leeuw River (Siding)</td>
<td>153</td>
</tr>
<tr>
<td>Swellendam</td>
<td>164</td>
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Caledon to Swellendam.

<table>
<thead>
<tr>
<th>NAME</th>
<th>Distance from Cape Town</th>
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<tbody>
<tr>
<td>Buffelsgat River</td>
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<tr>
<td>Zuurbraak (Tradouw)</td>
<td>183</td>
</tr>
<tr>
<td>Heidelberg</td>
<td>206</td>
</tr>
<tr>
<td>Krombek River</td>
<td>212</td>
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<tr>
<td>Riversdale</td>
<td>229</td>
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Swellendam to Riversdale.

<table>
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<tr>
<td>Dwars River</td>
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</tr>
<tr>
<td>Berg River</td>
<td>43</td>
</tr>
<tr>
<td>French Hoek</td>
<td>46</td>
</tr>
<tr>
<td>River Zonder End</td>
<td>60</td>
</tr>
<tr>
<td>Bot River</td>
<td>71</td>
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Klapmuts to Caledon.

<table>
<thead>
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<th>NAME</th>
<th>Distance from Cape Town</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
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</table>

LIST OF CURVES.

Sir Lowry’s Pass to Caledon.

<table>
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<tr>
<th>No. of Curves</th>
<th>Rad. Chs.</th>
<th>Ms.</th>
<th>Chs.</th>
<th>Lks.</th>
<th>Per cent. of Total Length</th>
</tr>
</thead>
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<td>71</td>
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<tr>
<td>81</td>
<td>Over 10</td>
<td>6</td>
<td>72</td>
<td>65</td>
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<td>..</td>
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LIST OF GRADIENTS.
Sir Lowry’s Pass to Caledon.

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<th>Gradients.</th>
<th>Rising towards Caledon.</th>
<th>1/40</th>
<th>to 1/50</th>
<th>to 1/60</th>
<th>to 1/80</th>
<th>1/80 on.</th>
<th>Level.</th>
<th>1/40</th>
<th>to 1/50</th>
<th>to 1/60</th>
<th>to 1/80</th>
<th>1/80 on.</th>
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<tbody>
<tr>
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<td>30</td>
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<td>48</td>
<td>80</td>
<td>1</td>
<td>3</td>
<td>76</td>
</tr>
<tr>
<td>% of Total</td>
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<td>7.22</td>
<td>3.03</td>
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<td>6.10</td>
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<td>1.05</td>
<td>1.90</td>
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### LIST OF CURVES.

**Caldeon to Swellendam.**

<table>
<thead>
<tr>
<th>No.of Curves</th>
<th>Rad. in Chains</th>
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<th>Lks.</th>
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<tr>
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<tr>
<td>Straight.</td>
<td>41</td>
<td>19</td>
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<td></td>
<td>53.69</td>
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</table>
LIST OF GARDIENTS.

Caldeon to Swellendam.

<table>
<thead>
<tr>
<th>Gardients</th>
<th>Rising towards Swellendam.</th>
<th>Level</th>
<th>Falling towards Swellendam.</th>
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<td>1/40 m. c. l. to 1/50 m. c. l. to 1/60 m. c. l. to 1/80 m. c. l.</td>
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<tr>
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<td>l.</td>
<td>l.</td>
</tr>
<tr>
<td>Total</td>
<td>4 69 85 m. c. l. 1 78 4 m. c. l. 1 68 75 m. c. l. 9 42 0 m. c. l. 22 66 56 m. c. l. 6 9 35 m. c. l. 2 44 25 m. c. l. 1 6 60 m. c. l. 5 1 50 m. c. l. 15 65 15 m. c. l. 76 65 80 m. c. l.</td>
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<td>6.34 2.57 2.40 6.75 12.40 29.73 7.96 3.32 1.41 6.53 20.59 100.00</td>
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# LIST OF CURVES.

*Swellendam to Riversdale.*

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<tr>
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<th>Length.</th>
<th>Per cent. of Total Lengths</th>
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<td>Ms. 2</td>
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<tr>
<td>24</td>
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<td>Ms. 2</td>
<td>Lks. 79</td>
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<tr>
<td>15</td>
<td>7</td>
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<tr>
<td>42</td>
<td>8</td>
<td>Ms. 4</td>
<td>Lks. 12</td>
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<tr>
<td>46</td>
<td>10</td>
<td>Ms. 4</td>
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<tr>
<td>109</td>
<td>Over 10</td>
<td>Ms. 15</td>
<td>Lks. 1</td>
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<tr>
<td>..</td>
<td>Straight</td>
<td>Ms. 33</td>
<td>Lks. 32</td>
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</table>
### LIST OF GRADIENTS.

**Swellendam to Riversdale.**

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1/40 m. c. l.</td>
<td>to 1/50 m. c. l.</td>
<td>1/80 on. m. c. l.</td>
<td>to 1/50 m. c. l.</td>
</tr>
<tr>
<td>1/40 m. c. l.</td>
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<td>1/80 on. m. c. l.</td>
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<tr>
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<td>1/80 on. m. c. l.</td>
<td></td>
<td>1/80 on. m. c. l.</td>
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</table>

<table>
<thead>
<tr>
<th>m. c. l.</th>
<th>m. c. l.</th>
<th>m. c. l.</th>
<th>m. c. l.</th>
<th>m. c. l.</th>
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<th>m. c. l.</th>
<th>m. c. l.</th>
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<tbody>
<tr>
<td>5 71</td>
<td>3 60</td>
<td>1 14</td>
<td>3 42</td>
<td>80</td>
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<td>1.82</td>
<td>5.50</td>
<td>17.83</td>
<td>18.78</td>
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</table>

% of Total length
LIST OF FARMS THROUGH WHICH THE LINE PASSES. Owing to the sub-division and re-naming of farms, the following farms have been taken from the Surveyor-General’s Census Map:–

**Sir Lowry’s Pass to Caledon.**

**Caledon to Swellendam.**
Veltereden, Roode Bloem’s Kraal, Spielman’s River, Zandfontein, Driefontein, Grauw Heuvel, Droogas River, Schuitzberg, Bloem’s Kraal,

**Swellendam to Riversdale.**
Swellendam Commonage, Outspan, Sparre Bosch, Oudepost, Zuurbraak,
Melkhoute Boom, Coester’s Vallei, Tradouw, Slange Rivier, Doorn Rivier,
Uitspan Kraal, Heidelberg Commonage, Doorn Boom, Duivenhok’s Rivier,
Karnemel Rivier, Melkhoute Kraal, Kragga Kraal, Vette Rivier, Aan de Vette Rivier, Zeekoe Gat, Doornkraal, Riversdale Commonage.

The survey was commenced in May, 1896, and the filed work completed in February, 1897. The progress of this work has been considerably hampered during the winter months by fog and wind. The whole length of the line has been carefully contoured, with a view to laying out the most economical centre line.

The Locomotive and Traffic Departments have been consulted as their respective requirements.
### Estimate.

<table>
<thead>
<tr>
<th>Description</th>
<th>Length</th>
<th>Total</th>
<th>Cost per Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Miles</td>
<td>Chs.</td>
<td>Lks.</td>
</tr>
<tr>
<td>1. Sir Lowry’s Pass to Caledon</td>
<td>52</td>
<td>66</td>
<td>65</td>
</tr>
<tr>
<td>2. Klapmuts Junction to Caledon</td>
<td>58</td>
<td>20</td>
<td>90</td>
</tr>
<tr>
<td>3. Caledon to Swellendam</td>
<td>76</td>
<td>65</td>
<td>80</td>
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<tr>
<td>4. Swellendam to Riversdale</td>
<td>64</td>
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<td>50</td>
</tr>
<tr>
<td>5. Sir Lowry’s Pass to Riversdale</td>
<td>193</td>
<td>76</td>
<td>95</td>
</tr>
<tr>
<td>6. Klapmuts Junction to Riversdale</td>
<td>199</td>
<td>31</td>
<td>20</td>
</tr>
</tbody>
</table>

N.B. – Cost of Rolling Stock and Locomotive requirements has been distributed over the whole length from Sir Lowry’s Pass to Riversdale, and in the event of a portion only being constructed, will require re-adjustment.

I have been honour to be,

Sir,

Your obedient Servant,

(Sgd.) G.S. Owen,

Engineer in Charge of Surveys.

The Engineer-in-Chief,

Cape Town.

Railway Construction,

Zoutpansberg District,

1909.

Presented to both Houses of Parliament by Command of His Excellency the Governor.

PRETORIA:
[...]
The Chairman of the Railway Board.

27th May, 1909.

RAILWAY CONSTRUCTION – ZOUTPANSBERG DISTRICT.

With reference to my report and recommendation dated 25th February, 1909, (Annexure 'A'), and to the decision of the Railway Board as recorded in Minute No. 4752 of the 20th March (Annexure 'B'), I transmit herewith copy of the report of the Chief Engineer dated 5th April, 1909 [...]. (Annexure 'C'.)

The question upon which the decision of the Transvaal Government and of the Transvaal Parliament will require to be taken, after considering the advice of the Railway Board, divides itself into three sections, viz.:

(1) Railway extension in the high veld of the Zoutpansberg District.
(2) Railway construction for the development of the low veld area of the Zoutpansberg District, including the Leydsdorp and Murchison Range Districts.
(3) The advisability of
   (a) assisting the most cultivated area at present of the low veld, i.e. as far as Tzaneen, and at the same time bring railway communication fairly accessible to Leydsdorp from the high veld to begin with in preference to completing and extending the Selati Line.¹
   (b) Alternatively, complete and work the partly-constructed portion of the Selati Line and extend it so as to more adequately serve the whole of the low veld than (a) probably would.
   (c) Construct the light narrow gauge line suggested in alternative (a) and at the same time complete (at a cost not exceeding £35,000) the Selati Line to its present terminus and extend the latter of such gauge, in such direction, and for such distance as the growth already and the reasonably certain prospective further growth of the trade warrant. This may be taken from present information to involve the extension of the Selati Line from its present terminus to the Great Letaba River, and if possible to Tzaneen, via Leydsdorp, an estimated distance of 150 miles to Great Letaba, and 168 miles to Tzaneen. The line should by preference, if economically practicable, traverse as near as may be the foot of the Murchison Range to Leydsdorp.
   (d) Confine operations to completing and working the Selati Line to its present terminus at an estimated cost of £35,000.
Section 1.

Railway Extension in the High Veld of the Zoutpansberg District.
The urgent need for further considerable railway extension in the high veld of the Zoutpansberg District does not seem open to doubt. What requires to be settled is the length of the extension that should be authorised at once and the direction in which it should proceed.  

(a) If the sole purpose of the extension is to serve the Messina Copper Mine\textsuperscript{2} as economically as possible, coupled with reaching Rhodesia in the shortest distance, then the line should either take the most direct route from Pietersburg, via Blaauwberg Gap, or else to Bandolier Kop, and be continued thence in a north-westerly direction. The direct line, via Blaauwberg Gap, will not, I apprehend, be considered, having regard to the nature of the country it will traverse. The direct line to Bandolier Kop would cost substantially less to construct, would be about 13 miles shorter to Bandolier Kop than the alternative line via Spelonken, which will be referred to later, and, what is of not less importance, would probably have grades about 10 per cent. to 15 per cent. more favourable if the recommendation I make later is adopted. But such a line would (next to the Blaauwberg Gap route) pass through the least fertile and cultivable part of the district, and would be of comparatively little service for local development purposes.  

(b) The alternative route shown in red on the blue print which accompanies this report, on the other hand, has been diverted as far east as the hilly nature of the country permits so as to pass through the Spelonken District, thereby travelling through a fertile area almost the whole way in order to be of service to farmers along the route as well as to farmers still further east thereof. I am informed there are also considerable copper deposits and possibly other minerals awaiting development which such a line would serve. As against this the line would, as already stated, be longer, more costly, and probably have less favourable grades than the alternative and more direct route. For each of these reasons it might seem at first preferable to adopt the first alternative, but it has to be remembered  

(1) that Rhodesia is already served by a railway from Beira and another from Capetown, Port Elizabeth, and East London. It is true that if there is any special reason therefor, a shorter line via Pietersburg could be built from Lourenco Marques than either existing route to Bulawayo, and that such a line could quite successfully compete with both. But there is no particular reason why we should seek at much cost to ourselves to deprive those lines of such trade as they have, even as things are now, and there will be still less reason under Union, when the ownership of the railways will be joint;  

(2) that a railway from any port to Rhodesia or to the Limpopo, near which the Messina and adjacent copper mines are situated, must be hundreds of miles
in length, and an addition of 12 to 15 miles in distance is therefore not really vital. A substantially less favourable grade is a more serious matter, and this will need to be fully weighed when deciding upon the expenditure to be incurred in constructing the line if the Spelonken route is decided upon;

(3) the area between the Limpopo River and the northern side of the Zoutpansberg Range is known to be extensively mineralised, especially of copper ore deposits. But while large bodies of copper ore have been located at the Messina, the whole area has been by no means fully prospected. Indeed a large portion of the district has not even been surveyed, and is Government ground.

In these circumstances it does not seem to be by any means established that a line trending from Bandolier Kop in a north-westerly direction to the Limpopo River would best serve the bulk of the mineral belt or belts known to exist north of the Zoutpansberg Range.

(4) The main ground for urging expenditure on railway extension is to assist in developing the resources of the district.

The Chief Engineer in his report indicates that at or near Bandolier Kop, about 55 miles beyond Pietersburg, will be a common and first objective whichever of the two routes is adopted. This confirms the impression we formed during the recent tour of inspection.

Mr. Wall recommends authority being taken at once for an extension from Bandolier Kop, first in a northerly direction to within about 6 miles of Louis Trichardt, and then easterly to Pisang Kop – a distance in all of about 40 miles, and at an estimated cost of £160,000. His reasons for doing so are:

(a) Pisang Kop is the meeting place for several roads leading north-east and south-east, all of which are trade routes largely used by natives from and to Portuguese Territory, Rhodesia, and the low veld. The large native population of the districts going to and returning from Johannesburg and other labour centres in the Transvaal as well as trade of other descriptions, and considerable in extent, traverses these routes. Mr. Wall thinks, quite reasonably, that a terminus at Pisang Kop would tap as well as materially increase this trade better than a terminus at Bandolier Kop would.

(b) Pisang Kop will most probably form the junction with the line to the north from Komatipoort when it is built.

(c) With the line at Pisang Kop it would be of more value for the gold mines at Birthday and Louis Moore, as well as the copper mines, when worked, that can be served by way of the N’Jelele Valley. The distance from the suggested terminus at Pisang Kop to the Birthday Mine will be about 52 miles, and to Louis Moore 42 miles, both over, I am informed, easy country.

(d) The line would be available for more rapid extension up the N’Jelele Valley when the time for doing so has arrived, and the funds for the purpose are available. /
There is much force in what is pointed out, but I regard it as only prudent at the present stage to decide definitely on the extension as far as Bandolier Kop only. To do more than this would in a measure amount to anticipating the result of the further investigations that are necessary north of the Zoutpansberg Range, as well as serve to place the Messina mines at a disadvantage.

I therefore recommend

(1) that the line from Pietersburg be extended to Bandolier Kop via Spelonken, of an estimated length of 64 miles, at a cost not exceeding £250,000. This mileage is less than that shown in the Chief Engineer’s report because it is proposed to construct the line to a 1 in 50 instead of a 1 in 80 gradient;

(2) the rails and other permanent way material available from relaying main line to be utilised for constructing the extension;

(3) that the Messina Copper Company be informed of this decision, together with the intimation that if the company desires to undertake any extension from Bandolier Kop to its mines, either of the standard gauge or of 2 ft. gauge, or from Leydsdorp to the Messina, the Administration will be prepared to take the same into consideration on the understanding that no guarantee can be given in regard to interest on capital expenditure, and that while the Administration reserves the right to take over and work any railway permitted to be built, on equitable terms, it does not guarantee to take over such line at any time;

(4) such further investigations to be made of the agricultural and mineral resources of the area between the Zoutpansberg Range and the Limpopo River as will enable a decision to be taken as to the extent, character, and route of the railway extension to and within that area which would be warranted, as well as the probable time when such railway construction should be undertaken.

Section 2.

Railway Construction for the development of the low veld area of the Zoutpansberg District, including Leydsdorp and Murchison Range Districts.

The urgent need for railway communication in the low veld of the Zoutpansberg District, including the Leydsdorp and Murchison Range Districts, has been recognised for many years, and the diminished revenue from claim licences and other sources derived by the Government of late, as compared with what was formerly received, is without doubt due to the languishing hopes of such communication being provided.

Whatever may be the prospects of any railway or railways built in the districts being themselves remunerative or otherwise from the outset, that it or they would permanently increase the occupation, enhance the value of the district, and largely increase the revenue derivable by the Transvaal Government therefrom both immediately and permanently, is not open to doubt. Copies of
the latest report of the Government Mining Engineer, dated 11th March, 1909 (Annexure ‘D’), a letter dated 22nd January, 1909, from the Zoutpansberg Cotton Syndicate of Manchester (Annexure ‘F’), and extract from a letter dated 18th May, 1909, from the Transvaal Director of Agriculture (Annexure ‘E’) are attached hereto as bearing on the subject.

But while railway communication has for long been regarded as vital to the needs of the district, a perusal of the reports and correspondence, and an examination of the plans attached thereto in connection with the sanctioning and construction of the Selati Railway, and the representations made from time to time by the Pietersburg community through their Chamber indicates that there has been considerable diversity of view as to the direction railway communication should take.

I have not had an opportunity of going through the districts, and can therefore only form an opinion as yet from the several reports I have received from engineers and other documents available for perusal.

On one question, however, there can be no doubt, and that is the partially completed Selati Line from the junction with the main line at Komatipoort to Newington, about 22 miles north of the Sabi River (a length of about 74 miles in all) should either be removed altogether or sufficiently completed to enable it to be used.

To put the line in running order to its present terminus at Newington will cost £35,000. The intention was to abandon the railway altogether, and to use the greater part of the material elsewhere – unless it could be shown, after further / enquiry, that advantageous use could be made of the line as far as it was laid – and the reasons why abandonment is undesirable and the urgent necessity for the line being put into working order and extended to the areas where it will be of great use are set out in the Government Mining Engineer’s report (Annexure ‘D’) and in the extract from the letter of the Director of Agriculture, Transvaal (Annexure ‘E’). The disadvantages of the railway to its present terminus are given in the Chief Railway Engineer’s report. (Annexure ‘C’.)

The existing partially constructed Selati Line has cost the Transvaal Government £1,283,814, and the money has been paid. The line is not worth this to the Central South African Railways Administration, but in the light of our later information I consider it is worth to us as it stands £300,000 subject to the condition that any money paid for its purchase is devoted to placing it in running order, and its extension to Tzaneen by a route that will be reasonably near to Leydsdorp.

I therefore recommend

(1) that the Transvaal Government be offered by the Central South African Railway Administration £300,000 for its Selati Line assets on condition
(2) that the money is devoted exclusively to placing the existing line in running order to its present terminus and extending it via Leydsdorp to the Great Letaba River – an estimated distance of 150 miles, and if possible to or near Tzaneen, an estimated distance of 168 miles, the route, cost, and character of the line to be left to the discretion of the Railway Board, who will, however, consult in regard to details such of its officers as the Transvaal Government may appoint;

(3) the Transvaal Government to have no further independent claim to the Selati Line or to the £300,000;

(4) the £300,000 to be provided out of the surplus net railway revenue realised during the financial year ending 30th June, 1909. The surplus net revenue that will accrue from the results of the working during the financial year ending 30th June, 1909, will be considerable and is due

(a) to the railway trade recovery during the year;

(b) to the economies in working as the result of reorganisation to which I have referred in detail in my annual report for the year 1908;

(5) the Transvaal Government to be asked to provide from the 1907 Guaranteed Loan or other source a further amount of £250,000, and if possible £300,000 to complete the extension to the Great Letaba River or Tzaneen, as indicated in this report.

I do not therefore recommend the construction of a light 2 ft. gauge line from a junction with the Pietersburg-Bandolier Kop extension to Tzaneen at a cost of £145,000, as suggested by the Chief Engineer, being undertaken at present.

Section 3.

This section has been covered by what has been brought out in dealing with the two previous sections, and repetition is unnecessary.

The Zoutpansberg Cotton Syndicate’s letter shows the urgent need and the importance to the Transvaal of being in a position to successfully grow and export its cotton. Such a line would afford the means of doing so. If it can be shown that the building of this line is the quickest and cheapest means of providing such communication, then that is a strong argument in its favour.

It has to be remembered, however, that the Transvaal cotton, while possessing the superiority indicated, will have to compete with cotton grown in all parts of the world. In practically every instance the cotton competed with grows nearer Manchester, and in many, if not most, cases also the cotton grows nearer the sea coast than ours does. To send Tzaneen cotton for export via Pietersburg means expensive land transport for hundreds of miles more than would be involved by a comparatively direct line to Komatipoort. While therefore transport via Pietersburg could be put up with for a time, it is not reasonable to expect it would be submitted to for long.

Summary of Recommendations made in this Report.
I therefore recommend

(1) that the line from Pietersburg be extended to Bandolier Kop, via Spelonken, of an estimated cost length of 64 miles, at a cost not exceeding £250,000. This mileage is less than that shown in the Chief Engineer’s report because it is intended to construct the line to a 1 in 50, instead of a 1 in 80, gradient;

(2) the rails and other permanent way material available from relaying main line to be utilized for constructing the extension;

(3) that the Messina Copper Company be informed of the decision in recommendation No. 1, if adopted, together with the intimation that if the company desires to undertake any extension from Bandolier Kop or from Leydsdorp to its mines, either of the standard gauge or of 2 ft. gauge, the Administration will be prepared to take the same into consideration on the understanding that no guarantee can be given in regard to interest on capital expenditure, and that while the Administration reserves the right to take over on equitable terms and work any railway permitted to be built, it does not guarantee to take over such line at any time;

(4) such further investigation to be made of the agricultural and mineral resources of the area between the Zoutpansberg Range and the Limpopo River as will enable a decision to be taken as to the extent, character, and route of railway extension to and within that area which would be warranted, as well as the probable time when such railway construction should be undertaken;

(5) that the Transvaal Government be offered by the Central South African Railways Administration £300,000 for its Selati Line assets on the conditions set out in paragraphs 2, 3, and 4 on page 6 of this report;

(6) that the Transvaal Government be asked to provide from the 1907 Guaranteed Loan or other source a further amount of £250,000, or if possible, £300,000 to complete the extension to the Great Letaba or Tzaneen, as indicated in this report.

T. R. PRICE,
General Manager.

Annexure ‘A.’

25th February, 1909.

Memorandum by General Manager for Railway Board.

RAILWAY EXTENSION – ZOUTPANSBERG DISTRICT.

A recent tour of inspection of the district from Pietersburg via Bandolier Kop, Fort Edward, and Louis Trichardt across the Zoutpansberg Range to about 12 miles north of Louis Trichardt, and the development observed, as well as the
reliable information afforded, made it clear that railway extension is not only warranted, but urgently needed.

The consensus of testimony was to the effect that:–

1. Taking the present main road from Pietersburg to Louis Trichardt as a rough dividing line, the country to the west thereof was much less fertile, less occupied, and less developed than the country to the east of the road.

2. The very large native population available for service on the Witwatersrand mines and for other labour purposes live east and north-east of Bandolier Kop – not only to the Transvaal border, but beyond to Portuguese East Africa and to Rhodesia. These natives rank as among the very best class of workers on the gold mines; their route of travel is via Fort Edward and Bandolier Kop to Pietersburg and thence by rail. With the extension of the railway they would join the trains at or about Bandolier Kop, and it is stated with confidence that the extension of the railway to or near Bandolier Kop will result in a substantial increase in the labour supply from the district to the mines and for other industrial and agricultural purposes.

3. The mineral wealth of the district is also east of the road both north and south of the Zoutpansberg Range so far as at present ascertained. The Messina Copper Mine seems to be approximately the eastern limit of the mineral area of the district, with the exception of the large salt pan in the vicinity of the Blauberg. The copper concentrates received at Pietersburg from the Messina mines for despatch oversea amounted during the six months ended 31st December, 1908, to 659 tons, or an average of 110 tons per month.

It should be stated that the district north and south of the range does not seem to have been by any means thoroughly prospected or examined to ascertain the mineral resources thereof./

4. The eastern district consists of, roughly speaking, a high-level and low-level plateau, the descent from one to the other being so precipitous as to render railway communication between the two well-nigh impossible, except at an initial expenditure and a subsequent cost in working that the circumstances do not warrant. It seems clear that if this low-level plateau requires to be served by railway communication, such communication should be afforded by way of the Selati Line. I have not been over this area yet, and cannot offer any recommendation based on personal observation and enquiry as to what should be done. I hope to visit the district about August next.

5. With regard to the high-level plateau, the desire of the district is for a railway almost due north from Pietersburg to the Limpopo, at or near Messina via Bandolier Kop and a little east of Louis Trichardt, and a second line from Pietersburg running about east-north-east to near the boundary of the plateau.

In regard to these proposals I have to report:–
(a) The circumstances do not appear to warrant the construction of both lines.

(b) That while an extension north as far as Bandolier Kop, which is about 52 miles by direct road beyond Pietersburg, is urgently called for, it does not seem advisable to proceed much beyond this until the mineral, agricultural, and other resources beyond are so much more clearly ascertained as to make it certain which will be the best route for the extension to take, having also in view that the line is likely to be built to the Limpopo River and on from there to Rhodesia.

(c) The line can with safety be taken to or near Bandolier Kop as being the direction the line will take whichever route is followed beyond that point.

(d) Two routes from Pietersburg to Bandolier Kop should be surveyed, viz.:–

(1) By the most direct route.

(2) By a route making a detour to the east so far as the contour of the country economically allows, and subject to the distance to Bandolier Kop not being exceeded by, say, ten miles, for the purpose of making the line more accessible to the eastern residents of the district, and thereby increase the usefulness of the line and the volume of trade to be carried.

I recommend that authority be given for these two surveys to be undertaken as early as practicable.

6. I further recommend that the Messina Copper Company be informed of the foregoing being the intention of the Administration, and that if the company desires to submit any proposals in regard to communication between Bandolier Kop and Messina the Railway Board will be prepared to take the same into consideration on the understanding that no guarantee can be given in regard to interest on capital expenditure, and that while the Administration reserves the right to take over any railway permitted to be built on equitable terms, it does not guarantee to take over such line at any time.

T. R. PRICE,

General Manager.

[...]

Annexure ‘B.’

[...]

Annexure ‘C.’

5th April, 1909.

Copy of letter from Chief Engineer to General Manager.

General Manager.
RAILWAY EXTENSION IN THE ZOUTPANSBERG DISTRICT.

I have the honour to submit the following report on the investigations carried out by me in the country north of Pietersburg.

I understood from the verbal instructions I received that it was required to make a careful inspection of the Zoutpansberg District bounded by the range of that name in the north, the Pietersburg-Louis Trichardt road on the west, the low country on the east, and the Woodbush Mountains on the south. The first object was to find out the difference in cost between a direct line from Pietersburg to Bandolier Kop, and an alternative bearing more to the east, both to be run at a grade as near as possible to 1 in 100 owing to the small amount and low grade of traffic likely to offer. I was further to find out the feasibility of crossing the Zoutpansberg with a railway should an extension beyond some such point as Bandolier Kop be considered advisable. Also your letter (G. 5194) of the 23rd February, 1909, and a copy of your preliminary memorandum on the subject of railways to serve the districts concerned, brought the extension of the Selati railway into the problem.

In the course of the tour I travelled over 360 miles, and interviewed every person who was likely to be interested in the question, and the conclusions I arrived at are embodied in this report [...].

Previous reports on the subject, which have from time to time been submitted to you, are those prepared by Mr. de Wildt in 1903, Mr. Fletcher in 1906, and Mr. Tower in September, 1906. In my covering letters I was naturally guided by the facts related by the reporting officers, and it is probable that you will find the opinions I now express different in many instances from those I held when writing before. This is only natural after having visited the country personally and reading the later reports of the Mines Department and others.

[...] The routes examined were (1) from Pietersburg via Buffles to Duivel’s Kloof, near Tzaneen; (2) via Bandolier Kop and Louis Trichardt, the Zoutpansberg, for a distance of 35 miles east and west, and to the north through Wylies Poort, where the new road crosses the Tweedeberg; (3) to Pisang Kop and through Bandolier Kop to Pietersburg along the main road. Beyond the berg and for a hundred miles west and north it is easy to see that the country is flat, offering no physical difficulties for a railway. While at Duivel’s Kloof I also climbed to the top of the last range bordering the flats, and got an excellent idea of the country lying to the east.

The country from Pietersburg to Buffles is very similar to that between Marabastad and Pietersburg, 1 in 50 or, at best, 1 in 60 country, and the nearest that I would care to try to the gradient laid down in my instructions would be 1 in 80, at which the calculated distance is 35 miles. Between Buffles and Bandolier Kop
the undulations are less pronounced, and I estimate the distance to be 33 miles, or a total of about 68 miles. This route would be from 13 to 15 miles longer than a line run direct from Pietersburg to Bandolier Kop, but every mile of it would be through cultivated land; and it would probably make all the difference to some hundreds of farmers in the Spelonken; it would tap a large labour supply; and, even if the proposals given below for assisting the mineral and agricultural interests of the low country are not approved, it would at least bring those interests some 30 or 35 miles nearer to railhead at Pietersburg. Woodbush village would not be more than 10 or 12 miles from the route. On the other hand, the direct route to Bandolier Kop would not only be shorter but would be much cheaper, and, if the objective is Messina or Rhodesia, worthy of consideration.

The choice lies between a short route, measuring 55 miles and costing about £238,829, or a longer development line costing £319,925, according to the details attached in Statements ‘A’ and ‘B.’ You will notice that the ‘works’ estimates for these lines are £3,851 and £4,042 per mile, but by adding loan charges, interest, and contingencies these figures are increased by nearly 15 per cent. to £4,342 and £4,705 respectively. The difference between Mr. Tower’s estimate of £2,890 and mine of £3,851 is easily explained. His gradient was 1 in 65 against 1 in 80, standard was for 6\textsuperscript{th} class engines against 8\textsuperscript{th} class, structures of wood and iron against brick or stone, one station against three, and prices for materials are now 20s. to 25s. per ton higher for my estimate.

Beyond Bandolier Kop the direction for a railway to the north depends on the feasibility of crossing the Zoutpansberg Range, assuming of course that the alternative direct route from Pietersburg to West Nicholson through the gap in the Blauuwberg Range is out of consideration. Owing to the state of the weather I was prevented from seeing all that I wanted to of the berg, but I examined three possible routes, and a fourth that was impossible. The mountain might be climbed by one of the spurs near Louis Trichardt until the headwaters of the Matamba are reached, and there is a crooked but not very difficult way down the valley. The actual distance from flats to flats would be 30 miles, and, besides a tunnel costing £53,000, the cost per mile would be £8,000. This is the most westerly route over the mountains, and its advantages are (1) that it is the shortest, (2) that the three ranges are here merged into one, thus affording continuous foothold, and (3) it would pass near some recent copper discoveries.

The second feasible route is, roughly, along the new road. A tunnel through the second range and some high viaducts would be necessary, and owing to having to fall between the ranges the length of this mountain line would probably be 35 miles. The cost would be heavier than No. 1 Route, probably £10,000 per mile and £50,000 for a tunnel.

The third route [...] runs up the valley of the Levoeboe through Pisang Hock, drops into the Jouberstroom and White Flag Valleys, and then follows
the N’Jelele to Sulphur Springs. This route takes 67 miles to advance 30 miles northward, and does not, in my opinion, concern the present proposition, but another which will be mentioned later. About 20 miles of the route would be very heavy, the Joubertstroom and White Flag Valleys being narrow and steep.

All the above routes were prospected for a 1 in 40 or, at least, a 1 in 50 line, and there remains to consider a rack railway. The lowest nek in the range lies behind Trichardt, and is 1,200 feet above the plain. At 1 in 20 this would take four miles to surmount, and another 4 miles to descend from. In 12 or 13 miles the three ranges would be crossed, and the road would be clear for a 1 in 80 line beyond. The rack railway would also require a tunnel in the Tweedeberg, costing £50,000, four rack engines, £25,000, and 11½ miles at £8,000=£92,000. Total for a rack proposition, £167,000.

Beyond the gratification of a few engineers, who would naturally enjoy carrying out the difficult work, I can find nothing to recommend in any of the four routes mentioned above, but, for reference purposes, it would be useful if I tabulated the proposals in abstract form:

<table>
<thead>
<tr>
<th>Route</th>
<th>Gradients</th>
<th>Length Miles</th>
<th>Cost £</th>
<th>Distance Bandolier to Messina Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matamba</td>
<td>1 in 80</td>
<td>63</td>
<td>563,900</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>1 in 40</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wagon Road</td>
<td>1 in 80</td>
<td>63</td>
<td>670,900</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>1 in 40</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N’Jelele</td>
<td>1 in 80</td>
<td>57</td>
<td>781,100</td>
<td>124</td>
</tr>
<tr>
<td></td>
<td>1 in 40</td>
<td>67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rack Railway</td>
<td>1 in 80</td>
<td>62</td>
<td>433,600</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>1 in 20</td>
<td>13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Zoutpansberg Range has been well occupied by white settlers for some years, and, so far as the country affected by the four routes is concerned, I heard of no mineral deposit or agricultural possibility which would turn the scale in favour of any of the routes, while the proposal given later in this report will, I think, be of greater benefit to the district and be much cheaper to carry out.
loan charges and contingencies. I do not know what the 11 miles through the poort would cost, but £88,000 should be ample if no tunnelling is required. The distance between Bandolier and Messina would therefore be 87 miles, cost of line £392,000, and gradient 1 in 80.

This railway has been constructed for 119 kilometres (74 miles), that is to say, the rails have been laid that far. In your G. 5194 of 23rd February I was asked to submit an estimate for extending the railway for such a distance as would place the terminus at a healthy spot, to complete the Sabie bridge (eight spans of 100 feet), and to put the remaining 74 miles into order for light engines. I have not been able to visit the line or the country beyond, but have obtained information from Major Hamilton, a copy of whose letters I enclose. He agrees with what Mr. Wheelwright told me that south of the Great Oliphants River the country is an uninhabited wilderness. Considering the unhealthiness of the district, the difficulty and cost of importing skilled and unskilled labour, I think it would be unwise to submit a lower estimate than the following:–

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sabie Bridge</td>
<td>£19,238</td>
</tr>
<tr>
<td>Two major bridges</td>
<td>10,000</td>
</tr>
<tr>
<td>Extension 25 miles</td>
<td>87,500</td>
</tr>
<tr>
<td>Repairing 74 miles</td>
<td>3,700</td>
</tr>
<tr>
<td>Offices, quarters, water, and other equipment at Sabie and Railhead</td>
<td>2,500</td>
</tr>
<tr>
<td>Rest rooms and native huts</td>
<td>1,000</td>
</tr>
</tbody>
</table>

£123,938 (say £125,000)

This extension would reach Farm Acornhoek No. 670, and the terminus would be 684 feet higher than where the railway now ends on Newington. Acornhoek, on Mr. De Wildt’s survey, is 91 miles from Leydsdorp; that is, from all the known mineral and agricultural wealth of this part of the district, and from an unlimited labour supply of the best kind. It is agreed that the area to be served eventually by the Selati Railway is bounded by the Great Oliphants on the south, the Zoutpansberg and Limpopo on the north, the Drakensberg on the west, and Portuguese territory on the east. The route of the original concession struck the Great Oliphants or southern boundary in the middle, and was projected to proceed in a northerly direction. Subsequent surveyors made Pietersburg their objective, and ran into extremely difficult country almost the very moment they touched the area they came all the way from Komatipoort to serve. I consider that, confined to its proper function of developing the low veld, the Selati Railway would be both a necessary and useful line to construct. Its destiny as a competitor with our own Pretoria- Pietersburg, or later, with Beira, at West Nicholson, will be accomplished when existing lines have developed the areas they serve and can afford to lose some oversea traffic. For this reason I advise that, when extended, the Selati Railway should follow the direction of
the traffic immediately offering, the gold reefs of the Murchison Range, copper at Palabora, and the large centres where the needs of natives will develop trade. Its alignment should be almost due north for 200 miles from Acornhoek, and it should then run up the valley of the Levoeboe along the southern slopes of the Zoutpansberg, passing six miles east of Trichardt, and then joining in at Bandolier Kop [...].

It will be noticed from what I have said that owing to the character of the country no extension of the Selati Railway would be of much use till it reached the Great Oliphants River, 60 miles, and that then the distance to the goldfields would still be 56 miles further. These 190 miles from Komatipoort would practically produce no local traffic, a serious matter for such a long and expensive line. Alternative schemes for affording temporary relief and collecting revenue were, therefore, investigated and are here submitted for consideration.

The first depends on the decision as to the route between Pietersburg and Bandolier Kop. On the assumption that the circular route will be adopted, there should be a station on farm Netrecht at the top of Bufflotes Range, 35 miles from Pietersburg. From this point to Leydsdorp is 78 to 80 miles. A standard gauge railway down the steep descent to the low veld would be a very expensive undertaking, but from observations I have taken I consider that a 2 feet gauge railway of the type constructed in Natal to Weenen and Stuartstown, and costing £2,750 per mile (exclusive of rolling stock), to a gradient of 1 in 33, would bring Tzaneen (40 miles) into railway communication with the world for the same money that an extension of the Selati Railway would carry the line to Acornhoek. Leydsdorp would then be 38 to 40 miles from the terminus, and the worst or hilly portion of the journey would have been accomplished. The route followed would pass for the last 20 miles through well settled farms, such as Westphalia and Tzaneen, a filip would be given to cotton growing, and the gold industry of the district would go ahead, while a considerable native population would be tapped for the Witwatersrand mines. Supposing half the claim licences paid in the district in 1903 were renewed in consequence of this light railway, the revenue accruing to Government would be more than 10 per cent, on the outlay now suggested. It may be suggested, in passing, that the similar problem in the Lydenburg District may be solved more quickly by the same means with equal or perhaps better prospects of handsome returns.

The Buffles-Tzaneen proposal would hardly suffice for the needs of the district, and there is a further factor which enables me to recommend an extension of the railway from Bandolier Kop to the slopes of Pisang Kop on the left bank of the Levoeboe.

I was informed by the Native Commissioner of the district that about 36,000 passes were issued for natives leaving the district for work during 1908. There is a chance that these natives, who may also be counted upon to return during
the year, would continue to walk to Pietersburg unless the railway were brought nearer to them. It is also necessary to push on the agricultural development of the Zoutpansberg, and for this purpose a light standard gauge railway to 1 in 50 gradient would be useful. It would really be eventually a section of the Selati Railway, and at its terminus would point to the easiest, or, indeed, the only easy way of passing from the high to the low veld. The cost of this line, if extended to 40 miles, at £3,500, plus £500 for loan and contingencies, would be £160,000.

It is near the terminus of this line, that is, at Pisang Hoek, that one of the routes across the mountains enters the range, and proceeds, via Joubertstroom, the White Flag Valley, and N’Jelele to a point on the Zand River Poort-Messina Line [...]. There is nothing to recommend this route till the Selati Railway is completed as far as Pisang Kop, when it might afford a short cut to Komatipoort.

Summarising, the routes dealt with in the above remarks comprise

<table>
<thead>
<tr>
<th>Length</th>
<th>Cost.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pietersburg-Bandolier direct</td>
<td>55 £238,829</td>
</tr>
<tr>
<td>2. Pietersburg-Buffels-Bandolier</td>
<td>68 319,925</td>
</tr>
<tr>
<td>4. Bandolier-Trichardt, via Wagon Road to Messina</td>
<td>98 670,900</td>
</tr>
<tr>
<td>5. Bandolier-Pisang Hoek-N’Jelele-Messina</td>
<td>124 781,100</td>
</tr>
<tr>
<td>6. Bandolier-Messina Rack</td>
<td>75 433,600</td>
</tr>
<tr>
<td>7. Bandolier-Zand River Poort-Messina</td>
<td>87 392,000</td>
</tr>
<tr>
<td>8. Komatipoort-Acornhoek...</td>
<td>99 125,000</td>
</tr>
<tr>
<td>9. Buffels-Tzaneen, 2ft. gauge</td>
<td>40 143,274</td>
</tr>
<tr>
<td>10. Bandolier-Pisang Kop...</td>
<td>40 160,000</td>
</tr>
</tbody>
</table>

I think it ought to be easy to make a choice from this list as to what should be taken in hand. My results are of necessity based only on the sketchiest survey, and I strongly advise that survey parties be put in the field without delay to work out more reliable estimates for submission to Parliament.[...]

B. P. WALL,  
Chief Engineer.

**Preliminary Estimate. – A.**  
*Pietersburg-Netrecht-Bandolier Kop (Full Red)*

<table>
<thead>
<tr>
<th>Length, 68 miles.</th>
<th>Gradient, 1 in 80.</th>
<th>Sidings, 2 miles.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Preliminary Expenses</td>
<td>Miles</td>
<td>68</td>
</tr>
<tr>
<td>B. Land and Expropriation</td>
<td>„</td>
<td>68</td>
</tr>
<tr>
<td>C. Earthworks ...</td>
<td>Cub.yds.</td>
<td>388,280</td>
</tr>
<tr>
<td>Forming ...</td>
<td>L.ehs.</td>
<td>1,197</td>
</tr>
<tr>
<td>Drainage ...</td>
<td>Miles</td>
<td>68</td>
</tr>
<tr>
<td>D. Minor Bridges</td>
<td>„</td>
<td>68</td>
</tr>
<tr>
<td>E. Major Bridges</td>
<td>„</td>
<td>68</td>
</tr>
<tr>
<td>Unit</td>
<td>Quantity</td>
<td>Rate</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------</td>
<td>--------</td>
</tr>
<tr>
<td>F. Fencing</td>
<td>68</td>
<td>120</td>
</tr>
<tr>
<td>G. Permanent Way and Laying</td>
<td>70</td>
<td>1,600</td>
</tr>
<tr>
<td>Points and Crossings</td>
<td>27</td>
<td>50</td>
</tr>
<tr>
<td>Ballasting</td>
<td>70</td>
<td>350</td>
</tr>
<tr>
<td>H. Water</td>
<td>2</td>
<td>1,800</td>
</tr>
<tr>
<td>K. Signals and Signs</td>
<td>68</td>
<td>20</td>
</tr>
<tr>
<td>L. Stations and Equipment</td>
<td>4</td>
<td>1,500</td>
</tr>
<tr>
<td>M. Quarters</td>
<td>68</td>
<td>150</td>
</tr>
<tr>
<td>N. Telegraphs</td>
<td>68</td>
<td>80</td>
</tr>
<tr>
<td>P. Supervision</td>
<td>68</td>
<td>220</td>
</tr>
<tr>
<td>R. Medical</td>
<td>68</td>
<td>25</td>
</tr>
</tbody>
</table>

£274,879 Per Mile. £4,042

<table>
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<th>Unit</th>
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<th>Rate</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>S. Loss on issue of Loan, 3¼ per cent. below par</td>
<td>...</td>
<td>8,933</td>
<td></td>
</tr>
<tr>
<td>Cost of raising Loan, 1½ per cent.</td>
<td>...</td>
<td>4,123</td>
<td></td>
</tr>
<tr>
<td>Interest during construction, 3 per cent. for 18 months</td>
<td>...</td>
<td>8,246</td>
<td></td>
</tr>
<tr>
<td>Contingencies, 5 per cent. on Works</td>
<td>...</td>
<td>13,744</td>
<td></td>
</tr>
</tbody>
</table>

£319,925 £4,705

PRELIMINARY ESTIMATE. – B. Pietersburg-Bandolier Kop Direct (Full Blue).

<table>
<thead>
<tr>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Preliminary Expenses</td>
<td>55</td>
<td>£30</td>
<td>£1,650</td>
</tr>
<tr>
<td>B. Land and Expropriation</td>
<td>55</td>
<td>30</td>
<td>1,650</td>
</tr>
<tr>
<td>C. Earthworks</td>
<td>Cub.yds.</td>
<td>156,750</td>
<td>2/6</td>
</tr>
<tr>
<td>Forming</td>
<td>Chains</td>
<td>1,452</td>
<td>£2</td>
</tr>
<tr>
<td>Drainage</td>
<td>Miles</td>
<td>55</td>
<td>50</td>
</tr>
<tr>
<td>D. Minor Bridges</td>
<td>&quot;</td>
<td>55</td>
<td>350</td>
</tr>
<tr>
<td>E. Major Bridges</td>
<td>&quot;</td>
<td>55</td>
<td>180</td>
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<tr>
<td>F. Fencing</td>
<td>&quot;</td>
<td>55</td>
<td>120</td>
</tr>
<tr>
<td>G. Permanent Way and Laying</td>
<td>57</td>
<td>1,600</td>
<td>91,200</td>
</tr>
<tr>
<td>Points and Crossings</td>
<td>Sets</td>
<td>21</td>
<td>50</td>
</tr>
<tr>
<td>Ballasting</td>
<td>Miles</td>
<td>57</td>
<td>350</td>
</tr>
<tr>
<td>H. Water</td>
<td>Stations</td>
<td>2</td>
<td>1,800</td>
</tr>
<tr>
<td>K. Signals and Signs</td>
<td>Miles</td>
<td>55</td>
<td>20</td>
</tr>
<tr>
<td>L. Stations and Equipment</td>
<td>Stations</td>
<td>3</td>
<td>1,500</td>
</tr>
<tr>
<td>M. Quarters</td>
<td>Miles</td>
<td>55</td>
<td>150</td>
</tr>
<tr>
<td>N. Telegraphs</td>
<td>&quot;</td>
<td>55</td>
<td>80</td>
</tr>
<tr>
<td>P. Supervision</td>
<td>&quot;</td>
<td>55</td>
<td>220</td>
</tr>
<tr>
<td>R. Medical</td>
<td>&quot;</td>
<td>55</td>
<td>25</td>
</tr>
</tbody>
</table>

£211,823 Per Mile. £3,851

<table>
<thead>
<tr>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. Loss on Issue of Loan, 3¼ per cent. below par</td>
<td>...</td>
<td>6,884</td>
<td></td>
</tr>
<tr>
<td>Cost of Raising Loan, 1½ per cent.</td>
<td>...</td>
<td>3,177</td>
<td></td>
</tr>
</tbody>
</table>
Interest during Construction, 3 per cent. for 18 months ... 6,354
Contingencies, 5 per cent. on Works ... 10,591

£238,829 £4,342

/ Sabie Bridge, 22nd March, 1909.

Dear Mr. Wall,

Thanks for your letter of the 10th instant. I would be very glad to see you any time you can come up here, and to give you all the information I can. I hardly think however that I should be able to go up in that direction next month myself.

I do not think you could possibly find a place at all healthy at a less distance than 25 miles from present railhead of the Selati in a north-western direction.

The ridge on farm Acornhoek No. 670, which is probably the highest point on the present surveyed extension might be healthy in winter, but would certainly not be so in summer. You would have to go considerably further west in my opinion to get a reasonably healthy site. Due northwards the country remains low and malarial all the way to the Drakensberg, the higher becomes the terrain, and, consequently, the healthier it is.

There is a considerable native population and a few white storekeepers on the foot-hills, whereas the low country proper due north by railhead is inhabited now by natives, south of the Oliphant.

We have had, and still have, floods from the high country, but no great amount of rain has fallen here (about 17 inches since October).

Further north toward the Oliphants River there has been hardly any rain, and streams taking their rise in the low country are lower than they were in October.

Yours truly,

J. H. HAMILTON.

Annexure ‘D.’

11th March, 1909.

Memorandum by the Government Mining Engineer on the Mineral Possibilities of the Murchison Range and neighbouring territory:

1. The area that would be served by continuing and running the Selati Railway to Leydsdorp, or alternatively by working the present line and constructing a road from Newington to Leydsdorp, extends north as far as the Klein Letaba, and takes in the country between the edge of the Drakensberg and the Portuguese border. The construction of a branch line up the berg towards the Pilgrims Rest fields is also possible, but this, though a possible contingency, will not be taken into consideration in regard to its bearing on this latter area.

2. South of the Oliphants River no mineral discoveries of any note have as yet been made below the berg, so that the area to be considered is practically that
between this river and the Klein Letaba, or a little further north, and extending from the border westwards as far as the Drakensberg, taking in the banket and other reefs in the neighbourhood of Haenertsburg.

3. Within this territory the mineral discoveries of potential value comprise deposits of gold, copper, antimony, and mica. The geological formation throughout this area is one that is well known as containing promise of the presence of many other minerals besides those mentioned, and a large part of the district is still practically unknown territory.

Gold.

4. The auriferous deposits are found respectively along the edges of the Drakensberg, in the Murchison Range, and at the Louis Moore and Birthday properties near the Klein Letaba River.

5. In the krantzes and slopes of the Drakensberg, numerous banket reefs are found to outcrop. Some of these contain gold, and have been worked to some extent, but have not hitherto been found to be payable, the gold contents being erratic and the grade low. The better known properties are in the neighbourhood of Haenertsburg, and would receive no benefit from the construction of a road from Newington to Leydsdorp. A railway to Leydsdorp would, however, cheapen transport from the coast considerably.

Some of these reefs may in places yield sufficient payable ore to support individual diggers or small syndicates. Adit working is invariably possible, and water power generally available, so that working costs should be low.

6. The Murchison Range has been the principal prospecting field in the past, and numerous syndicates and companies have at one time or another carried on operations on its reefs. There are two main lines of reefs, known respectively as / the Northern or Antimony Belt, and the Southern or Spitzkop Belt. Both of these lines extend for many miles, not as continuous reefs, but as well defined belts in which reefs of greater or less width and longitudinal extent are found.

7. The better known properties in the Murchison Range are the H.E. Proprietary, which is interested in the Blue Jacket and Free State Mines, the Gravelotte Mine, the Sutherland Reefs Company.

8. The H.E. Proprietary Company is connected with many low country ventures, and its holdings are typical of the mining propositions found in it. On both the Blue Jacket and the Free State Mines rich chutes of ore have from time to time been struck, but the average value of any considerable bodies of ore are considered too low to justify further expenditure at present. These rich chutes would, however, be large enough to keep tributors or small syndicates at work. The company reports that it has spent £60,000 in the district, and is at present employing seven diggers. It recently erected a small steam stamp mill, and won £2,700 worth of gold in a few months from the Blue Jacket Mine, but after thus
testing the property it finds the conditions of working too onerous to continue. The company now owns 357 claims as against some 3,000 formerly held by it.

9. The Gravelotte Mine of 113 claims, now owned by the Consolidated Mines Selection Company, has been opened up to a depth of 220 feet, and is very patchy as regards gold contents. The antimony reef on this property contains both stibnite and gold of very irregular values, not very promising at depth. The property as a whole offers certain inducements for working if transport and working costs could be materially reduced.

10. The Sutherland Reefs Proprietary Company owns 800 acres on the farm Potsdam, near Leydsdorp. The company claims that it has a reef of 5 feet developed, averaging 9 dwts., but the Inspector of Mines cannot confirm this. He is, however, of opinion that the property could be worked successfully on a small scale with cheaper transport.

11. Besides these propositions there are a number of other blocks and properties along the two mineralized belts of the Murchison, such as the Caledonian, Lawrence, Pioneer, Coblenz, Rainbow, etc. The formation and the reefs are very similar to those found in Rhodesia, and the advent of cheap transport is likely to induce prospecting operations being resumed, and possibly to lead to the establishment of small plants wherever payable chutes are found.

12. The Louis Moore and Birthday properties near the Klein Letaba River are owned by the same company. The latter mine has not been worked for the last fifteen years, but the Louis Moore is not erecting a new 20 stamp battery with cyanide plant, which is expected to be in running order shortly. On both these properties very large sums of money were spent in past years. The present owners bought them for a mere song and should be able to make them pay fair dividends if the capital is kept low. The mines are 120 miles by road from Pietersburg, and are situated in a very unhealthy area. The Louis Moore Mine is in a belt of mineralized schist, much shattered in places, rather resembling the ore deposits of Western Australia, and containing large bodies of low grade rock.

COPPER.

13. Copper is found at Palabora, about forty miles east of Leydsdorp. There are extensive old native workings, and the indications are promising, but the company owning the claims (the H.E. Proprietary) has not, under present transport conditions, deemed it advisable to prospect and open up the deposit.

ANTIMONY.

14. Antimony is found in the Murchison Range, along with gold, in the so-called antimony line of reefs. The best deposit is found on the Gravelotte Mine where the metal is found in abundance in the upper oxidized portion of the lode, but decreases in quantity when the pyritic zone is reached. Little attention has
hitherto been paid to the commercial aspect of this occurrence, probably owing to the low prices prevalent in former years, and to the fact that the oxide, which is principally found near the surface, escaped notice.

Mica.

15. The Godiva Syndicate is working this mineral some 30 miles south-east of Leydsdorp. The syndicate recently shipped some mica to London, but found it difficult to sell its product owing to the alleged existence of a mica ring which is said to have absolute control of the market. Mica of fair quality is known to occur at several localities in the district, but has not hitherto been successfully exploited. /

General Remarks.

16. The principal drawback to the development of the district has been the lack of cheap and quick transport for men and supplies, and this was accentuated when the outbreak of tick fever amongst cattle took place. The mineral indications are plentiful, but even claims of considerable promise have been allowed to lapse owing to the fact that money could not be found for prospecting, as the district was considered more or less out of the pale by reason of its isolation and the prohibitive cost of transport.

17. The bad climate has also militated against the opening up of the district. Railway facilities indirectly improve the climatic conditions by allowing improved methods of working, the better housing of employees, cheaper luxuries and comforts, and, above all, the feeling that a man can easily get away for a change when necessary. As regards malaria, good feeding and housing are recognised as being very large factors in warding off the disease. With such improved conditions a better class worker will be introduced instead of the unsatisfactory class of man with which the low country has hitherto had to put up. To the better class man the risk of fever may not be a very formidable barrier, but he cannot long endure the sense of isolation and lack of stimulus attaching to a district cut off from the larger centres of population.

18. The Geological Survey Department refers in the following terms to this district in its report for 1906:– ‘There is no doubt that these fields could support a fair number of independent workers or small groups of miners were it not that under present conditions transport rates are practically prohibitive ... Although the country offers so many opportunities for small ventures it is not without promise for enterprise on a more extensive scale. Ore deposits of the kind described in connection with the pyritic reef of the Free State Mine, and possibly also those of the type of the Coblenz Reef, give promise of mining operations of considerable magnitude once the difficulties of transport are overcome. The district forcibly impresses the visitor as much by its possibilities as a highly
mineralized area as by the very small amount of work which has hitherto been expended upon it, and which has been almost entirely limited to a few comparatively restricted areas."

19. In order to improve the water supply – which is rather poor along the Murchison Range – it is contemplated to put down a series of 13 boreholes at a total cost of £3,400.

20. There can be no question that the extension of the line to Leydsdorp would put new life into the various prospecting and mining ventures, and that the pulling up of the present Selati Line would, on the contrary, be the deathknell of the hopes of all parties interested in that district.

21. From returns made to this department, it appears that during 1908 10 concerns, employing 17 whites and 240 natives, produced gold of the value of £15,290. In addition there are some individual diggers who make no returns to the Government.

22. There were at one time some 45 companies interested in the district, with a nominal capital of over £4,000,000. Of these some 14, with a capital of £1,570,000, are still in existence. This large capital is accounted for by a few companies, such as the Harmony Proprietary (£1,000,000) and H. E. Proprietary (£150,000), which have large capital and holdings, but are doing little development.

23. The number of claims at present held in the Leydsdorp District is about 6,200. The number formerly held, and which would again be held if the district were opened up by a railway, would undoubtedly be much larger. In estimating revenue for railway purposes the increased amount paid to the State in claim licences should not be lost sight of, nor the probability that an influx of population will to a greater or less extent take place, and lead to the increased revenue by way of custom and transfer dues, and other indirect ways.

24. It is manifestly impossible to form an estimate of the number of stamps that would be at work or of the number of persons likely to be employed in mining and prospecting were the district linked up to the railway system. Beyond the 20 stamps now being erected by the Louis Moore, there are no signs of increasing activity, nor are any likely to be seen until conditions change.

25. The mineral resources of this area are so promising that the Government should seriously consider the advisability of giving it railway communication. The agricultural and cotton-growing possibilities of the district will no doubt be taken into account when coming to a decision in the matter. The completion of the Selati Line as far as Leydsdorp is suggested as the most direct way of connecting up with the Transvaal railway system. Without such improved means of communication the fields would continue to lie fallow for want of sufficient stimulus to mining enterprise, since such enterprise would have little hope of meeting with a sufficient reward.

R. N. KOTZE. /
Annexure ‘E.’

Extract of letter from the Director of Agriculture, Transvaal, dated 18th May, 1909.

With respect to railway communication to the eastern part of the Transvaal, I trust you will bear in mind the probability of there being a serious shortage in timber for pit props before long, and that the eastern portion of the Transvaal is by far the best part of the country for timber growing. All along the edge of the berg, from Pilgrims Rest northwards excellent timber can be grown, and I suppose we can raise timber in the neighbourhood of Tzaneen more rapidly than anywhere else in the Transvaal; it will also be possible to grow wattles in these areas.

We have about 250 acres of cotton growing at Tzaneen, which promises well, but I am inclined to think that mealies, alternated with ground nuts, will prove even more profitable for that district than cotton – always supposing railway communication can be established thereto.

Annexure ‘F’

The Zoutpansberg Cotton Syndicate, Limited,
413 Produce Exchange,
Manchester, 22nd January, 1909.

Colonel Seeley, M.P.,
The Colonial Office.

Sir,

In the summer of 1907 representations were made to spinners here that cotton as used in our Lancashire mills could be grown to mutual advantage in the Zoutpansberg District (Northern Transvaal).

The above experimental syndicate was accordingly registered [...]

No time was lost in sending out Mr. A. Niven Whyte, an expert in cotton growing, to superintend the experiment and to advise the farmers as to the proper cultivation of the plant.

Owing to delays in securing good seed from America, and to the Transvaal authorities’ very proper desire to have the seed thoroughly fumigated, the sowing only took place in January and February, whereas it should have been completed by mid November. Notwithstanding this, Mr. Whyte is completely satisfied that the Transvaal is eminently suited for cotton growing for the following reasons, viz.:

(a) The soil is good;
(b) the rainfall is plentiful;
(c) there is an entire absence of frost;
(d) the necessary heat requisite for the maturity of the bolls can be counted upon at the right season;

so that Mr. Whyte believes that the Transvaal is better adapted to cotton growing than America.

On the other hand, however, the absence of any railway communication in the district most suitable for the industry entails so heavy a charge for transporting the cotton from the ginnery to the broker’s warehouse in Liverpool that, with low prices ruling here, it might be difficult to secure a profit for growers, and for those who have to handle the product. (Indeed, at the present time tons of good fruit are allowed to rot on the land because the cost of conveying it to the nearest market town is so heavy.)

From the eagerness with which the farmers have taken up cotton growing, it is evident that they are satisfied that the industry will benefit them, and it must be remembered that they do not require any balance at their bankers to embark them upon it, so that any industrious farmer can make a profit by growing cotton once the matter of transport is settled.

As an evidence of what the transport now costs, we may inform you that we secured some 49 bales from our planting, and paid, apart from the charges of carrying the cotton to our ginnery:

- Transport on 2,000 lbs. from Pietersburg Railway Station … £2 0 0
- Railway charges on 2,000 lbs. from Pietersburg to Delagoa Bay … 1 6 4
- Freight from Delagoa Bay to Liverpool … … … £3 8 9

In view of the fact that to take the cotton the 80 miles per road costs us so much more than to carry it over 580 miles per rail is sufficient reason for believing that the extension of the railway by Selati would enable the farmers to make a profit, and thus secure the industry permanently. We shall, therefore, be glad if you will kindly use your influence with the necessary authority at Pretoria to get the Selati route extended as early as possible, a step which will not only encourage us to continue nursing the industry, but which will also benefit the many farmers whose dire poverty requires such help.

From the information given you at the interview which you were kind enough to grant to our Secretary and Mr. Whyte, you already know the terms on which we have dealt with the farmers, and that we are not by any means speculators trying to exploit inexperienced people; and further, that should the Transvaal be able to secure the continuance of the industry, not only will the benefit be felt in the Transvaal, but also very much in our own country.

Inasmuch, then, as the successful carrying on of our business tells for the prosperity of the Transvaal, as well as for the millions of Lancashire, we should be glad when you address the official at Pretoria if you would recommend that all necessary facilities be granted to us.
We are aware of the hearty support you have so kindly afforded to the British Cotton Growing Association in Nigeria and elsewhere, and as we are working in conjunction with them we trust we may receive like consideration.

I have, etc.,

FREDK. WHOWELL,
Chairman.

Printed for the use of Colonial Office.

AFRICAN (EAST).
No. 1099.
CONFIDENTIAL.

TANGANYIKA TERRITORY

PROPOSED LOAN

FOR

RAILWAY AND HARBOUR DEVELOPMENT.

COLONIAL OFFICE,
November, 1924.
NOTE. – At a meeting of the sub-committee of the Unemployment Committee, held on May 12th, 1924, the Right Hon. T. Shaw,¹ C.B.E., M.P., Minister of Labour, in the chair, it was agreed as follows:–

‘To request the Secretary of State for the Colonies, on receipt by him of full information from the Governor, and after consultation with the Treasury, to furnish them with a detailed Memorandum on the Tanganyika Development proposals, indicating the annual burden which would be imposed on the Exchequer by their adoption, and the extent to which they would relieve unemployment.’

The late Government, on the recommendation of the Committee on Unemployment, authorised the adoption of the following proposals for development expenditure in Tanganyika Territory:–

(a) Purchase of a steamer for use on Lake Tanganyika, estimated cost, 35,000/.

(b) Extension of the light railway or tramway, running from a point near the port of Lindi, for about 90 miles into the interior, estimated cost, 50,000/.

The approval of these proposals was announced by Sir Montague Barlow² in his speech on the adjournment (‘Official Report,’ August 1st, 1923, p. 1572), and he added that the financial assistance would take the form of a loan ‘free of interest, at any rate for a time.’ Sir Montague explained that proposal (b) above was strongly supported by the Empire Cotton-Growing Corporation.

The total expenditure contemplated under the two proposals was, therefore, 85,000/.

Shortly after the change of Government, Mr. Thomas decided to consider the advisability of extending the limited authority conveyed in the decision quoted above, both in the interests of unemployment relief, of the territory, and of the extension of cotton-growing, for which the territory is a very promising field. The Governor was invited to make recommendations with approximate estimates of cost.

These recommendations and estimates have now been received. They are contained in two despatches which are printed as annexes to the present Memorandum. The total expenditure involved is estimated at 1,500,000/., whereof 590,000/ represents expenditure in this country and 910,000/ local expenditure. The development schemes recommended are set forth in paragraph 2 of Annex 1, but are summarised here for convenience:–
Communications in Africa, 1880–1939: Volume 2

<table>
<thead>
<tr>
<th>Scheme Description</th>
<th>Home Expenditure</th>
<th>Local Expenditure</th>
<th>Total.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Harbour improvements at Dar-es-Salaam, the capital, and terminus of the Central Railway which crosses the country from the Indian Ocean to Lake Tanganyika.</td>
<td>£34,000</td>
<td>£59,000</td>
<td>£93,000</td>
</tr>
<tr>
<td>B. Feeder line from Tabora on Central Railway to neighbourhood of Shinyanga.</td>
<td>£306,000</td>
<td>£347,000</td>
<td>£653,000</td>
</tr>
<tr>
<td>C. Slipway, &amp;c., at Kigoma, Lake terminus of Central Railway.</td>
<td>£13,000</td>
<td>£15,000</td>
<td>£28,000</td>
</tr>
<tr>
<td>D. Electric Power station, Dar-es-Salaam</td>
<td>£7,000</td>
<td>£1,000</td>
<td>£8,000</td>
</tr>
<tr>
<td>E. Extension and reconditioning of Lindi Light Railway (Lindi is a port in the extreme south of the Territory).</td>
<td>£26,000</td>
<td>£24,000</td>
<td>£50,000</td>
</tr>
<tr>
<td>F. Feeder line from Itigi or Manyoni (on Central Railway) to Singida.</td>
<td>£170,000</td>
<td>£430,000</td>
<td>£600,000</td>
</tr>
<tr>
<td>G. Rolling stock, workshops, surveys, &amp;c.</td>
<td>£34,000</td>
<td>£34,000</td>
<td>£68,000</td>
</tr>
<tr>
<td></td>
<td>£590,000</td>
<td>£910,000</td>
<td>£1,500,000</td>
</tr>
</tbody>
</table>

It will be observed that of the two schemes referred to at the beginning of this memorandum as having been ‘authorised’ by the late Government, only (b), the Lindi Railway, appears in the list. The reason is that the Governor expressed a strong opinion that (a) the lake steamer was not urgently required; and that the money might be more profitably employed for other purposes.

Annex 1 to the present memorandum deals with the schemes generally, but as regards Scheme A (Dar-es-Salaam Harbour improvements), reference is made (in paragraph 3) to another despatch dated December 3rd, 1923. This despatch is printed as Annex 2.

The following observations are supplementary to and explanatory of the contents of the Annexes.

General.

Tanganyika Territory (formerly German East Africa) is larger than any other British Dependency without Dominion status. It was an active theatre of war up to the Armistice, and suffered very great material damage by destruction of buildings, bridges, rolling stock, harbour works, &c. There was, of course, a complete cessation of trade, and the attitude of the native inhabitants was doubtful. It was necessary to institute an administration in all its branches, repair the ravages of war, and give the natives a better government than they had under the Germans; all this at a time when neither men nor money were easily obtainable. The country is now administered by His Majesty’s Government under Mandate from the League of Nations, which among other things secures non-preferential
trade and the principle of Trusteeship for the natives. In accordance with that principle slavery has been abolished and land legislation enacted, under which large concessions or alienations to Europeans are inadmissible. The Territory lies just south of the Equator, and only a very limited area is suitable for European settlers.

The 'Loans in Aid' of the Administration from Imperial funds for the last three years have been 914,000l. (of which 164,000l. was a 'grant'). 800,000l. and 750,000l. The Loan asked for in the current year is 350,000l. These loans-in-aid are repayable with interest when the financial circumstances of the Territory permit. At present interest is only paid on the amounts provided for certain revenue-producing undertakings.

The Treasury, in approving the Estimates for the current year, expressed their satisfaction at the improvement in the financial situation. The local revenue, which was 946,844l. in 1920–21, is estimated to reach 1,324,670l. this year. The total volume of trade increased from 2,815,759l. in 1921 to 3,798,865l. in 1923, and the value of local produce exported in the same period from 1,246,870l. to 1,657,601l. It may be observed that the latter figure is higher than that of Kenya for the same year. The great need of the country is the improvement of communications. Its capacity for development is immense.

Scheme A. – Dar-es-Salaam Harbour Improvements (see Appendix 2).

It will be seen that the present scheme is a modest substitute for a much more ambitious one which had been previously put forward, but is considered sufficient to meet the requirements of the port for many years to come. The improvement of the harbour is considered by the Governor to be the most urgently necessary of the works included in the general schedule, and he originally made provision for it in his Estimates for the current year – that is to say for a first instalment in payment of the cost of works to be spread over a total period of three years. The present facilities at the port are totally inadequate and have been the subject of frequent year from the East African Steam Conference, supported by evidence from the Union-Castle Line and the British India Steam Navigation Company. The former reported a delay of eight days in discharging 1,768 tons 'owing to the inadequacy and inefficiency of the port facilities for the handling of cargo,' and stated that 'the serious disabilities now experienced by steamers visiting Dar-es-Salaam lend no encouragement to vessels to continue calling at the port.' The British India Company mentioned a case in which a steamer took 15 days to discharge 2,200 tons, and described the facilities as 'totally inadequate,' adding that 'in consequence of these delays it has been necessary to limit the quantity of cargo shipped to Dar-es-Salaam to avoid steamers missing their scheduled dates at later ports of call.'
Since the Governor’s despatch (Annex 2) was received the Acting governor has telegraphed that the congestion is becoming so serious as to jeopardise the continuance of the important and increasing transit trade with the Belgian Congo, which is conducted via the Central Railway from and to Dar-es-Salaam, a trid, which is very lucrative to the railway and which it is our policy to encourage and facilitate in every way. The Belgian Congo includes the western shore of Lake Tanganyika, and the Belgians are finding it very difficult to supply this vast territory from the western side of Africa, and are now sending large consignments of railway material, &c., via our railway. There is also an increasing outward traffic in Belgian copper. Last year some 1,700 tons were carried, and this year the Belgians want us to transport 10,000 tons. All this has to be shipped at Dar-es-Salaam, and the difficulty of handling it is becoming so great that the position may be described as critical.

It may be added that the increase of exports which is certain to follow on the construction of the feeder lines under schemes B and F will make further demand on the facilities of the port. As they exist at present, no such demand could be adequately dealt with.

In consequence of the specially urgent necessity for the harbour improvements, this scheme A is on a somewhat different footing from the other schemes in the schedule. It has been decided (and the Treasury have agreed) that harbour works must be undertaken whether as part of the scheduled works or not. The scheme was only included in the schedule because it is clearly an important feature in any general programme of development and because a considerable proportion, estimated at 34,000l., of the expenditure involved will be spent in this country and so help to relieve unemployment.

**Scheme B. – Tabora – Shinyanga Feeder Line.**

The advantages and prospects of this line are fully explained in Annex 1. As stated in paragraph 6, the original proposal was for a line of 80 miles in length, for which the earthworks, constructed by the Germans, are already in existence. This accounts for the fact that in this despatch (and in the summary in paragraph 2) the scheme is treated in two parts: from Tabora to Kahama (80 miles) and from Kahama for 40 miles further, to the neighbourhood of Shinyanga. The desirability of this feeder line to the most promising cotton district in the Territory was recognised by the Germans (who had begun construction shortly before the war) and has been pressed upon the Colonial Office from various quarters, including the local specialist of the Empire Cotton-Growing Corporation.
Schemes C and D. – Works at Kigoma (Lake Terminus) and Electric Power Station at Dar-es-Salaam.

These minor schemes may be regarded as subsidiary to the improvement of the traffic facilities on the Central Railway and to the Harbour Works (Scheme A). As stated in Annex 1, the slipway on the Lake was left unfinished by the Germans. Facilities at Kigoma are essential for the Belgian transit traffic referred to under Scheme A.

Scheme E. – Lindi Light Railway.

In paragraph 10 of Annex 1, and in the enclosure to that despatch marked ‘B,’ reference is made to a large scheme under which this railway or steam tramway (90 miles long) should not only be reconditioned but should be extended for about 50 miles further at a cost of about 158,000l. Such an extension may be desirable in the future, but the Governor brought strong arguments against the necessity for its being undertaken at present in preference to other schemes of development. The Secretary of State concurred in this view, so that the larger scheme is only mentioned here in order to account for the allusions to it in Annex 1. As indicated at the beginning of this memorandum, this is a scheme which was recommended by the Committee on Unemployment last year and announced in Parliament as ‘authorised.’ It seems, therefore, unnecessary to repeat the arguments, which have already been accepted in favour of the scheme, but it may be emphasized that it had the strongest support from the Empire Cotton-Growing Corporation, the district to be served being a very promising one from a cotton point of view. /

Scheme F. – Feeder Line from Itigi (or Manyoni) on Central Railway to Singida.

The reasons for this undertaking are similar to those for the feeder from Tabora (Scheme B). The waste of man-power in bringing produce to the existing railway is mentioned in Annex 1, Enclosure E, and the General Manager believes that the line will pay its way at once. It is important to remember that the Germans constructed the Central Railway, in as nearly as possible a straight line from the sea to the Lake, largely for strategic reasons, and that this line runs through large areas of unproductive country. It is obvious that the needs of so vast a territory are not adequately served by this one line, and that the sound policy for development is that of constructing feeder lines to the most promising districts. This (as mentioned under Scheme B above) the Germans had recognized by beginning the construction of the branch from Tabora.

‘G’ Rolling Stock, &c., &c. – This item requires no further comment except to call attention to the remarks of the General Manager in Enclosure C of Annex 1, to the effect that the 68,000l. suggested for these miscellaneous incidental services is only a proportion of what could be expended with advantage.
It may be desirable to mention that none of the three railway schemes included in the general programme are recommended in the interests of European settlers or plantations, which in fact do not exist in the districts which will be opened up. The feeder lines will encourage the development by the natives of the country of the produce grown on their own lands, which is an essential part of the policy of the Administration. The only European concerns immediately affected will be the cotton ginneries, the establishment of which will be assisted in every possible way by the Government. As regards the provision of funds and the annual amount which the Imperial Exchequer will be called upon to provide, there is no occasion to modify the statement of Sir Montague Barlow quoted at the beginning of this Memorandum, that the financial assistance should take the form of a loan free of interest for a time. The works in the Schedule may be expected to be completed in about three years, and, therefore, if the money could be spent in regular proportions there would be three annual installments of 500,000/- each. It is not possible, however, at this stage to make any reliable estimate of the actual amounts which will be required each year, and it is suggested that these should be determined annually in correspondence with the Governor and the Treasury in the same manner as the annual decision as to the loan-in-aid is arrived at. The development loan instalments would, in fact, be treated as a special and extraordinary addition to the ordinary loans-in-aid of Tanganyika revenues.

[...]

Colonial Office,

20th May 1924.

Postscript. – The following is an extract from *The Times* report of the debate in the House of Commons on May 22:–

Mr. SHAW, continuing, said that the Labour Government found that the late Government proposed to finance a railway in Kenya and Uganda. They had reaffirmed that proposition, and 3 1/2 millions would be spent. The Government were considering what they could do with regard to other railway works in Crown Colonies, particularly such railways as would tap cotton-growing areas and allow us to grow more cotton. Those were things vital to the future growth of Lancashire, and believing that a good thing was a good thing wherever it came from, the Government were going to try to do the work. (Ministerial laughter and cheers.)

Note. – After consultation with the Treasury it was decided that the funds required for the execution of such portions of the development programme as the Treasury were prepared to sanction should be provided from time to time, as required, in the ordinary estimates of the Territory, and that it was not neces-
sary to have recourse to the Unemployment Sub-Committee. The position was explained to Mr. Clynes, the Chairman, and the necessary instructions sent to the Governor. /

ANNEX 1.

The Acting Governor of Tanganyika Territory to the Secretary of State for the Colonies.

[Received 16th May 1924.]

No. 261.

Government House, Dar-es-Salaam, 

Sir, 25th April 1924.

With reference to the Governor's telegram No. 43 of the 27th March,* I have the honour to transmit herewith a copy of a report by the General Manager of the Railways which gives a résumé of the position with regard to the various railway and other schemes suggested in connected with the proposed Development Loan […].

2. The schemes are as follows:—

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Home Expenditure</th>
<th>Local Expenditure</th>
<th>Total Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Harbour Works, Dar-es-Salaam</td>
<td>34,000</td>
<td>59,000</td>
<td>93,000</td>
</tr>
<tr>
<td>B. Tabora – Kahama feeder line</td>
<td>241,000</td>
<td>182,000</td>
<td>423,000</td>
</tr>
<tr>
<td>+mKahama – Shinyanga extension</td>
<td>65,000</td>
<td>165,000</td>
<td>230,000</td>
</tr>
<tr>
<td>C. Slipway, seawall, &amp;c., Kigoma</td>
<td>13,000</td>
<td>15,000</td>
<td>28,000</td>
</tr>
<tr>
<td>D. Electric Power Station, Dar-es-Salaam</td>
<td>7,000</td>
<td>1,000</td>
<td>8,000</td>
</tr>
<tr>
<td>E. Lindi Railway</td>
<td>26,000</td>
<td>24,000</td>
<td>50,000</td>
</tr>
<tr>
<td>F. Itigi – Singida feeder line</td>
<td>170,000</td>
<td>430,000</td>
<td>600,000</td>
</tr>
<tr>
<td>G. Additional rolling stock, workshops, surveys, &amp;c.</td>
<td>34,000</td>
<td>34,000</td>
<td>68,000</td>
</tr>
</tbody>
</table>

£590,000 £910,000 £1,500,000

3. Dar-es-Salaam Harbour Works. – The Governor in his despatch No. 797 of the 3rd December† dealt fully with this matter. The necessity for extending the present wharfage accommodation and improving the facilities for the handling of cargo becomes daily more obvious. There is every indication that during the present year there will be a considerable increase in the amount of sisal, cotton and groundnuts exported from Dar-es-Salaam, while it is expected that 10,000 tons of copper from the Belgian Congo, as compared to 1,700 tons last year, will be handled at the port. The lack of proper appliances for dealing with this large

*  15095; not printed.
†  Annex 2.
volume of exports will undoubtedly cause serious congestion and may result in the loss to the Territory of some of the valuable transit trade from the Congo. The present appliances are not only inadequate, but are in such unsatisfactory a condition that they are liable to break down at any moment.

4. *Tabora – Kahama – Shinyanga feeder line.* – The reasons which led to the original proposal to construct this feeder line are the richness of the soil and the density of the population of the country through which it will pass, and the fact that, unless the Railway is brought nearer to their fields, the natives will be unable to increase their production for export, which is already greater than native porterage can handle. During 1922, 7,390 tons of native produce were exported by rail from Tabora and up to the end of October 1923, 7,123 tons had been railed. The bulk of this produce comes from the rich and populous areas north of Tabora. The average distance over which it has to be carried by porters is 50 miles; therefore, including the return journeys, 245,000 porters are required for 6 days in the year to carry this export produce only. This year production in the Tabora sub-district is expected to outstrip porter transport capacity, and in the Eastern Kahama and Shinyanga sub-districts it has already done so.

5. Production is still in its infancy, and there is no doubt that a large and rapid increase can be counted on. Ploughs have recently been introduced into the Shinyanga sub-district and the Director of Agriculture considers that within a few years the sub-district will be capable of an annual output of 8,000 bales of cotton. The natives of the country which will be tapped by the new line are intelligent and industrious. On the project being mentioned to them, they welcomed it with enthusiasm, and will readily supply labour for construction work. So greatly do they realise the ultimate benefit which the line will be to them that there is no doubt that they would, if asked to do so, supply much labour free.

6. The original proposal was to construct only 80 miles of line from Tabora. In view, however, of the fact that if the line is not extended further the natives of many parts of the fertile Shinyanga sub-district would reap little or no benefit from it, it is strongly recommended that the line should be carried forward a further distance of 40 miles. The General Manager of the Railways, who recently visited this area, considers that this extension would pay its way as soon as laid – see enclosure D of his report in which he fully explains the necessity for the extension.

7. *Completion of slipway, extension of seawall, and new cranes at Kigoma.* – The German Government had completed the underwater part of a patent slipway at Kingoma and had begun the construction of appliances on land. Only five out of 13 cradles for carrying vessels were *in situ* at the commencement of the war, and it is necessary to obtain the remaining eight cradles and to provide mechanical hauling gear for all 13. This slipway is essential for the overhauling and reconditioning of the Government ships on the Lake and will also serve the Belgian
Government who, having nothing of the sort at their own ports, would willingly pay for its occasional use.

8. It is also very necessary that the quay wall should be completed since the greater part of the existing wall lies within the Belgian concession, leaving us without adequate wharf accommodation for our own vessels. The existing cranage will also be insufficient when the Government steamers commence regular sailings.

9. **Engine and Dynamo for the Dar-es-Salaam Electric Power Station.** – It will be necessary to provide current for the electrical appliances required in connection with the new harbour works. The new plant will serve this end and leave a margin for revenue-earning purposes.

10. **Lindi Railway.** – In his despatch No. 811 of the 8th December,* the Governor fully explained the reasons for his attitude towards the proposal to extend the Lindi line into the interior. The experience of the last three seasons has shown that the up-country native producer of the Lindi District is unwilling to sell his produce to traders at up-country markets, but prefers to carry it to the coast rather than diminish its selling price by the cost of railway freight. There is little doubt that the line has so far not stimulated production, and in addition there is every reason to believe that for some years to come the running of the line will prove unprofitable. The line is distant from and not connected with the Central system, and this entails complexity of control and accounting and a consequent disproportionate increase of staff and supervision.

11. At the present time all produce has to be unloaded at Mingoyo, carried by porters half a mile, and loaded on shows at Mingoyo creek. It has then to be off-loaded at Lindi and stored in the Customs sheds before being finally loaded into ships. The proposal to continue the line from Mingoyo to Lindi will eliminate the delay and expense caused by the necessity of man-handling produce at Mingoyo, and should result in the up-country trader being in a position to offer a better price at up-country markets, which in turn may help to induce the native producer to sell at the rail-head rather than carry his produce to the coast. In any case the Governor is strongly of the opinion that it would be inadvisable to construct a costly extension into the interior until it is seen whether the present line, extended into Lindi and reconditioned as far as Masasi, will in fact result in increased cotton production. For this work it is estimated that 50,000l. will be sufficient, and a saving of 108,000l. which will be available for expenditure on other schemes of a more pressing and promising character, would thus be effected.

12. **Manyoni or Itigi – Singida Feeder Line.** – The reasons which render desirable the construction of the Tabora – Shinyanga line apply with almost equal force to this line. The land through which it will pass is fertile and well populated and the natives have already shown that they are able and anxious to
grow products for export. The distance of the thickly populated sub-district of Mkalam from the Central Line entails the use of a large number of porters to take produce to the Railway, and already, as in the Tabora District, the volume of export produce is greater than the available porterage can handle. In addition to groundnuts and grain, the trade of Singida in cattle and hides will benefit by this feeder line, which will also bring into closer touch with the Central Line the fertile country round about Ufhome.

13. The last item mentioned in paragraph 2 of this despatch is 68,000l. for rolling stock, workshops, surveys, &c., with the necessity for which the General Manager deals in Appendix C of his letter. The Rolling Stock referred to is required to deal with expansion of traffic on the main lines, and is in addition to rolling stock required for the proposed extensions, for which provision is made in the separate estimates for those extensions. Repairs and extensions to workshops, stores, carriage sheds, &c., are long overdue and have now become a pressing necessity; additional housing accommodation is also required before full effect can be given to the scheme for training African artizans and engine-drivers. The General Manager of the Railways estimates his requirements under these heads at 200,000l., about one-third of which could be met from the balance of the 1,500,000l. loan remaining after providing for the various construction schemes already referred to. I earnestly hope that you will be able to approve the allotment of the available balance in the manner suggested.

I have, &c.,

JOHN SCOTT.

TANGANYIKA RAILWAYS.

No. L.16/-. General Manager’s Office,
Dar-es-Salaam,
31st March 1924.
The Honble. The Chief Secretary to the Government, Dar-es-Salaam.

I now forward a complete résumé of the Railway situation up to date in regard to Loan development, as indicated by the cables from the Secretary of State.

A. Details of projects already dealt with.
B. Details of projects to make up the balance of 790,000l., as indicated in the latest cable from Secretary of State.
C. Remarks on general improvement.
D. Report on the Shinyanga area.
E. Report on the Singida area.
G. MAXWELL.

General Manager.
**Details of Schemes referred to in Secretary of State’s Telegram of 19th March, 1924.**

<table>
<thead>
<tr>
<th>Project</th>
<th>Description</th>
<th>In England</th>
<th>Freight and Local</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Harbour Works, Dar-es-Salaam</td>
<td></td>
<td></td>
<td>£93,000</td>
</tr>
<tr>
<td>B</td>
<td>Extension to Kahama, &amp;c.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) To relay Central Railway 80 miles 55lb.</td>
<td>130,000</td>
<td>112,000</td>
<td>242,000</td>
</tr>
<tr>
<td></td>
<td>British Standard Track</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) To relay Tanga Railway 65 miles 45lb.</td>
<td>86,000</td>
<td>20,000</td>
<td>106,000</td>
</tr>
<tr>
<td></td>
<td>British Standard Track</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3) Cost of extension to Kahama</td>
<td>–</td>
<td>50,000</td>
<td>50,000</td>
</tr>
<tr>
<td></td>
<td>(4) Two engines of type just ordered.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+m20 bogie wagons of 25 tons capacity</td>
<td>20,000</td>
<td>5,000</td>
<td>25,000</td>
</tr>
<tr>
<td></td>
<td>Total B†</td>
<td>236,000</td>
<td>187,000</td>
<td>423,000</td>
</tr>
<tr>
<td>C</td>
<td>Kigoma, slipway, seawall, &amp;c.</td>
<td>18,000</td>
<td>10,000</td>
<td>28,000</td>
</tr>
<tr>
<td>D</td>
<td>Engine and Dynamo Electric Light Station, Dar-es-Salaam</td>
<td>–</td>
<td>–</td>
<td>8,000</td>
</tr>
<tr>
<td></td>
<td>Lindi extension‡</td>
<td>60,000</td>
<td>98,000</td>
<td>158,000‡</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>–</td>
<td>–</td>
<td>£710,000</td>
</tr>
</tbody>
</table>

‘B.’

**Details of additional Schemes referred to in Governor’s Telegram of 27th March 1924.†**

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Description</th>
<th>In England</th>
<th>Freight and Local</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) Extension 40 miles beyond Railhead in A.</td>
<td>65,000</td>
<td>165,000</td>
<td>230,000</td>
</tr>
<tr>
<td></td>
<td>(See details below)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) Itigi – Singida feeder line. (See details below)</td>
<td>170,000</td>
<td>430,000</td>
<td>600,000</td>
</tr>
<tr>
<td></td>
<td>(3) Improvements and extensions of workshops and machinery Locomotives and rolling stock, survey party, &amp;c.</td>
<td>[34,000]</td>
<td>[34,000]</td>
<td>68,000</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td>£898,000</td>
</tr>
</tbody>
</table>

It is proposed to meet this expenditure by allowing 50,000/ only for Lindi Railway without further extension beyond Masasi and re-allocating 108,000/ to the Central Railway feeder lines:–

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance of 1,500,000/</td>
<td>790,000</td>
</tr>
<tr>
<td>Re-allocated from Lindi</td>
<td>108,000</td>
</tr>
<tr>
<td>Total</td>
<td>898,000</td>
</tr>
</tbody>
</table>

* 10433: not printed.
† 15095: not printed.
(1) The further extension of the Tabora Line for 40 miles to near shinyanga.

**COST:**–

When the Central Railway is relaid, about 100 miles of track (42 lb. German) will be available so that provision need only be made, as regards track for 20 miles, main line, stations, sidings, spares, &c., say 30 miles all told.

30 miles of 45 lb. British Standard Track (with extra sleepers) at 12l. per ton and 120 tons to the mile:–

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vale in England</td>
<td>43,200</td>
</tr>
<tr>
<td>Freight at 2l. 10s.</td>
<td>9,000</td>
</tr>
<tr>
<td>Total</td>
<td>52,200</td>
</tr>
</tbody>
</table>

It is difficult to say exactly, but 3,500l. a mile should suffice. At this rate 140,000. Station buildings, telegraph and telephone lines, instruments, goods sheds, water-running sheds, &c. Additional locomotive and 10 bogie wagons of 25 tons 12,500. Total 229,700.

Say 230,000l., of which 65,000l. approximate order on England.

(2) Singida (Mkalama) Line.

Looking at the map and the population in the matter of actual construction, I am inclined to think that 100 miles of the line will be sufficient. This does, not, of course, go to Mkalama Boma, but it would be much cheaper to move the Boma than to construct an extra 20 miles of railway:–

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>110 miles of 45 lb. British Standard track in England (12l. per ton, 120 tons to the mile)</td>
<td>158,400</td>
</tr>
<tr>
<td>Freight at 2l. 10s. a ton</td>
<td>33,000</td>
</tr>
<tr>
<td>Construction, probably 3,500l. a mile</td>
<td>350,000</td>
</tr>
<tr>
<td>Station buildings, water-running sheds, telegraph, telephone, &amp;c.</td>
<td>20,000</td>
</tr>
<tr>
<td>Two D.L. engines and 20 bogie wagons of 25 tons capacity</td>
<td>25,000</td>
</tr>
<tr>
<td>Total</td>
<td>586,400</td>
</tr>
</tbody>
</table>

Say 600,000l. complete.

‘C.’

Apart from railway construction and extension there are a great many vital improvements still necessary to put the existing railway and its premises on a sound footing.

As is well known, the Germans had most extensive plans for the improvement of their main stations, workshops, ports, &c., but the war prevented these

† See addition in following enclosure ‘B’ (1).
‡ See reduction of total to 50,000l., explained in enclosure ‘B.’ /
plans being carried out and left the British Administration a half new and half dilapidated property.

From the time I arrived in 1920, I have asked for money to make good the property as it existed, and my memorandum of October 1921 in reply to your 3516/6 of 12th October 1921, resulted in a loan of 250,000l., which just saved the situation, but which did not nearly cover what I asked for.

To show that I can easily spend the balance of 68,000l. on the Railway and can also spend any saving which might possibly accrue on the construction of the lines, I quote a few of the most important outstanding improvements:–

(1) The stores building at Dar-es-Salaam is hopelessly inadequate. Stores are kept all mixed up in sizes as there is no space. Stores are kept at Tabora for which there is no room in Dar-es-Salaam. For economy and efficiency there must be one good central store at Dar-es-Salaam. Plans are ready and this scheme is submitted as urgent.

The removal of the present stores will enable the workshops to expand and the station-yard to be improved.

(2) The state of the Dar-es-Salaam shops in places is beyond words. The corrugated iron roof is like lace in places and the rain has free access. The moulder’s shop is in such a position as to receive all the rain and to give out all its dust over the rest of the shop – a bad business for the bearings of machines and for the throats of the workers. An improvement scheme is submitted as urgent.

(3) Carriage stock has, in many cases, to stand in the open. This is, of course, highly uneconomical, owing to the deterioration and work entailed in repairs. Sheds are a necessity.

(4) Traffic promises to increase very largely, both locally and to and from the Congo, so that extra stock will shortly be wanted over and above the stock specifically asked for under Extension Heads.

(5) Our Asiatic artizan and engine-driver labour is of a most inferior class and is also unreliable. For years I have been working for the white artizan and trained African scheme, but have only been able to put a small part of the scheme into practice for lack of housing accommodation.

All the above are economies in reality which have been waiting for capital. They speak for themselves and will justify the expenditure easily in future economy and efficiency.

As a rough total, these demands, excluding staff, amount to about 200,000l., of which about 100,000l. would be spent in England.
Report on Reconnaissance of the District of Tabora – Northern Portion of Tabora Sub-district and Shinyanga Sub-district.

1. The original German formation was followed from Tabora.

   This formation is in very good order and will only require minor attention to make it perfectly good. The saving in expense by following this old line points to the advantage of following it as far as possible. I followed the formation as far as kilometre 120 and found the alignment good, many abutments and culverts built already, and stone collected in most places where no building had taken place. / …

2. […]

3. It would perhaps have been better had the line been constructed some 20 miles east of its present alignment, but the country is far more difficult when Karundi is passed, and certain quite large engineering works would be necessary, for river crossings, &c.

   The present line is the best alignment and must in any case be followed as far as Karundi, as the expense of making a new line would certainly not be justified.

4. Having arrived at Karundi, it remained to be seen whether the line could economically be developed to the east. I followed the formation to kilometre 120 to see where it arrived, and found an easy access to the northern portion of Karundi and to the highlands connecting Northern Karundi, Luhumbo, Tinde, Usule.

   These places would all be well served by an extension from kilometre 120 along the German survey towards Mwanza. The formation goes on towards Kahama, but no work, beyond survey, has been done after kilometre 120 towards Shinyanga.

5. It is, however, quite obvious that a terminus at kilometre 120 is not far enough and that new and further construction must be undertaken to the north and east, to get in touch with the really fertile and productive district of Shinyanga.

6. Having seen that the approach by the German survey was easy, I returned to Central Karundi with a view to seeing whether a deviation could not be made across Karundi to the north and east, to get into closer touch with Maungoye and Nzega (Ussongo).

   I took off at about kilometre 100 and examined the country to the east, via Kalembera, Senge, Sumbu (all in Karundi) through Kasiga’s in Maungoye, crossing the valley of the Muina east of Kasiga’s.

   (Note. – On existing 1,300,000 map Kasiga’s is called Masugu’s and the Muina is called Sagenda).
This river, Muina, is a serious obstacle as it would entail a large and expensive bridge to cross.

Proceeding further east I arrived at the ford of the Manyonga, the crossing of which would entail a large and expensive bridge again, the cost of which bridge alone would pay for many, many miles of construction.

The crossing of the Muina might be avoided by turning north and crossing only the Manyonga, but there would be a stiff climb on the north side to get up through Tinde to the Ussanda Hills, and the line would be incriminated to a passage to Shinyanga round the east of the Ussanda Hills, which would mean construction against the lie of the land and expensive work.

Still bearing in mind the service of Shinyanga, I proceeded round the east of the Ussanda Hills and followed the road to Shinyanga, nothing on the way that the valley of the Kitalu seemed to afford an excellent approach to Shinyanga from the highlands of Usule where the German survey passed.

8. After visiting Shinyanga I returned through Tindo to Luhumbo, and struck again the German Survey.

9. Realising that the German survey, as it exists west of the Mwantine Hills, is too far from the fertile parts of Shinyanga to be of use, I proceeded to Igalamia in Usule and found, as I thought, that an excellent diversion could be made here down the valley of the Kitalu to serve Shinyanga and pass northward through the edge of the Ushi to rejoin the German survey in Seke.

10. It must always be borne in mind that a railway should have a final objective, and in this case the objective of the future is undoubtedly Mwanza.

11. The German survey is the shorter and easier, but is buried in thick bush and in fly country, and therefore the longer route, giving easy access to ox transport from all Eastern Shinyanga, is much to be preferred.

12. This report is based on a hasty reconnaissance and no actual survey exists of the route I suggest, but I feel fairly confident that no great difficulty will be experienced in following this route.

13. Summing up, therefore, I recommend (1) that the German formation be followed to kilometre 120, as already asked for; (2) that the line be extended from kilometre 120 (new construction) along the line of the German survey for about 36 kilometres; (3) that the line be carried east from this point for about 30 kilometres to a railhead in a fly-free spot near Kisumbi. Roughly, 40 miles of new construction.

14. If this route the followed, the eventual main line to Mwanza will be some 10 to 15 miles longer than the direct German route, but will serve the country far better.

Also, if any difficulty should be found north of Shinyanga in joining back to the original survey, the last 30 kilometres might be looked on as a necessary feeder line for Shinyanga, and the original survey still followed for the main line.
15. I am greatly indebted to Major Stiebel for all the facilities afforded me in the district and cannot speak sufficiently highly of the information afforded me by Mr. C. McMahon, M.C., of Shinyanga, whose knowledge of the country and the natives and their requirements and aspirations enabled me to see very clearly what the desiderata of a railway were.

Mr. McMahon explained very fully the present position as regards marketing the crops and the loss of man-power, due to long head carriage. He convinced me absolutely that a railway only as far as kilometre 120 would be of little or no benefit to Eastern Shinyanga.

16. Mr. McMahon very kindly took me out some 12 miles into Usiha, from which point I was able to see still more of this wonderful country, adding thereby to my impressions of richness gained in travelling through Karundi, Maungoye, Luhunbo, Tinde, Usule, Samuye and Kisumbi.

The country is magnificent, the crops healthy and plentiful, all the cotton I saw looked well (from a non-expert view), the people are industrious, and the many chiefs of I talked to seemed keen and / progressive, and the personal views of Sultans Humba, Kasiga, Kaswende, Kapella, and Wamba led one to suppose (as is true) that transport is the one thing required to make the country a very useful asset to the British Empire.

17. The route I have recommended must now be analysed in regard to its distance from the chief centres of population and production.

It is, of course, impossible to follow every collection of people and, if a reasonable through line can bring the bulk of population within 20 miles, and the outlying population within 40–50 miles, I think the desiderata are fulfilled.

A rough centre of each sultanate has been taken and the approximate distances are as follows to the proposed railhead or nearer point on line:–

<table>
<thead>
<tr>
<th>Sultanate</th>
<th>Population</th>
<th>Miles</th>
<th>Sultanate</th>
<th>Population</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seke</td>
<td>7,000</td>
<td>20</td>
<td>Mundo</td>
<td>7,000</td>
<td>30</td>
</tr>
<tr>
<td>Usiha</td>
<td>31,000</td>
<td>20</td>
<td>Madui</td>
<td>12,500</td>
<td>25</td>
</tr>
<tr>
<td>Shinyanga</td>
<td>8,500</td>
<td>5</td>
<td>Ughunga</td>
<td>10,000</td>
<td>35</td>
</tr>
<tr>
<td>Usule</td>
<td>4,400</td>
<td>–</td>
<td>Uduhe</td>
<td>18,000</td>
<td>42</td>
</tr>
<tr>
<td>Tinde</td>
<td>21,000</td>
<td>15</td>
<td>Nyawa</td>
<td>20,000</td>
<td>50</td>
</tr>
<tr>
<td>Luhumbo</td>
<td>18,000</td>
<td>5</td>
<td>Ussongo</td>
<td>36,000</td>
<td>50 mostly within 40</td>
</tr>
<tr>
<td>Maungoye</td>
<td>5,000</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Karitu</td>
<td>4,000</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Karundi</td>
<td>32,000</td>
<td>10</td>
<td>Uvogo</td>
<td>7,000</td>
<td>25</td>
</tr>
<tr>
<td>Mpugi</td>
<td>3,500</td>
<td>–</td>
<td>Salawe</td>
<td>11,000</td>
<td>30</td>
</tr>
<tr>
<td>Kahama</td>
<td>18,000</td>
<td>10</td>
<td>Msalala</td>
<td>12,000</td>
<td>25</td>
</tr>
<tr>
<td>Ukamba</td>
<td>4,000</td>
<td>15</td>
<td>Kiguhumu</td>
<td>1,200</td>
<td>35</td>
</tr>
<tr>
<td>Ibanda</td>
<td>1,600</td>
<td>5</td>
<td>Ushietu</td>
<td>4,400</td>
<td>50</td>
</tr>
</tbody>
</table>
Other
Kahama
District

11,000  50

159,000  20 and under.

151,000  50 and under.

So that this line may be said to serve fairly the region of North Tabora District.

18. That portions of the railway as suggested pass through bush and fly is admitted, but the steady spread of cultivation into the bush and the attraction of the railway certainly lead me to suppose that in a very few years people will cut in towards the railway and an additional belt to bush and fly will be cleared. This will, I think, be especially noticeable in North Karundi and near Shinyanga, where the natives will keep their land open up to and round the railway instead of being inclined, as at present, to let the fly and bush push them further eastwards.

19. I can, therefore, recommend this further construction with every chance of the line paying its way as soon as laid, and the only remark further is that the sooner it is begun the better, as very large crops are being grown and even a few months may make the difference of a bumper market to the people, or their being left discouraged with a lot of produce on hand and no chance of transport to clear it away.

‘E.’

Feeder Line from Manyoni or Itigi to Singida and Mkalama.

This line is asked for purely as a feeder line. It is not likely ever to be a through line. Its construction seems warranted, however, on the following facts:—

(a) the country is rich and fertile. (b) The population is large:

- Wa Nyaturu  150,000
- Wa Iramba  120,000

(c) The work is not expected to be heavy.

The production of this district has increased very largely in the last year or two, and a stage is being reached where further production is impossible owning to the distance from the railway and the consequent number of porters required to bring in the produce.

Such a railway will probably pay at once, and allow all the man-power to be employed on producing instead of carrying, and thus assist a large area to become rich and prosperous.

261. ANNEX 2.

The Governor of Tanganyika Territory to the Secretary of State for the Colonies.

[Received 2nd January, 1914.]

No. 797. Government House, Dar-es-Salaam,
My Lord Duke, 3rd December, 1923

With reference to my telegram No. 226 of the 8th November, I have the honour to submit for Your Grace's consideration the report of a committee which I appointed to investigate the question of extension of the harbour works at Dar-es-Salaam and increased facilities for handling cargo at that port. The necessity of improving facilities is one which I regard as immediate. Production in this Territory is increasing rapidly and exports show a steady growth in volume, which must in turn lead to a greater bulk of imported commodities. Already there is periodical difficulty in handling goods which accumulate before the arrival of a ship, and this is due to the small number of lighters which can be discharged at one time. Complaints on this score are not infrequent, and I foresee that the time is not distant when serious congestion will occur unless the matter of increasing berthing accommodation and port appliances is taken in hand at an early date. I am quite confident in predicting that the volume of exports, which already in some items has passed the German records of 1913, will show very considerable expansion during the next three or four years, and it is important that this growth should not be impeded or checked by the lack of means to deal with it.

2. Mr. Hollis, in his despatch No. 365 of the 22nd May 1922, submitted to Your Grace's predecessor preliminary recommendations for the development of the principal ports in the Territory, and subsequently the Resident of Zanzibar kindly put at my disposal, for a short period, the services of Mr. Furlong, Resident Engineer of the Zanzibar Harbour Works, who examined the conditions in Dar-es-Salaam and drew up plans and estimates, providing for a quay alongside which two ships could be berthed at a time.

3. This scheme, which was estimated to cost approximately 500,000£, was discussed by my technical officers with Mr. Mitchell, of the firm Coode, Fitzmaurices, Wilson, and Mitchell, who was invited here for the purpose as suggested in Your Grace's telegram of the 10th [18th] May, Mr. Mitchell agreed generally with the proposed plans, but recommended a further survey of the harbour bottom, and observation of tides and currents, for a further period of 12 months before undertaking the main works. He, however, advised the immediate execution of certain improvements in the existing arrangements for handling cargo, including the construction of a crane jetty and modifications in the railway system on the wharves.

4. As plans were being drawn up to give effect to Mr. Mitchell's recommendations, certain difficulties and, disadvantages which would result from the

* 30908; not printed.
† 25167; not printed.
proposed scheme became apparent, and it was necessary to review the whole question again.

5. The results of the further deliberations of the committee are given in the enclosed report. I have examined the report and plans and have discussed them with the Director of Public Works, and I am fully in agreement with the proposals now put forward. I desire particularly to support the recommendations in paragraph 10 of the report. The further borings referred to in paragraph 9 are being proceeded with and have so far proved satisfactory.

6. Estimates for the proposed works [...] is also enclosed.

7. I suggest that advantage be taken of the presence on leave in England of Mr. Selander, the Director of Public Works, to obtain any further details or explanations which may be required regarding these proposals.

8. A memorandum by the Acting Comptroller of Customs, which accompanies the report of the committee, makes clear the necessity for an immediate improvement in the arrangements for handling the ever-increasing volume of imports and exports, and I can only urge that approval be given to the scheme now put forward, the necessary funds being made available by way of loan to aid the development of the Territory.

9. As stated in my telegram referred to above, immediate use can be made of two of the 3-ton electric cranes asked for, and if Your Grace is able to convey approval by telegraph, the details necessary for placing the order for these cranes will be forwarded at once. §

§ In view of the urgent demand for cranes, reported in subsequent telegrams, Treasury approval has been obtained for the placing of the necessary orders.

I have, &c.,
H. A. Byatt.
No. 1499 Public Works Department,
Dar-es-Salaam.
The Honourable the Chief Secretary, 2nd November 1923.

DAR-ES-SALAAM.

Dar-es-Salaam Harbour Improvements.

With reference to the Report of the Harbour Improvements Committee forwarded under cover of my letter dated 8th May last, and subsequent report by Mr. Mitchell of the Firm of Coode, Fitzmaurice, Wilson & Mitchell, Consulting Engineers, of 9 Victoria Street, Westminster, dated 26th May, the Committee now beg to submit an alternative scheme and estimate, which, in the light of their further investigation, they strongly recommend for adoption in preference to the deep-water pier scheme, which would involve an expenditure approximating to half a million pounds.
2. The scheme submitted herewith deals with the problem by means of a lighterage wharf as opposed to a two-berth deep-water pier.

3. The Committee were fortunate in obtaining the services in an advisory capacity of Colonel Nicholson, the eminent Harbour Engineer in South Africa, while he was passing through on his way to inspect the Zanzibar Harbour Works about a month ago. The plans and estimates now submitted are based on his recommendations and views.

4. Colonel Nicholson expressed a strong preference for a lighterage wharf, as opposed to a pier, this being in his opinion the most suitable and economical solution of the problem. This view was endorsed by Captain Rainnie, Managing Director, East African Lighterage Company, their wharfage adviser, who was visiting Dar-es-Salaam at the time, as also by other shipping authorities acquainted with local conditions.

5. The members of the Harbour Improvements Committee are in entire agreement with these opinions and they consider that an improved lighterage system will suffice for the needs of Dar-es-Salaam for many years yet.

6. The Scheme now put forward is estimated to cost 92,300l. and will involve therefore an expenditure approximating to one-fifth of the deep-water pier scheme. [...] It will provide a wharf 370 ft. in length, which will enable six lighters to be dealt with simultaneously. The scheme also includes a splay return of 290 ft. in length, which will be used in connection with existing dhow traffic, passenger landing pontoon, and dhow pontoons.

7. The estimate attached is inclusive of cranes and necessary equipment required for the expeditions handling of cargo. A transporter from the high level export shed to the wharf is provided for, and a sum of 5,000l. has been included for improvements to the lower export shed, which it is proposed to convert into an import shed. This arrangement will, in the opinion of the Acting Comptroller of Customs, provide sufficient shed accommodation for years to come. (Comptroller of Customs letter No. H.W./1424, dated 30.10.23, copy attached.) The estimate also makes provision for such services as Supervising Staff, Electric Lighting, Water Supply, Drainage and Railway facilities.

8. Colonel Nicholson expressed his opinion that there would probably be no necessity for the employment of a dredger in connection with the scheme submitted, as cranes and grabs, working from the wharf itself should be able to keep the lighter berths clear. For this purpose the estimate provides for 3 grabs, each with a lifting capacity of 27 cubic feet.

9. Borings on the proposed line of the wharf are now in progress and the results of these will be forwarded in due course. In this connection, no serious difficulties necessitating modifications of the scheme are anticipated, as previous borings for the deep-water pier scheme have revealed a uniform distribution of sand and clay in the vicinity of the proposed works.
10. It is recommended that the whole of the work, if the scheme is approved, be carried out by the Public Works Department.

11. Should the scheme as outlined be approved, specifications and detailed drawings will be prepared and submitted.

12. The Committee consider that the proposed scheme can be carried out without dislocation of the work of the port, and recommend that two of the four three-ton cranes provided for in the scheme should be obtained in advance to facilitate the work of the port during the period of construction of the new wharf.

J.E. Selander (Chairman)
Robert M. Raven Members.
C.T. Hewlett-Cooper
E.C.F. Bird

Provisional Estimates for Proposed Extension to Existing Wharf, D.S.M.

Summary.

<table>
<thead>
<tr>
<th>Description</th>
<th>£ s. d.</th>
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<tbody>
<tr>
<td>Reinforced concrete work</td>
<td>45,221 8 0</td>
</tr>
<tr>
<td>Minor works</td>
<td>1,235 2 0</td>
</tr>
<tr>
<td>Electric works</td>
<td>1,000 0 0</td>
</tr>
<tr>
<td>Buildings</td>
<td>5,953 10 0</td>
</tr>
<tr>
<td>Machinery</td>
<td>21,300 0 0</td>
</tr>
<tr>
<td>Special plant for casting yard and water supply</td>
<td>1,595 0 0</td>
</tr>
<tr>
<td>Staff</td>
<td>8,855 10 0</td>
</tr>
<tr>
<td>Contingencies</td>
<td>7,630 0 0</td>
</tr>
<tr>
<td></td>
<td>£92,790 10 0</td>
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</tbody>
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Say
£92,800

Provisional Estimate for Proposed Extension to Existing Wharf, D.S.M.

Reinforced Concrete Work in Piles £ s. d. £ s. d.

Longitudinal and cross framing anchor blocks, &c. 26,781 0 0
Do. in 8-in. decking panel retaining wall, &c. 6,657 0 0
33,438
Concrete paving, including new paving to existing wharf, &c. 1,970 9 0
Hardwood fenders, rubbers, bollards, &c. 2,844 0 0
Puddle clay backing filling behind retaining wall, Rip Rep slope, &c. 4,610 10 0
Crane track and railway track on wharf, including points, crossings, &c. 2,358 9 0
Carried forward £45,221 8 0 /

Minor Works. £ s. d.

<table>
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<tr>
<th>Item</th>
<th>£ s. d.</th>
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</table>
| Brought forward                                           | 45,221 8 0  
| To removing existing passenger landing pontoon, cranes, jetties, &c. | 237 10 0  
| Reconstructing submerged pier for dhow traffic            | 260 12 0  
| Removing passenger landing pontoon, dhow pontoons and tidal gangway | 475 0 0  
| Surface water drainage and alterations to existing outlets | 262 0 0  

**Electric Works.**

<table>
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<th>Item</th>
<th>£ s. d.</th>
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</table>
| Electric light work on wharf and to Customs sheds, also laying cables for cranes, &c. | 1,000 0 0  
| Improvements to lower export shed (vide para. 7 of Report) | 5,000 0 0  
|                                                           | 5,953 10 0  

**Machinery.**

<table>
<thead>
<tr>
<th>Item</th>
<th>£ s. d.</th>
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</table>
| Four 3-ton electric travelling cranes                      | 14,000 0 0  
| One 15-ton electric travelling crane auxiliary light tackle | 5,000 0 0  
| One transporter                                           | 2,000 0 0  
| Three 1-ton grab buckets for loose sand                   | 300 0 0  
|                                                           | 21,300 0 0  
| Special plant for casting yard                            | 1,095 0 0  
| Allow for water supply                                     | 500 0 0  
|                                                           | 76,305 0 0  
| Contingencies 10 per cent. on £76,305                     | 7,630 0 0  
| Provisions for additional staff, passages, consulting Engineer’s fees, &c. | 8,555 10 0  
|                                                           | £92,790 10 0  

Say £02,800

From The Comptroller of Customs, Dar-es-Salaam.

To the Chairman, Harbour Board, Dar-es-Salaam.


30th October 1923.

With reference to our meeting this morning I desire to make the following comments:

2. The scheme put forward by Colonel Nicholson appears to offer the best solution of our present difficulties in handling the trade of this port. The scheme is economical, quick working, and need not unduly interfere with the discharge of vessels whilst it is under construction. Although I am firmly of opinion that the trade of this port will increase yearly and considerably, the new lighter wharf
as planned will, with proper organisation, be adequate for dealing with it for many years to come. Included in the scheme is provision for rebuilding the present lower export shed and for a transporter from the large top export shed. When this shed is completed I propose using it for imports only, and so relieve the quite appalling congestion that frequently occurs in the only import shed at present available. By increasing the width of the wharf a useful marshalling yard will become available for cargo that is marked for immediate loading or delivery, and the top export shed will then be ample for all export cargo that needs temporary storage accommodation.

3. On my way through Mombasa I met the chief of the African Wharfage Company and was shown letters and figures proving conclusively that Dar-es-Salaam was anything but a favourite place of call for steamers on account of the hopeless delay at present occasioned by the complete lack of facilities for working cargo. This is a most undesirable state of affairs, and if we are to develop normally and without hindrance, it is essential that improvements be made as rapidly as possible. If I appear to over-emphasize the necessity for immediate action it is because for the last two years I have been made so painfully aware, through constant complaints, of the inadequacy of the present arrangements.

E.C.F. BIRD,

*Acting Comptroller of Customs.*

CONFIDENTIAL.

NATAL GOVERNMENT RAILWAYS.

No. 2.

DRAFT LAW

(Enacted by the Lieutenant-Governor of Natal, with the advice and consent of the Legislative Council thereof),

To raise a Loan for the construction and equipment of certain Railways in the Colony of Natal.

WHEREAS by ‘The Natal Government Railways Law, 1875,’ the Lieutenant-Governor is empowered to make, maintain, equip, and work the following railways, namely:

(A.) The Main Line. – A railway commencing by a junction with the existing line of railway at Pine Terrace, Durban, and terminating at the city of Pietermaritzburg, at a point near to Government House.

(B.) The North Coast Line. – A railway commencing by a junction with the existing line of railway at a point near the Umgeni River, and terminating at the town of Verulam.

(C.) The South Coast Line. – A railway commencing by a junction with the intended line of railway (B) from Durban to Pietermaritzburg, at a point about four and a half miles from Durban, and terminating at the village of Isipingo, and provision is made for alterations of the gauge of the existing railway from
Communications in Africa, 1880–1939: Volume 2

Durban Harbour to Umgeni, and for the purchase or lease of the railway and undertaking of the Natal Railway Company. / And it is expedient to make provision for raising, by way of loan, funds for the purposes of the said Law.

Be it therefore enacted by the Lieutenant-Governor of the Colony of Natal, with the advice and consent of the Legislative Council thereof, as follows:–

1. This Law may be cited for all purposes as ‘The Natal Government Railways (Funds) Law 1875.’

2. In this Law –

   The expression ‘the Lieutenant-Governor’ means and includes the Lieutenant-Governor or Officer administering the Government for the time being.

   The expression ‘debenture’ means a debenture or other security issued under the authority of this Law.

   The expression ‘the railways’ means the railways and works authorized to be constructed and executed, and purchased or leased as aforesaid, or any of them. And,

   The expression ‘the Crown Agents’ means the Crown Agents for the Colonies in London for the time being.

3. The Lieutenant-Governor may from time to time borrow upon debentures, or upon such other form of security as he shall think preferable, such sum or sums of money, not exceeding in the whole the sum of one million and two hundred thousand pounds sterling, as may be required to pay for the construction of the railways and works, and for all necessary services and labour in connection therewith, and for the purchase of such lands, easements, and other property as may have to be purchased for the same, and for the purchase of all requisite materials, plant, engines, rolling stock, and other things in connection with the railways and the equipment and working thereof, and other purposes of the said recited Law, and may employ and empower the Crown Agents to negotiate and to effect the loan hereby authorized. /  

4. The principal money secured by every debenture issued under the authority of this law, shall bear interest at a rate not exceeding 6l. per cent. per annum, and such principal money and interest shall be and are hereby charged upon and made payable out of the general revenue and assets of the Colony, but subject to all now subsisting debts and sums of money charged on such revenue and assets by virtue of any law heretofore passed.

5. The interest on the principal money secured by any debenture shall commence from a-day to be named in the debenture, and shall be paid half-yearly at the office of the Crown Agents in London, and the principal sum secured shall be paid at the same place, on a day to be also named in the debenture, and being not more distant than forty-five years from the 15th day of November, 1875.
6. The debentures issued under this Law may be issued at the par value thereof, or at a premium upon or discount from the par value, as the Crown Agents shall deem to be expedient at the time of issue.  

7. Every debenture shall be signed by the Colonial Secretary and the Colonial Treasurer of Natal, and be countersigned by the Crown Agents or one of them as agents or agent for the negotiation of the loan hereby authorized, and be registered before issue in Register Books to be kept for that purpose in the office of the Crown Agents.  

8. To every debenture shall be attached, at the time of the issue thereof, coupons for the payment of the interest upon the principal sum secured by the debenture, to become due in each half year, either during the whole period during which the debenture shall have to run or a part of such period, as the Lieutenant-Governor may determine.  

9. Every debenture and coupon shall be transferable, and the right to receive the principal money and interest respectively secured or represented thereby shall pass by delivery.  

10. The Lieutenant-Governor shall appropriate and set apart in each half year, out of the general revenue of the Colony, a sum sufficient for the payment of the interest accruing in such half year on the entire amount of the principal monies borrowed under this Law, and for the time being owing, and shall remit the sum so appropriated to the Crown Agents in London, in time for the payment of such half year’s interest when the same shall fall due.  

11. The Lieutenant-Governor shall half yearly, commencing from the 15th day of November, 1880, also appropriate and set apart out of the general revenue of the Colony, and in like manner remit to the Crown Agents, a sum of money equal to the half of 1/ per cent. of the entire amount of the principal moneys so borrowed, and for the time being owing, in order to form a sinking fund as hereinafter provided. Trustees of sinking-fund to be appointed.  

12. The Lieutenant-Governor shall, with the approval of the Secretary of State for the Colonies for the time being, nominate and appoint two or more persons to be trustees for the purpose of the sinking fund, and may from time to time, with the like approval, nominate and appoint other fit persons to fill casual vacancies in the number of trustees occasioned by death or otherwise, so that the number of trustees may never be less than two.  

13. The Crown Agents shall pay over to the trustees for the time being all sums remitted to them as last aforesaid, and the trustees shall accumulate the same to form a sinking fund for the redemption of the loan hereby authorised by investing the same sums, and all the resulting income thereof in some one or more of the securities of the Imperial Government of Great Britain, or of the Government of any Colony or Dependency of Great Britain.
14. The trustees may from time to time apply any part of the sinking fund in the purchase of debentures issued under the authority of this Law. All debentures so purchased, and the interest coupons attached thereto, shall be immediately cancelled or destroyed. Subject to this power of applying the same the sinking fund shall be applied in payment, as and when the same shall become due, of the principal moneys for the time being owing on debentures issued under the authority of this Law pari passu, and without any priority.

15. In case the sinking fund shall be insufficient for the payment of all the principal monies borrowed under the authority of this law at the respective times when the same shall have become due, the Lieutenant-Governor shall make good the deficiency out of the general revenue and assets of the Colony.

16. All expenses of or incidental to the management of the sinking fund or the purchase of debentures, or the repayment of the principal monies to be borrowed under this law, shall be paid out of the sinking fund.

17. Every debenture, the principal money secured by which shall be repaid, shall be delivered up to the Crown Agents, and be by them immediately cancelled or destroyed.

18. No money shall be reborrowed, nor shall any reissue of debentures be made in respect of any debentures purchased or paid off and cancelled or destroyed as aforesaid.

19. All moneys borrowed under the authority of this law shall be applied to and for the purposes for which the same are hereby authorized to be borrowed, and in payment of all costs and expenses of and incidental to the borrowing of the same, and for no other purpose whatever.

20. This law shall commence and take effect from and after the Proclamation by the Lieutenant-Governor in the 'Government Gazette' of Her Majesty’s assent to the same.

Given at Government House this day of

By command of his Excellency the Lieutenant-Governor.

CAPE OF GOOD HOPE.

REPORT

OF THE

SELECT COMMITTEE

ON

RAILWAY LABOURERS.

Ordered by the House of Assembly to be printed.

JULY, 1863.

[...]
REPORT

OF THE

SELECT COMMITTEE appointed by the HONOURABLE the HOUSE OF ASSEMBLY on the 2nd July, 1863, to take into consideration the Message of His Excellency the Governor dated the 25th June, 1863, respecting the provision to be made with regard to certain Railway Labourers.

Your Committee are of opinion that it would not be desirable for the Government to provide passages back to England for any of the labourers referred to in the Governor’s message, for although there may be a temporary want of employment for men of this class, owing to the approaching completion of the Cape Town and Wellington Railway\(^1\) before any new line has been commenced in the colony, and owing to the present slackness of work for this description of labourers in the country districts, arising from the season and other causes, the Committee cannot but look forward to an early revival of such employment; and it would be a subject of regret that any of these men, who may soon again be required and whose labour may be so useful to the colony, should be sent out of it.

The Committee cannot admit that, because the Government made a grant to Mr. Pickering in aid of the introduction of these men into the colony, it is either legally or morally bound to send them back to England or to provide them with employment in the colony, in consequence of any failure on Mr. Pickering’s part to fulfil his engagement. But the Committee have reason to believe that, if the question were raised of Mr. Pickering’s liability under his contract with these men, or a majority of them, it will be found that he was virtually released from it.

The Committee consider that the best course for the House to adopt is, to authorize the Government to provide suitable employment for any of these men who cannot otherwise obtain it, after satisfying that they are really unable to do so, and under such arrangements as will not offer inducements to enter and depend upon such employment when they can procure it elsewhere.
PROCEEDINGS OF COMMITTEE.

[...]

Friday, 10th July, 1863.

PRESENT:

Colonial Secretary (Chairman),

Mr. Solomon,                     Mr. Franklin.

Mr. Harries,

Mr. A.T. Andrews examined.

1. Chairman.] You are the resident engineer of the Table Bay harbour works? – Yes.

2. The Government have reason to apprehend that a certain number of railway labourers, who were introduced from England to the colony by Mr. Pickering for the railway works, are being discharged, and will be discharged in still larger numbers upon the completion of the work, before they can find other employment of the same kind in the colony. We are anxious, if possible, to prevent the necessity of their returning to England, or being sent back to England, or of becoming idlers or something worse about the town, and therefore would be glad if we could find fitting employment for them in Cape Town or the neighbourhood. We are anxious to know whether such employment could not be found for them on the Table Bay harbour works, where, it appears, they could be well employed in the kind of labour they are accustomed to?

– A short time ago the Governor sent for me and questioned me very much to the same effect. I then told him that we had as many men as we could well employ; that we had nearly 150 men over the number estimated for; and that to take on more would unfairly increase the cost of the works. I did not see where I could employ them, but as it seemed very necessary that they should be employed, and / that something should be done, I offered to take about a score of the men. I did so; but their services are not well laid out, and I could very well spare them.

3. How long ago was that? – About three or four weeks ago. The Municipality took a number, I believe, at 2s. 6d. a day. I found it would not do to pay these twenty men I took on at 2s. 6d., for they had to work with men who were getting their 4s. or 5s. a day, so we have put them on at 4s. 6d. This puts them on a par with the other men, and comes cheaper in the end, for you cannot expect men getting 2s. 6d. a day to execute the same amount of work as those getting 4s. 6d. or 5s., and unless they do the same work they could not work well together. It comes cheaper to pay them better wages; and 4s. 6d. a day I consider very good wages, and that the great bulk of our men get. One of the great difficulties we have to contend with in the employment of large bodies of men in the construc-
tion of the works with free labour is to give them as much space as possible, that they may not be in the convicts’ way. I have considered the subject very well over, and I really do not see how we can take on more. It would be very difficult to work them with the convicts; and then there is another reason: the great expense of employing men to do the work estimated to be done by convict labour for nothing; that is to pay men 4s. 6d. for doing the work of others who are paid nothing. It would cost us a large amount extra every week.

4. How many free labourers did you estimate for? – About two hundred, and we have three hundred and thirty now.

5. Mr. Franklin] What number of navvies are now engaged on the Works? – I can hardly say how many navvies.

6. Chairman] If the Government had the opportunity when such men presented themselves, complaining that they cannot find labour, of saying – ‘Very good, go to the harbour works; you will be taken on at such a rate of wages,’ – that would at once relieve us of the difficulty? – Of course, it would relieve the Government of the difficulty; but then the difficulty comes in my department – that of finding a place for them to work. But I object also on the score of expense, and that really must be looked at.

7. The objection of the expense would be got over if the Government bore a proportion of the wages? – Yes; that was very much the case when the railway works were stopped. We paid the men 5s. and the Government repaid us 2s. 6d. But even then we did not get our value for the 2s. 6d., for the men knew that they had been taken on as an act charity, and when I complained of the way in which they worked they said, ‘Don’t find fault with us, we shall be away again in a few days;’ and it was of no use threatening to discharge them.

8. But the present circumstances are quite different; there it was a temporary suspension until the company and Mr. Pickering had come to a settlement, and awaiting the decision of the Supreme Court. Here the men are discharged from work with no immediate anticipation of any similar works being undertaken, and therefore the circumstances are very different. Do you find that those now employed work differently from any of the others? – Yes, in those now employed; there is a great feeling on their part that they are taken on because the Government must find them something to do. I have told them, in order to stimulate them in their work, that I would give those steady at their work a permanent job; for they know they are only sent there to be kept out of idleness. A great many of them are at times away; on Mondays, especially, the half of them are away.

9. Is that the case with the other men? – No, not so much as with them. These men feel that the Government have found them something to do, only to keep them out of mischief.

10. Mr. Harries.] You stated you found a difficulty in finding room for the men to work; but, in such a large area as the works cover, cannot you find a new

Mr. A.T. Andrews. 10th July, 1863
spot to break ground? – Our works extend really over a small space; we only
cover eleven acres, and with eight hundred men, they lie very close in that area.
We are now working almost entirely at the docks, and concentrating the men
more and more. This very morning, the overseer of the convicts pointed out to
me that some of the convicts were mixed with the free labourers. I really should
object to receiving any more men, unless they were sent entirely as an act of char-
ity.

11. Chairman.] How could you employ them under such an arrangement?
– There are some pieces of work that might be done, but if I had to pay for
it, I would not do it – such as leveling ground, &c., but that can be done, at
future day, by convict labour. I have promised the military authorities to slope
the ground about the Amsterdam battery;3 there / would be a few months’ work,
but as there is no time fixed for doing it, I do not like to employ paid labour for it.

12. But if the Government paid all the wages? – Yes, of the greater part, but I
would not like to pay more than a shilling a day, – the same amount that convict
labour costs us, – for horses and men.

13. Would not the difficulty with regard to these men loitering, and not giv-
ing a fair amount of work for their wages, be removed if they were employed
on piece-work and paid for work done? – There are a great many objections
to piece-work. I do very little of that, owing to the men standing out for such
enormous wages for piece work, and requiring such a great deal of inspection.
Sometimes a man will take piece-work at so much a cubic yard, on hard, stony
looking stuff, and perhaps, after a day’s work, come upon soft stuff, and make,
perhaps, 10s. a-day. I have been letting out some work as piece-work to mechan-
ics, this week, and it turned out very much better than was expected, and they
made nearly £3 a week at it. If we had no convicts, and the work was very much
of the same character, I would let nearly all the work; but I always take advantage
of convict labour where it can be used, because it is so cheap. With piece-work
this cannot be done.

14. Is it not worth while to let them earn a good rate of wages at piece-work:
do not they do such a quantity of work as to repay you? – It may be that it comes
to us to the same thing at the end; but, at all events, it would be very much
against the system now pursued. Instead of paying two men wages at the rate of
4s. 6d. a day, one man would earn 9s. and one man stand idle. Where I have now
seventy men at work at day-work, I would only have forty men if they worked at
piece-work; the forty men would do the same work as the seventy at day-work,
and the consequence would be that thirty men would stand idle. I would still
pay the same amount of wages, but it would tell against the employment of many
men.

15. The upshot, however, is this: if the Government found itself in a diffi-
culty with those men, how could you put them to such work as would enable us
to dispose of them for a while? – I could find employment for them for a short
time but it must be really looked upon as quite an act of charity in taking them
on; I could only lose by it, and the work would cost more than it was estimated
at. / 

16. But still this is public work, and the employment of those men is a public
object? – Still, I have to look to my estimate; and when the work is three parts
finished, and the money spent, I know who will get the blame.

17. You have only to report that in the year 1863, between the months of July
and December, you had in your employment one hundred railway labourers, and
that the cost of the work was increased by so many hundred pounds; that would
account for the excess over the estimate? – Still, I see so much blame attached to
works exceeding the estimates, that I think it may, perhaps, be attached to me.
I should not like to see the docks three parts finished, and left standing in that
state for want of funds.

18. Mr. Solomon.] But then if that objection were removed; if the men
employed were paid by Government? – We have now at least twenty-five men
at the works who are not profitably employed, and I should be very glad if the
board were to give me instructions to discharge them.

19. Are these, then, men sent down by the Governor? – Th
they have come
down to me since I saw His Excellency.

20. And you have given them employment only in consequence of their
being in want of employment? – Entirely on account of His Excellency impress-
ing upon me the necessity for doing so.

21. Mr. Franklin.] You can hold out no prospect to take on, profitably, any
further supply of men, excepting they do not cost you more than convict labour?
– Yes. Every day the work is drawing into a smaller compass; but if the board
were to sanction any new work, I could take them on. There has been some talk
of making a boat-harbour which has been taken up by a committee in the other
House, which I attended. On such a work I could employ fifty or sixty extra men;
it would be another work, carried out quite distinct from the harbour works.

22. Chairman.] Have you any idea what a boat-harbour would cost, accord-
ing to the idea of those gentlemen who proposed it? – I was looking over the
matter last night, and I think that for £4,000 or £5,000 a good boat-harbour
could be made.

23. What area would it hold? – About 400 feet square, about 600 feet long,
and would hold all the fishing-boats and other small boats in the bay.

24. Where would you construct it? – Off the Sailors’ /

Home, between that and the Central Causeway. The committee that I
attended yesterday said that the fishermen complained very much of the bad
place they had for their boats and I was asked if it was possible to make a boat-
harbour I said that I would look into it, and I did last night. I have thought over the matter before, and I have no doubt that it would be a very profitable work.

25. Mr. Harries. I think, in more than one of your reports, you have complained of the want of more convicts: has that want ceased to exist? – Yes. At that time I had 130 convicts; now, I have 425. I was then employing free labourers to do convicts’ work. I have the full complement now, viz., 400. That is the number I calculated I would require for the dock. If I had many more men I should require additional plant, and have to get more horses and wagons, and go to other expenses.

26. Chairman. How long would a boat-harbour occupy in construction? – I could hardly say; but I should think between twelve and eighteen months.

27. What number of men would you employ? – I think about fifty, not more.

28. They will take material from your excavations? – Yes, and the rest of the material from the excavation that they would have to make. I should think it would only take twelve months after they were fairly started.

29. Mr. Solomon. That would be a profitable work? – Yes, and a great benefit. The fishermen complain that they are being ruined; that they are driven from place to place that they have no place for their boats; and they have to pay so much money every year on account of breaking their boats in beaching them.

30. Chairman. Have you any further suggestion to offer with regard to the employment of these labourers? – None at all, unless the Government undertake some work in the colony that they may be employed upon.

31. None has struck you in the immediate neighbourhood of Cape Town? – No; excepting the reservoir for the water supply of Cape Town; and considering how short we run of water, and how little water we have in the summer, it seems to me the most important thing that can be carried out; and they are the very men for that work. It could be commenced without any delay. You would only require a few wheelbarrows, pickaxes, and shovels, and begin upon it to-morrow. You require no rails, trucks, or anything else; it is all dirt. It is a great pity it is not commenced now; it is the very time for it, for the ground is soft, and labour is abundant. As they go on now, the winter rains would consolidate the work; and if it is done in summer it would have to be continually watered. I may as well mention to the committee that out of the men we engaged in England twenty men left us, almost as soon as they came here, to go to the railway for higher wages. They were engaged in England at 4s. 6d. per day, but they were offered 6s. at the railway. Some of these men have been back to me lately and asked for work.

32. Mr. Solomon. I suppose you did not care to keep them? – We could not keep them, though they were under contract for three years.

33. But you did not enforce the contract? – We tried that, but we could not find them to levy summonses. I think we only punished one man. He had gone
up the country and taken a contract under Mr. Pickering, and boasted that he had only contracted with us in England at 4s. 6d. per day to get a free passage. He only worked with us one day, and then went to Mr. Pickering. We could not get hold of him; but some time afterwards we heard he was going to New Zealand, we stopped him; took all his money form him, some £10 or £15, and then let him go.

34. Mr. Harries.] What is your average rate of wages? – The lowest is 4s. 6d., and the highest 6s.; the average is 4s. 11d. All the quarrymen for boring and blasting get 5s., for filling wagons, 4s. 6d., drivers, 5s. 6d., and a few head quarrymen, 6s. I have a good many men who came out here for Mr. Pickering, and who have stayed with me ever since. Mr. Pickering was there one day and recognized some of them and spoke to them. They told him they would not go back.

35. Mr. Franklin.] What was the reason of that? – Either that they had more wages or had had quarrels with the foremen. He spoke to me about it. I told him that he had twenty of my men. The whole of Mr. Pickering’s men were engaged in England for 4s. I found this out by applying for a copy of the contract of Mr. Pickering’s firm in London. I made my contract in the same way, with a slight exception. Mr. Pickering’s men were engaged for specific trades; for instance, a man was engaged as a carpenter, / another as a blacksmith, and so on. I put in my contract ‘to work,’ and did not specify what particular work they had to do. As soon as the men came out they struck for higher wages, and got it. Men who had come on for Mr. Pickering at 4s. per day earned as much as 15s. One of the men went to England and commenced an action against Pickering for breach of contract; that man had let and worked for me, and I gave an affidavit to that effect, and he lost the case. I had given him 7s. a day and his agreement with Pickering was for 5s. All my men who were engaged at 4s. a day in England now receive 5s.; with the exception of mechanics, all the men receive higher wages.

36. Mr. Solomon.] What wages do that class of men receive in England? – The highest wages I paid was from 3s. 4d. to 4s. per day, and that in London, which is a very dear place. In the country less is paid. On the Norfolk railway works they receive from 2s. 3d. to 3s. per day and very good workmen they get for that.

37. Of course, living is much cheaper there? – I do not think so very much. These men live chiefly upon meat, and the cost of their living here is not very different from what it is at home. They pay 17s. per week here for everything including board, lodging, and washing. They live very well and have the best of everything for that. The difference the cost of clothing is not great, for in England they principally wear cloth, and here they generally wear canvas.

38. Mr. Franklin.] Do you know of your own knowledge that all Mr. Pickering’s men struck for higher wages? – I know that Mr. Pickering’s men were paid very much higher wages than they had agreed for; for he not only told me so
himself but his men told me so, and I have now several men with me who were engaged by Mr. Pickering at 4s. in England, and who told me that they had got as much as 10s. a day as soon as they had demanded piece-work.

39. That may be the reason why Mr. Pickering did not fulfil his contract, because they broke theirs? – Mr. Pickering told me, at the time he stopped the works, that some his men had tried to compel him to pay them 4s. a day when they were doing nothing; but they could not enforce this.

40. Mr. Solomon.] You do not see anything so easy or so desirable, connected with the works under your charge, as a boat-harbour, for the purpose of giving employment to those men? – Yes; or some other extra work not forming part of the present design. I consider the present works quite full, and I do not know of a more suitable work to employ them upon than a boat-harbour.

41. And you consider that it is a work both needed and desirable? – I think it is very much needed; the evidence upon that point is very strong indeed.

42. Chairman.] When the docks are completed will this boat-harbour be necessary; could they not land in the outer basin? – It will not suit fishing-boats; they will have to come into Cape Town with their fish, and if they had to land it in the docks they would have to bring it into town in carts; and this is what they are afraid of. Another thing is, the fishermen are anxious to beach their boats, and we cannot give them that accommodation in the docks. In the boat-harbour that I would propose, we would give them a good beach to haul the boats up, and it being enclosed they will be out the surf in landing. At the present time they are nearly drowned in beaching the boats through the heavy surf.

43. What would be the monthly expenditure on fifty men, at a rough calculation? – About £300 per month. Much plant would not be wanted; you would only require a few horses, and a ganger or two. I may add that the Governor asked me if I could recommend any work for these men. Of course, looking generally all over the colony, I would fix upon what I consider the best place. I think that the most important work that can be executed is to make a railway and a wharf at Knysna. I would carry a railway from the wharf up to the forest. When you consider the enormous quantity of sleepers and timber that is used for railway purposes, it is a work of very great importance. It could be done at very little cost. I have been down there and examined the place, and found one of the greatest impediments to the wood trade to be the carriage over eight or ten miles of not very good road; and then, when brought down to the water’s edge, floated off to the vessels. These men could be started down, and they would be the very men for the work. A great many of them are rough carpenters in their way, and could do all that would be required. You could erect a steam-mill in the forest and bring down any amount of timber by rail, and I am certain that the expense of the sleepers will be less than we pay for those we get from England, and the
money would be spent in the colony. In a short time you could get something like 100,000 tons of materials for the railways and other purposes.

Mr. Robinson examined.

44. Chairman.] You are the Acting Colonial Engineer and Chief Commissioner of Roads? – I am.

45. Are there any works now being carried on in the neighbourhood of Cape Town, or within a reasonable distance upon which railway labourers seeking employment could be employed if necessity should arise? – I know of none; we are only repairing roads, upon which we have the men usually employed. I do not think there is any opening for the description of labour; if there is, it can only be in a very limited form.

46. There are no quarries to be opened, for materials? – No. All expenditure is at present drawn into the narrowest limit.

47. It has been suggested that Sir Lowry’s Pass and the Houwhoek Pass should be widened? – I do not think Houwhoek requires widening. Sir Lowry’s Pass is narrow in one part; it has been widened in the course of the last three years. It would require but a very small number of men but there is no money on the estimates for it.

48. But if it became necessary to find employment these men, and the Government provided the funds in excess of estimates, what employment could you find for them. There is a very small amount of work in Sir Lowry’s Pass it is quarrying work, or blasting work.

49. Not removable by picking and wedging? – No is heavy, hard sandstone, which would require skill in blasting.

50. Mr. Franklin.] Are there any works in the Easter Province on which these men might be employed? – I not know of any. At the Katberg, of course, they have convict labour. On the Fish River Rand there might be an opening for fifty men, but that would be done by people in the country, who are usually employed on those works; and is too long a distance to send these people down, as it will be finished in a short time.

51. If the Van Staden’s River heights were commenced, would there be an opening then? – The Van Staden’s River / heights is estimated at £4,700, and we have only £1,000 on the estimates for improving that piece of work.

52. Is it a work suitable for this class of men? – Clearly; and it is a work which could be done by piece-work.

53. Chairman.] You have heard the objection Mr. Andrews stated with regard to the employment of men on piecework? – No.

54. He stated that the nature of the soil varied so much that it was difficult to fix the rate of piece-work, so as to pay equally? – That difficulty frequently arises; but by a careful attention, and only giving it out in small quantities, it can be satisfactorily regulated. It is a very important road to open, and a work that
must be done. If I might make a suggestion with reference to the employment of these men, I hardly think a more beneficial employment than making reservoirs along the main roads could be found. I particularly noticed the necessity for these works in my annual report to the Government; it is the greatest difficulty the country labours under. It would be a very great assistance, not only to travellers but also to the carriers and stock, who have now to go miles before they can water their oxen. It is just the work for these men to do, and precisely the work they are accustomed to. Unless you have travelled over the country and know the roads well, you cannot realize the fearful difficulty and distress the want of water occasions.

55. Mr. Harries.] In the event of there being a party told off for the work at the Van Staden's River, has the line been laid out, or is there any person there to do it? – Mr. Pilkington is in the neighbourhood, and he would lay it out certainly in three months. He would lay out sufficient work for fifty men to begin in a month, as soon as they got there.

56. Chairman] With reference to your last observation, in what localities do you consider these dams most wanted? – I think they are especially required on the Port Elizabeth and Graaff-Reinet line of road, – the new line comparatively recently formed. I travelled that road with horses, and though there was sufficient grass, I had to ride ten or twelve hours before I came to water.

57. Is there the same want between Graham's Town and Port Elizabeth? – Yes; you want one reservoir at least in the lower country, about thirty-five miles from Port Elizabeth, when you get into the Zandveldt.

58. What would be the cost of dams of such a nature? – I cannot give any positive opinion upon it; it would depend upon the soil and a variety of circumstances; but I should think from £1,000 to £1,200 each.

59. Mr. Franklin.] Would any of the material have to be brought to it? – Nothing but the timber.

60. Mr. Harries.] Would you contemplate making dam at the Coega? – Yes; but the Coega is at no very great distance from Port Elizabeth; it is about fourteen miles distant.

61. That is a good distance for ox wagons? – Yes; and water is now scarce for twenty-four miles from Port Elizabeth.


63. How many men would you put upon one of those dams? – Not more than twelve or fifteen.

64. Could the officer in charge of the Van Staden's River work superintend at the same time the construction of the dam between Van Staden's River and Port Elizabeth – Certainly.
65. Have you any suggestion to offer the committee with regard to the employment of railway labourers during the remainder of the present year until railway works are under taken in the colony, supposing they could not find employment? – Nothing further than the matter suggested, – Van Staden’s River height and reservoirs along the main road. I know of no new work where they could be economically employed.

Mr. J. A. Ross examined.

66. Chairman. ] You are the secretary to the Municipal of Cape Town? – I am.

67. The Government has been in correspondence with you upon the subject of the employment of certain railway labourers who have been thrown out of their recent employment on the railway, and who have not been able to obtain employment elsewhere. What have you been able to do in that respect? – About a month ago, I received a letter from the Governor, stating that a number of men were out of employ, – not only railway labourers, but others as well. The Governor asked the Municipality whether they could find work for these men. The letter was referred to a committee / and they recommended that a number of these men, about fifty, should be taken on at a reduced rate of wages, in order to see whether they really wanted work. It was proposed to give them 2s. 6d. a day; this was agreed to by the commissioners. The next day, I particularly noticed the kind of men that came for work, and to my surprise I found that out of the fifty there were only two navvies; all the others were sailors discharged from vessels, discharged soldiers, and tradesmen, and very respectable men indeed there were among them; there were also one or two engineers, blacksmiths, carpenters, all out of employ. One stated that he had been an engineer on board of some steamer. Shortly after these men were taken on I sent a note to Mr. Rivers, communicating what had been done, and gave him the result of my inquiry. Subsequently to this, Mr. Rivers sent me a note, stating that a number of navvies were up at Government House asking for work, and inquiring whether we could not make arrangements to take them on. The Governor stated that, if we would take them on at 2s. 6d. a day, there was a person who would find them in board and lodging for 17s. 6d. a week, and that whatever was short he would make good at the end of the week. Eleven men came to us, and they were certainly men that I should be sorry to see leaving the colony at any time, for they were very fine and useful men. These men worked very well, and gave great satisfaction; but it seems the rate of wages was too small, for they gradually disappeared, and we have not a single one of them left. Out of the fifty first taken on we have only forty-four left now.

68. How are they employed? – Quarrying stone, repairing streets, loading carts, and so forth.
69. Mr. Solomon.] What do you think has become of these eleven men you speak of? – I believe they have gone to look for work elsewhere.

70. But are you sure they have not got employment elsewhere? – I am not sure; but one of the men I saw in the street talking to another, and evidently not in work, so that I am under the impression that it is the same with the others; perhaps they are going about looking for work.

71. Chairman.] Do you employ them by the day or by piece-work? – By the day; it was a mere labour test – suggested by the Governor and the Rev. Mr. Lightfood, because a number of men went to the Dean and applied for assistance / pleading that they could not find any work. It was done to ascertain whether they really wanted work or whether it was mere pretence.

72. Mr. Solomon.] Are you aware whether any number of coloured labourers are out of employ? – I think not many.

73. Chairman.] Would you be able now to find employment for any considerable number of men? – If our engineer had been in the colony we could have found employment for about sixty or seventy men by piece-work, because we are contemplating the erection of a large reservoir at the Platte Klip, and these navvies are just the men for it.

74. Could you not make arrangements for commencing the excavation of the work in the absence of Mr. Penketh – I do not think it would be advisable in the absence of the engineer, who has drawn up the plan and prepared the estimate, to commence such an important work.

75. When do you expect him back? – In about four months. But we have just given out a large work in building drains in Darling-street, and the contractors might require navvies to assist them. They will have to excavate a trench across the Parade about ten feet square, at which these men could be very well employed. I am not aware whether the contractors have already engaged men or not.

76. Who are the contractors? – Messrs Levi, Holmes, and Sons. That work will be commenced immediately.

77. What is the amount of the contract? – £3,000 masonry work included.

78. What proportion of that is excavation? – The tender for the excavation was £750.

79. Mr. Harries.] If your engineer were in the colony you would be prepared to pay full wages to the men required to make this reservoir? – Yes; we would employ them on their own terms. We would pay so much for so many cubic yards; if a man worked hard he would earn more, and vice versa.

80. Mr. Solomon.] You have the means for carrying out that work? – Yes, we have borrowed the money; it was intended to commence it long ago.

81. Do you think that the municipal commissioners would be prepared to undertake any works at once, upon condition that a portion of the expense of
the work was paid out of the public revenue: would it be worth their while? – I think so. It strikes me they might be profitably employed in the preparation of macadam until the reservoir was commenced. /

82. Would you purchase macadam from Government in any quantity, supposing Government were to employ these people, and lay it by in store? – Yes, we could purchase a great quantity, at a fair price; but we could not agree to take it at once, there being a contract for it for the present year. If the Government decided to employ these men, I think the Municipality would pledge itself to buy the macadam, and pay for it in the course of next year.

83. Chairman.] Is there any convenient locality in which the Government could employ these men for breaking stone, and where we could keep the stone in any quantity until you wanted it? – Yes; just above Martin's Church. The present contractor brings the stone there, and makes it up into square heaps; it is then measured, and left there until wanted. I may mention that the first day these fifty men I have referred to came to us for work, they were furnished with a new pick and spade each, of the value of about six shillings. Two of the men who went with the others to the quarry never reached it, and we never saw them or the tools again. It was reported that these men were navies, but that was a mistake; one of them was a sailor, and I forget what the other was.

84. Mr. Harries.] Have you any fixed rate for this material? – We pay 4s. a cubic yard; that is, for hard stone. There is another kind of stone – flint-stone, which only costs us 3s. 6d., because it is more easily broken.

85. Chairman.] Have you any further suggestion to offer the committee with regard to the employment of these men by the Municipality, the Government providing a larger or smaller proportion of the funds? – The question is, what number of these men are likely to be out of employ shortly. I have not seen many of them about, with the exception of the few I mentioned, who, as I said before, would not come at the price offered them.

86. I think there are seventeen men now employed in the Botanic Garden: when their labour is completed there, what employment could you find them? – They could be advantageously employed in supplying macadam.

87. Do you think it would be impracticable to commence the reservoir? – The commissioners have decided not to commence it until Mr. Penketh returns.

88. Mr. Solomon.] If certain advantages were offered them to induce them to commence it; supposing the Government were to say that for the present it would, to a certain / extent, give a proportion of the wages, would not that induce them to make some progress with the work? – It might induce them, but I do not think it likely.

89. Mr. Franklin.] When did you take on the fifty men you spoke of? – About a month ago.

Mr. J. A. Roos,
10th July 1863.

Mr. J. A. Roos.
10th July 1863.
90. Since that day you have not heard of many men being out of employ-
ment? – No; excepting a few whom we could not take on because they were
 unfit for work.
91. They were not navvies? – No; all the navvies the same we took on.
92. Chairman.] How many men of that class do you not employ? – Not one.
93. Mr. Solomon.] The commissioners have borrow money for certain pub-
lic works; what work is it borrowed for? – For drainage, the reservoir, and a new
market. The drainage is to be done in several places. The Darling-street drain has
to be covered over, and one in New-street; a drain is to be made in Shortmarket-
street, and there is also one now constructing in Buitengracht.
94. Do you contemplate commencing any of these immediately? – The
New-street and Buitengracht drains have already been commenced, and the
Darling-street drain will be commenced in a few days.
95. Will that give employment to some of these men? – Yes; principally the
Darling-street canal will give a great deal of work.
96. Have you any further suggestions to make to the committee? – No.
97. Mr. Bourne examined.
98. Mr. Bourne.] You are the Colonial Railway Engineer – I am.
99. You heard the opinion expressed by Mr. Andrews with regard to the
employment of railway labourers. Do you consider that it would be desirable for
the Government to enter upon any works such as that proposed? – It would, no
doubt, be a great advantage eventually to be able to bring timber and sleepers at
a cheaper rate from the Knysna forest and the plan suggested by Mr. Andrews
would have the effect; but I doubt whether it will answer the purpose of giving
employment to these people immediately. In the first place, you would have to
make surveys of the country in order to take the line to the best timber dis-
tricts, and, as much as possible, over Crown lands, and this, of course, will take
time; and you would have to expend a considerable sum of money. Supposing
it only costs from £2,000 to £3,000 a mile, then the railway would cost about
£30,000, according to Mr. Robinson's estimate of the distance – ten miles. The
importance of it will depend, also, entirely upon the proposed railways being car-
ried out and constructed, which will not be decided upon until the next session
of Parliament.
100. You have heard the evidence that has been given today. What has pre-
sented itself to your mind as the best mode of employing these labourers? – I
think the first thing to be done is to endeavour to make arrangements with the
Municipality. The reservoir seems to be the most important work; they have the
money for it, and would probably be induced to commence it at once if they had
assistance from Government. I think I understood the secretary of the Munici-
pality to say that the plans and specifications are all ready, but that they object to
commence the work until the return of their engineer. If a sufficient inducement
were held out they might begin at once, and give employment to these people immediately. Some of the men might find employment under the contractor for the drains. I have no doubt that fifty men, or more, might find employment in the Eastern Province, – if not on the Port Elizabeth breakwater, at all events on the Van Staden's River height, or the reservoirs that Mr. Robinson suggested. Of course, these are works that would not give any return. I think that a reservoir might advantageously be made between Mossel Bay and Riversdale, in one of the tributary kloofs of the Gouritz River.
It took several long strides before I reached Nigeria. Had it not been for my bosom pal Charlie I suppose I never would have set foot there. Charlie was forever romancing about foreign parts and of how fortunes could be made in any other country but the one of our birth. The field of Art looked uninspiring, so that when volunteers were called for [to deal with] a war in South Africa I could not resist the arguments and urgings of my friend to break away from the rut that, seemingly, was leading me nowhere. Five shillings a day for twelve months, passage paid to South Africa, fed and clothed for that period, at the end of which I could stay in that delightful country and start on the process of acquiring a fortune. Charlie would of course accompany me.

To a youth of nineteen the prospect was singularly thrilling and alluring. Without much ado Charlie and I presented ourselves to the recruiting sergeant, whom we rewarded with a silver crown on his assurance that we would be among the fifty men selected out of the five hundred that had volunteered. But [as] Charlie, the prime incitér to foreign adventure, changed his mind, without his
company [I sailed] into the blue to find myself ultimately in the Orange Free State just before the war ended.

My discharge came in April 1903, bringing with it a medal with three clasps, and a gratuity of five pounds, which /

This is a record of how a West African railway came into being. It tells of the construction in Northern Nigeria of the Baro-Kano railway. First of all it may be of interest to narrate the events that led up to its inception and construction.

Before the year 1900 the territories which ultimately became designated as Northern Nigeria were administered under Royal Charter by the Royal Niger Company. It was a vast land of some 275,000 square miles with a population estimated to number nine millions souls, composed of Hausa, Filani, and Nupe races and numerous pagan tribes. The country was divided into twelve Emirates or States, each ruled by an Emir. From a fairly high degree of civilisation extending back some centuries they had lapsed into an era of barbarism and constantly made war, one with another. Lnds were overrun, devastated and desolated. Rape and ruin were the order of the day. Captives were forced to slavery, human sacrifices and other horrors prevailed. It was no fit place for any peace-loving to be found wandering in, with the exception, perhaps, of a few areas contiguous to the Niger river, where Europeans could conduct trade in comparative safety. The Niger Company, under the aegis of the British Government, controlled and employed a constabulary under Colonel (afterwards Lord) Lugard for the development and protection of its interests in the hinterland. /

It was sometimes about 1897 that certain European Powers in Africa were casting envious eyes on native countries that remained free from foreign domination. The northern territories of Nigeria seemed a good marks. Already the French from the north and west nosing about the country, as were, also, the Germans from the east. There loomed the possibility of spheres of influence being established, to be followed, as a natural sequence, by complete annexation. A clash with the French at one time seemed imminent, but, fortunately, was averted.

The British Government realising that the power and authority of the Niger Company are inadequate, and spurred to action by the far-seeing and visionary Lugard in a situation complex and dangerous, abrogated the Charter. It was enabled, thereby, by diplomacy, to settle all contentious problems with its two neighbouring Powers.

The military occupation of the country – new the Protectorate of Northern Nigeria – followed and by 1905 the newly acquired territory effectively settled down to the peaceful pursuits of trade and industry. To consolidate this vast acquisition and to promote its economic development became and urgent and pressing problem, for no roads existed and transport of commodities was only possible by head-load along native bush
paths, except in the far north where animals could live and be used as beasts of burden. French policy, now that its power had been denied from the Protectorate, sought to attract the trade of the western provinces by planning a railway in the neighbouring country of Dahomey from the Coast to run close to the Nigerian boundary, while in the north caravans of hides, skins, and other kinds of merchandise crossed into the French Soudan to wend their way to Morocco, returning with the wares and produce of other countries.

Lugard, who had been appointed High Commissioner of the Protectorate, alive to what might prove a dangerous strategical situation urged the immediate construction of a light railway of 2 feet 6 inches gauge, built on pioneer lines, not alone on the grounds of military expediency but, as well, for the effective political administration and development of the country’s potential trade resources. The Southern Nigeria Government then became interested, for it looked forward to an amalgamation of the two territories in the no distant future. It strenuously opposed a narrow gauge railway as it had itself constructed and was extending a line of the wider 3 feet 6 inches gauge to connect with a future northern system.

After protracted discussions the matter resolved itself when in 1907 Sir Percy Girouard succeeded Lugard. Favouring the 3 feet 6 inches gauge he obtained the sanction of the Imperial Government for the construction of a great central railway. Girouard was a soldier of the Royal Engineers who had achieved considerable distinction in India, Egypt and South Africa in railway work, perhaps the most notable being the rapid construction of the line in the Dongola expedition under Kitchener during the advance on Khartoum.

The railway would have its terminus at Kano, which was, by far, the most important and most populated trade centre in the Protectorate. But to get to Kano a suitable starting point had to be found on the River Niger. The necessary material for construction would have to be transported from England to the coast port of Forcados, and then transshipped to shallow-draught river steamers. On the bend of the great river stood the little village of Baro, some 407 miles from Forcados, a place hitherto of little importance, except as a ferry crossing for caravans from the north to Lokoja and other southern towns. At this point the river stretched fully one mile across. Here were found all the conditions adaptable to the enterprise: ground spacious enough for a big railway depot and a depth of water between the months of July and September which would enable steamers of 6 to 12-feet draught to bring material from Forcados. Thus, railway and river would provide the main outlet artery for northern traffic until such time as a junction with the southern line from Lagos could be effected.

Girouard intended to construct the line according to his own method and ideas. The track would be of the pioneer type, pure and simple, to be built quickly and cheaply without any fancy trimmings or expensive buildings or other works, and to be of sufficient use to meet the needs of the moment and the immediate
future. Posteroty could strengthen the whole structure if and when conditions required it. Three years was the time limit set for reaching Kano, some 360 miles from the starting point Baro. One and a quarter million pounds had been sanctioned for the work. / 

Girouard wasted no time. Surveyors were soon in the field plotting the route to be taken. The various Government departments were scoured for men who could turn their hands to engineering work and the supervision of construction gangs. Men, who could be spared, rolled in from the ranks of the military, the Public Works, the Political, and other department all keen to participate in this important undertaking. Although it was in its general make up a scratch team it got things going until the more highly skilled and technical railway personnel arrived. Being a Royal Engineer officer Girouard prevailed upon the War Office to allow a contingent of Sappers to come out for laying the track, an innovation in Colonial railway building and commendable for the opportunity it provided the Sappers for gaining practical experience.

It may be said that the Baro-Kano railway construction formally started on the seventh of January 1908 with the cutting of the first sod by the Emir of Bida at an inaugural ceremony. Political officers organised the recruitment of labour and exercised control in the native interest through village chiefs. For the most part the native worker was raw and unskilled. In supreme control of all the works Girouard had appointed an experienced engineer-administrator, the late Sir John Eaglesome.

Baro, now grown to a goodly-sized railway camp, bustled into activity – a race against time – preparing for the reception of material coming out from England. Stacking ground had to be prepared, sidings laid, jetties constructed, engine sheds, stores and quarters erected. Only three months (July to September) when the river was high, would be available for discharging the / boats – those of up to 1000 tons – coming from Foroados. After that, up to January, only very light craft could be navigated.

In July the boats began to arrive, but one suffered a disaster when it struck a rock below Lokoja and much of the sorely needed tools, rails and sleepers were lost. Discharging at Baro continued feverishly day and night. Each boat when emptied hastened back the 400 odd miles to Forcados for more cargo and was back again in an average of seventeen days.

It was a triumph of organisation. Thirty thousand tons of material were landed in Baro by the end of November, double the quantity it was estimated could be transported in the time.

Tow years continuous hard-driving in, at times, sweltering heat and torrential downpour brought railhead to the banks of the Kaduna, river, 215 miles from the base, Baro.
Tracklaying did not wait on the completion of bridges. If the bridge, or culvert, was not ready to take the material train a temporary expedient was resorted to: the line of rails would be diverted to run on a light formation and stiff gradient across an earth embankment through which galvanised pipes had been laid, for in the dry season most of the stream and river beds carried little, if any, water. But when the floodgates of heaven opened it became a continual struggle to keep these deviations intact. The water steadily rising would finally overtop the embankment and carry away the whole earthen structure, leaving only the rails suspended in mid-air.

By supreme exertion and constant vigilance the trains got through to Kaduna, which was now the receiving depot for all the material required. Kaduna, then a wilderness of bush, was ultimately to become established as the administrative centre and capital of the north.

So far the platelaying programme had kept fairly well to the set timetable. It was now the closing weeks of 1910 and there were still 138 miles of track to lay, and if the objective Kano was to be reached early in 1911 the operation would have to be hard and sustained. Thousands of native workmen were well ahead building up the formation for the track. Could the operation be accomplished in the time? There was no mistaking the air of confidence that prevailed in the camp at Kaduna that it would.

Everyone was keyed up and eager to get going on this last lap and to complete the work before the coming of the rains. Prominent in this enthusiastic, and now highly trained, contingent of platelayers was a body of Sappers fresh from leave in England under the direction of Captains Mance and Hammond.

At last the bridge over the Kaduna river was finished to allow tracklaying to begin. It shot rapidly ahead and, laying over one mile a day, the rails were at the important town of Zaria on the 24th January 1911. Fifty miles of track had been laid. Pushing forward with undiminished vigour the great task became accomplished when early in March the objective Kano was reached.

It was a noteworthy performance and notable for the fact that in this last phase world's record had been set up by the laying of six and one-third miles of continuous track without the aid of special track-laying machinery in a single day. / 

As so, in a little over three years from the cutting of the first sod a railway of 353 miles had been built in the heart of Northern Nigeria, over 400 miles away from the Coast. The Baro-Kano railway had by its achievement fully justified its adoption of unorthodox methods in West African railway construction. /
INTRODUCTION.

All those diaries recording my comings and goings over a quarter century of my lifetime, all those accumulations of letters, newspaper cuttings, reports, statistics and notes, must join them, to be converted into pulp by the ravenous waste paper merchant. I have finished with them; they are so much junk, and as such, deserve the fate in store for them. Out of the miscellanea has emerged a chronicle of events which sheds a light on the work of the railway engineer in West Africa, and shows how a tropical railway came into being.

Much has been written about Nigeria. Its bibliography steadily grows. But its railway has received scant notice. That a railway can have a story or history would seem ludicrous to many people, for the popular conception about any railway is that, like Topsy, it has simply 'grewed', and that is all there is to it – no glamour, glory, or romance. Yet that great steel highway, with the offshoots, has been a vitalising force in the development of Nigeria. It stands to-day a worthy and lasting memorial to those far-seeing Empire statesmen, and Colonial Administrators like Sir William MacGregor, Sir Walter Egerton and Lord Lugard, who planned its foundations.

If I have succeeded through the irrelevancy of a background of personal, and, perhaps, trivial, matter in throwing into the limelight of documentary record a picture of the railwayman's share in the process of building up a great and interesting tropical dependency I shall then be happy to think that the task I have essayed has not been without reward.

STEPPING STONES

It took me a long time to reach Nigeria. Had it not been for George I suppose I never would have got there. George was for ever romancing about foreign parts and of how fortunes could be made in any other country but the one of our birth. The field of Art looked uninspiring, so that when volunteers were worked for a war in South Africa I could not resist the arguments and urgings of my friend to break away from the rut that, seemingly, was leading me nowhere. Five shillings a day for twelve months, passage paid to South Africa, fed and clothed for that period, at the end of which I could stay in that delightful country and start on the process of making a fortune.

To a youth of nineteen the prospect was singularly thrilling and alluring, without much ado George and I presented ourselves to the recruiting sergeant, whom we rewarded with a silver crown on his assurance that we would be among the fifty selected men out of the five hundred that had volunteered. But the prime inciter to foreign adventure, changed his mind, without his company I sailed into the blue to find myself ultimately in the Orange Free State just before the war ended.
My discharge came in April 1903, bringing with it a medal with three clasps, and a gratuity of five pounds, which I thought a very generous recognition of my war service. The five shillings I received in lieu of a suit of civilian clothes was not so generous; I could never understand by what process of reasoning or method of calculation a set-up of civilian attire had been so valued, unless it was intended I should clothe myself native fashion.

I had by now become disillusioned about fortune making; all I wanted was suitable employment, which was hard enough to secure. Therefore, when the Cape Government Railway, instead of offering me an appointment, agreed to give me a trial in the clerical branch of its engineering department, I accepted, and was content for the time being. But having been duly installed in office I found my fingers always itching to give expression to the artistic proclivities that filled my soul. I could not resist the temptation to caricature my fellow workers, from the head down to the office boy. The drawings, displayed around the walls of my office, having caught the eye of the head, instead of incurring his displeasure had the opposite effect. I was ordered to apply art with pen and pencil in another direction. To an understaffed drawing office I was transferred, there to become immersed in plans and sections, and all the works and schemes usually associated with the railway engineer. Like the duck that takes to water I at once took to draughtsmanship, and thenceforward set myself to acquiring as much knowledge as possible of everything pertaining to the practice of railway engineering.

But the post-war boom failed to hold, and the inevitable slump descended upon the country with considerable force. Fortunes were lost instead of won. Retrenchment became the order of the day, and when my colleague Symons received his congé I felt regret, for I would miss his company, when with pencil and paint we would roam the picturesque countryside endeavouring to portray its beauty.

However, Symons was not to remain long out of the picture. From Lobito Bay in Angola (Portuguese South-West Africa) came a telegram saying a job was waiting for me there if I cared to accept it. The urge within me to gain greater experience was strong. After four years with the Cape Government Railway I came to my third stepping stone.

On March 23, 1907 the sun-baked coast of Angola hove in view after 1,600 miles of ocean travel. The Primitive little timber wharf in Lobito Bay shuddered as the ‘Gaika’ bumphet, built upon a finger of land that had been nothing but sandy waste some eighteen months previously. It was littered with the paraphernalia of the kind of railway construction material that ultimately resolves itself into an organized railway system. And here and there through it all darted tiny engines, puffing and shrieking, as though they were the most important elements that made up the general scheme of things.
I was now a human cog in the machinery of a grandiose railway project having for its objective the tapping of Central Africa, where lay immense fields of copper deposits in the Katanga province of the Belgian Congo. But engineers were in insufficient numbers for the huge task in hand. Although nominally a draughtsman I became an engineer in embryo for I had drifted into the use of the engineer’s level and theodolite and was setting out works, completing plans and preparing estimates. I advanced to such a degree as to become fairly knowledgeable in the theoretical and practical field of railway construction.

It so happened that the termination of my twelve-month agreement with the contracting company coincided with a cessation of its activities in Angola. Funds for the further construction of the line had come to the point of exhaustion. But the Benguella Railway company, which had its office in London, had enough money left to extend the railway survey farther into the interior. I learnt that after I had spent a few months at home. I was invited to join a survey party being formed, and as the inducements were attractive, I accepted. And thus my fourth stepping stone had been reached.

My return of Lobito Bay found the place looking woebegone, and almost deserted. The fussy little shunting engines were nowhere to be seen, but the railway functioned with one-train-a-day service. I pushed up 128 miles of its length to railhead, and there, instead of surveying, I assisted in the completion of a bridge, culverting and the ballasting of track whilst waiting for the members of the survey party to materialise. At the end of six weeks I was working with them over rolling country of forest and bush, through fierce thunderstorms and torrential downpours, and in broiling heat. It was a grueling training ground for acquiring practical knowledge of railway location survey, livened in spare moments by game hunting, in which the bush abounded. Although my status was that of a draughtsman I was not satisfied until I had been allowed to work in the field with the party. My assistance was welcomed for it helped to speed up our daily progress.

Then after some months misfortune overtook me. The mosquitoes laid me low with a raging attack of malarial fever. I had become delirious and my condition so serious that a hammock had to be improvised to carry me to railhead, where a train was waiting to convey me to Lobito. I lay in the hospital there shrunken to nothing but skin and bone. The it was discovered I had one disease on top of another for enteric was diagnosed, but with appropriate treatment I was placed on the road to recovery and was able to rejoin my colleagues of the survey.

Soaking rain or blazing sun we plodded on grimly day by day mapping out the course in the direction of Bihe. And through it all intermittent doses of malaria occurred, weakening and impairing my energies, until, at length, I was obliged to relinquish my post and sail for home. The work, however, was nearing its end,
for funds to extend the location were becoming exhausted. Apparently the great undertaking could progress only in fits and starts. It seemed to me at the time destined to be a white elephant and likely to end up in a line of rusted metal somewhere in a wilderness of bush. But it did reach its objective, Elizabethville, 1,300 miles from the coast, in 1828. A traveler in 1933 had this to say about it:

To travel into Africa by the Benguella railway is to wonder at the work of the pioneers. Every sleeper of it cost a life, they said, for the fever was so bad. Perhaps, a highly colourful way of saying that it wasn’t all beer and skittles for the pioneers.

It was in the latter stages of my sojourn in the Angolan bush that I became aware of Nigeria, when an offer of employment as assistant engineer on the Lagos Railway reached me, but now at home and restored in health after shaking off more malarial attacks, I was to be informed by the Crown Agents for the Colonies that the Lagos Railway had now no use for my services. I had wondered how they knew of my existence, but it transpired later that it was through John Norten Griffiths, who had not forgotten his disbanded Lobito Bay staff.

I looked to the world where other railways were being, or likely to be, built. I sounded consulting engineers and contracting firms. I wrote to one John Eaglesome, the big noise of a railway which had recently been started with the object of opening up the vast territory of Northern Nigeria, a region which my map showed me to be about as barren as the Sahara desert, and of which it seemed to be a part. But except for acknowledgments and forms to be filled in no one was eager to accept my services.

Impatient and restless, my exchequer – like the Benguella’ Railway’s – running dry, I turned my thoughts to emigration. The Canadian Office, with its windows decked out with brightly coloured posters depicting immense rich wheat lands, and with displays of the wonderful products of that country, attracted me. I had friends in Canada and to that seemingly happy and prosperous land I decided to go. It was to be my fifth stepping stone.

Without delay I booked a passage and crossed the Atlantic to St. Johns, a voyage that took thirteen days instead of eight owing to a terrific storm, and fog.

It was good to hear the jerky, jovial laugh of my friend Teddy when I stepped out of the train at Montreal. We had much to exchange in the way of experiences over the years which had passed since we parted at Cape Town. But, it was disappointing to learn that the prospects of employment were poor. It was the wrong time of the year for most things particularly railways, which close down all construction when the country became snow-bound, as it now was. Job-hunting became / my daily occupation, but I filled in many hours sketching, for I had never allowed my taste for the art to decline. I remember taking a pen-and-ink cartoon to a newspaper editor. It depicted death and famine stalking the land, and had something to do with the city’s devastating typhoid epidemic. I was
invited to submit sketches on any other subject. From Winnipeg came a letter which raised my hopes of immediate employment there.

Then occurred one of those things which shapes one’s destiny – ‘a tide in the affairs of man’ as the Bard has it. A cable from home had found its way to me. The Crown Agents wanted me for the Nigerian Railway, and it would pay me £100 a year more than had been offered the previous year when I was in Angola. Clearly my stock had gone up, and Africa was determined to lure me back. My heart thumped with excitement.

‘There you are, Teddie’ I said to my friend, handing him the cablegram ‘that settles it – Africa wants me – Canada declines to recognize the budding engineer. This is the second time Nigeria has called me.’

‘My dear Screamer’ he always called me that ‘it sounds swell, but West Africa, – gee! – isn’t that the White Man’s grave, and didn’t you almost peg out in Angola!’

‘True, pard’ I responded ‘but what has this benighted country to offer? Look at the ghastly tragedies of the snow reported in your newsrags; look at your own darned city / here, reeking with typhoid on account of your filthy water – hospitals overcrowded, maladministration, bribery and corruption. No! to be with the devil I know I’m off, if they’ll hold the job, and I’ll cable right now.’

No sooner said than done. I informed the Crown Agents I could be in London on a certain date, and in two days time confirmation of the appointment was in my hands. But being in Canada I was filled with an irrepressible desire to see more of the country. I set out west by train to Winnipeg, there to renew acquaintance with friends I had not seen for eight yours. They had a job of some sort waiting for me-I forget what it was – but when I informed them I was now en route for West Africa and that this was but a brief visit to say ‘how d’ye do’, and to spin a few yarns about old times, they thought I was crazy.

On New Year’s day 1910 I was skating on the ice-bound Assiniboinie river in a temperature 40 degrees below zero. As though I were not already far enough West I traveled 150 miles to Minnedosa to stay with some friends on a farm. My time schedule was now cut to its limit. I hastened back to catch the ‘Adriatic’ sailing from New York hoping to fetch up in London seven days later. It allowed me three days to spend exploring the great city of sky-scrapers, and an opportunity of seeing Enrico Caruso perform in ‘La Boheme’ at the Manhattan Opera House. /

The ‘Adriatic’ failed to make the necessary pace. I was much overdue when I showed up at the Crown Agents, who informed me they were about to make other arrangements as they had given up all hope of seeing me. A boat was leaving Liverpool for West Africa in four days time. They demurred when I suggested that the time was somewhat short – with a Saturday and Sunday intervening – to allow me to procure stores and suitable tropical equipment. But the mat-
ter having been represented as one of extreme urgency I waived my plea for an extension of time, signed a document which showed that I agreed to serve as assistant engineer in Northern Nigeria on the Baro-Kano railway construction, for a period of twelve months. These periods, I was to learn, were called 'tours'. Then I passed a medical test, after which I set about trying to collect a tropical outfit. I had a day and a half to do it in.

I had had a hectic round of travelling on land and water for eight weeks, and had covered something like 10,000 miles in that time – a hustle, which, I thought, many an ubiquitous Yankee globe-trotter might have been proud of. It was an experience full of incident, and one which I had thoroughly enjoyed. It proved to be my sixth and final step to what was destined to be the country of my labours for almost nineteen years.

TO NIGERIA

The 'Landana', Elder Dempster's boat, which I found waiting for its human cargo of west African Coasters at the O Prince's Landing Stage, Liverpool, was a vessel of about 4,000 tons, a drab and dreamy-looking thing compared with some of the craft I had travelled on. It steamed off in frosty weather, the decks slippery with ice. My fellow-passengers, numbering about 80, were all men, for the West Coast at this time was a place where few white women cared to venture. We passed the gigantic 'Lusitania' riding the waves in glorious splendour, a ship destined to meet a tragic ending some years later. Heavy seas tossed and battered us the whole way to Las Palmas it was a relief to land and stretch our legs at this sunny spot, and to do a round of the sights – my second visit.

About half the passengers were Government officials, the other half being composed, for the most part, of the trading element, the whole a fairly tough lot. There were some gay and restless sparks who could never be happy unless devising and carrying out pranks of one kind or another. A Frenchman was the victim of one of these. He was middle-aged, pompous, and self-assertive, was a much travelled man of commerce who talked pretty big about his travels. He possessed an enormous trunk, which being too large to fit in his cabin had found a prominent resting place in the alley serving the sleeping cabins. Almost every inch of it was plastered with / Labels from every quarter of the globe. They were neatly arranged, no one label overlapping the other, and the resulting pattern with its varied colour producing an effect impressive though somewhat bizarre. Monsieur could be seen at betimes proudly expatiating upon the history attached to each label to anyone he could waylay, in something of the manner in which an ardent philatelist would lovingly dilate upon a set of rare stamp specimens. This was too much for two my two cabin mates who succeeded in drawing me in as an accomplice in what was to follow. From illustrated periodicals and magazines we
cut out many weird and grotesque advertisements upon which we smeared paste. Then by stealthy manoeuvering – two of us keeping ‘nix’ as school boys do – we made that trunk glory in nothing in nothing but the wares and manufactures of the day. Frencie stormed when he discovered what had happened, called the Captain and held him to account for the ‘outrage’. But inquiries failed to bring to book the culprits, so well and skilfully had the operation been carried out. The trunk was removed to a safer place where its irate owner, we heard, spent many weary hours in trying to restore it to its former glory.

The ‘Kandana’ duly arrived off Lagos and stood there the whole day in muggy heat. It could not enter the harbour owing to the shallowness at the entrance, the draught limit being only 13 feet, our ship drawing about 19 feet. In consequence Lagos passengers and light cargo had to be transferred to small shallow-draught steamers in the open roadstead. All heavy / cargo from ocean – going ships had at this time to be taken to Forcados – some 150 miles to the east – and there transhipped into branch boats for return to Lagos. The limitations of the Lagos Bar imposed a severe handicap upon the great scheme of development for making Lagos a harbour capable of accommodating large ships, and for opening up the hinterland. Two long parallel mole’s were now being constructed at the harbour entrance to from a navigable channel in which dredgers could work to increase the depth of water. This work was dependent upon the railway being able to deliver stone, which could not be obtained at any point nearer than 60 miles on the railway from Lagos.

A brief reference to the history of the Lagos Railway may now be made. The idea of projecting a railway into the interior emanated, from private interests when, between 1879 and 1891 concessions were sought from the Colonial Office. The essential features of all schemes for railway building, however, was a guarantee of interest by the Government on the construction cost. Lagos Colony, not feeling justified in guaranteeing interest on the exhorbitant sums involved, rejected such schemes, and finally, itself, decided to undertake the development of the hinterland by means of a railway. Construction began in March 1896, concurrently with the commencement of the Sierra Leone railway, these being the first railways laid in the British Colonies on the West Coast of Africa. The rate of progress was slow owing to the numerous difficulties encountered, and construction was interrupted in 1897 and 1898 by native disturbances in the interior. The lethal nature of / the country militated against any rapid advancement. It is recorded that between November 1895 and February 1900 of seven officers holding the position of chief Resident Engineer, three died and two were invalided, while one resigned on account of ill-health. The casualty rate was high, and in consequence the number of Europeans engaged on the work was necessarily large. In 1903 the average number of appointments existing was 57 while the number of persons required to fill these was 219 or an average of 3.84
per appointment. Construction was still in progress and at this stage the line had advanced 272 miles in a northwardly direction towards Jebba on the Niger river.

This digression serves the purpose of connecting up the events that follow, and which lie within the purview of my personal experiences and observations. It enables me to complete a picture of pioneering days on railway construction in Nigeria, and of the growth from birth of two separate organisations which ultimately became welded into one great transport machine – the Nigerian Railway.

Lagos had taken the majority of our passengers, and those now crossing the Bight of Benin were few in number. We were bound for Forcados. This port, on the Forcados river, lay hidden away in the delta of the Niger amongst a labyrinth of creeks and waterways. The land is low-lying and covered thickly with mangrove trees, the evergrowing mangrove that shoots out its tentacles, dropping them to grip and take root in the water bed, which gradually builds up with silt and mud to form new land, and land that is slimy and treacherous. Along the 150 miles stretch of delta coastline are five or six main water channels connecting with the Niger river, but the Forcados entrance was the best and most accessible, and its depth allowed ships of the ‘Landana’ class to negotiate – but, only just – the passage to Forcados. This channel extend some way out to sea and its confines are marked with buoys. Numerous sand bars lie along its course so that steamers have to steer their way slowly and cautiously. Sometimes at low tide steamers get firmly emedded on these bars and have to wait for a rising tide to force themselves off. When we struck two of these sand bars the whole ship shuddered, but it managed to ride clear. These ships, I was told, were specially bottomed to withstand such shocks.

At length we anchored after a voyage that had taken us eighteen days from England. I can well remember the atmospheric conditions of that early morning as we hove off the port, the sweltering, heavy, overpowering heat, and could now understand what Kipling meant when he wrote about the dawn coming up like thunder.

Besides being a trade and Government Marine depot Forcados was then a tranship port, where cargo and passengers were transferred to smaller steamers which connect with important trade centres lying in the deltaic region, such as Warri and Sapele. It is a natural harbour and one of the best landlocked / harbours on the West Coast, covering an area of about four square miles, and providing a minimum depth of thirty feet.

Our baggage was transshipped to a flat-bottomed stern-wheeler, the ‘Empire’, a craft of about 130 feet in length. My destination was Baro, 407 miles up the river, and the headquarters of the railway. Barring accidents or other unforeseen circumstances I expected to get there in eight days.

I found I was inadequately equipped for the journey as the good ship ‘Empire’ did not cater for its passengers, everyone having to fend for himself. One of my
sorely needed half dozen cases was missing. My companions – six Government officials and a German traveler – appeared to be amply provided for such a contingency. Some had brought out with them from England as many as sixty cases of stores and provisions, each weighing fifty to sixty pounds, because, as they informed me, it was difficult to procure supplies up north, especially when living in a bush station. They had mortgaged a few months of their future salaries to them to do this. It was said of the Europeans in Nigeria that they went home all money and no clothes and returned ‘all clothes and no money’. My position at this stage was a very scanty wardrobe and little cash.

I sought out the Niger Company, and having explained my quandary had little trouble in obtaining sufficient cutlery, crockery, and foodstuffs to see me through to Baro. The goods were supplied on ‘tick’, but a Government official, I was to learn, was considered a good mark to sue in the event of trouble over an account, and as the Niger Company had its branches and ramifications all over the country an account could be passed from one branch to another; thus, a defaulter could not easily get away with it.

My next problem lay in finding suitable servants. They were there in abundance – a motley crowd; boys who had been paid off by their masters returning to England, and who had been dumped at Forcados, where they eked out a somewhat precarious existence, living in the hope of employment when the next home mail-boat arrived. I was besieged on all sides, when ‘chits’ testifying to character and ability were thrust into my face. Some of these were anything but flattering, but they were just as eagerly and cheerfully presented. I selected one who alleged to be a cook and who agreed to come with me for twenty-five shillings per month plus two shillings ‘chop’ money. When interrogated as to what he could do in the culinary line he responded that he could cook ‘any dam t’ling’. I then engaged a steward boy who would attend to my other bodily wants for the sum of fifteen shillings per month plus two shillings ‘chop’ money. When interrogated as to what he could do in the culinary line he responded that he could cook ‘any dam t’ling’. I then engaged a steward boy who would attend to my other bodily wants for the sum of fifteen shillings per month plus two shillings ‘chop’ money. When interrogated as to what he could do in the culinary line he responded that he could cook ‘any dam t’ling’.

Forcados had the reputation of being one of the wettest spots on the Coast. I was informed that seldom a day passed without a downpour, that the average annual rainfall was 150 inches, and that as much as 42 inches had been recorded in the month of August. On this Sunday the maximum temperature was 93 degrees and minimum 83 degrees in the shade. I could not help contrasting the damp, sweltering, sticky heat with what I had experienced only a few weeks back, when at Winnipeg I was frostbitten in a forty – degree below zero temperature.

At noon we were ready to go. The boat was loaded to its utmost capacity; and from my position on the upper deck to one that the lower deck stood only a foot or so above the water. This deck contained a heterogeneous rabble of
natives, men, women, and children, with all their their usual accompaniments of travel, but mostly foodstuffs and cooking utensils. On the upper deck we Europeans spread ourselves out with all the equipment required for the journey. In command of the whole outfit was a black skipper. The whole community of Forcados, which consisted of a handful of European traders, a few Government men and hundreds of natives, turned out to witness our departure. As the moorings were cast off the air became filled with a perfect pandemonium of yelling, shouting and excited babbling, but it was all in glee and the utmost merriment. / The upper deck started immediately to sort out its goods and chattels; Masters conferred with their cooks, and steward boys rummaged about the baggage for such indispensable articles as conduced to provide comfort and well-being. Amongst my belongings was a large green Willesden waterproof kit bag, a free issue, with which the Crown Agents had provided me. Everything it contained was designed either to fold or close up – a bed with cork mattress and mosquito net complete, blankets, table, chair, and bath. There was also a box containing a pump filter and an oblong rectangular sort of hurricane lamp, styled a ‘Lord’s lantern’ guaranteed to keep alight against ‘all the winds that blow’. 

Our progress was Leisurely and we covered only 37 miles that day, dropping anchor at sundown off the shore of a tiny village called Frukama. It was not the practice to travel at night owing to the task of getting landed on a sandbank or striking a ‘snag’, which term usually denoted a floating tree. Our meals, to start off with, were of a somewhat scratch character. We issued tins of this and that to our cooks, who took them below and in some extraordinary manner a satisfying three – course dinner was served up. We ‘chopped’ in a kind of community style, and whatever was short in one larder would be supplied from another. In the evenings we lounged in our deck – chairs to indulge in reminiscences. It was, indeed, very interesting to listen to the varied experiences and anecdotes of my fellow – travellers, and to learn something about the great and mysterious country into which I was headed. I, being the only railwayman aboard, was able to throw to the general pool a spotlight of experiences from another angle. Someone produced a gramophone which helped to enliven moments which otherwise might have proved monotonous. I recollect one still, fine night when a particular record was played. We lay out some distance from the river bank opposite a village. The item played was a laughing song in which the singer ended up the refrain in rollicking, hilarious bursts of laughter. It was amusing enough for us, but when the performance was carried over the water through the still night air to the native village it became highly infectious for the inhabitants sent us back yells and roars of hearty laughter in imitation.

We chugged along until we entered the Niger river proper near the village of Asseh, having covered 110 miles. At this point the river is about half a mile in width, and as we progressed it broadened in places where it must have been 11/2
to 2 miles across. I thought of the ‘lordly Niger’ as Longfellow expressed it when about the year 1842 he wrote ‘The Slave’s Dream’. ‘Till he saw the roofs of Caffre huts … and the ocean rose to view’. Incidentally, the outlet of the river was discovered only in 1830 by Richard Lander. Till then it had remained a mystery. / The same Niger river and the same poem got my daughter into trouble when she was about six or seven years of age. Her school teacher taught her to pronounce the word ‘Niger’ to rhyme with ‘Tiger’. When I heard this I was surprised. In school the next day my daughter in reciting the poem boldly put in the correct pronunciation and was reproved. She persisted that that was the way her daddy pronounced it, and as he had actually been on the river he should know. Notwithstanding her persistence, which created a scene ending in tears, Niger as in Tiger it had to remain.

Pushing ahead in easy stages we traveled about fifty miles each day, stopping at villages en route to take on or discharge passengers and freight, and to refuel – a lengthy operation. The ‘Empire’ was run on wood, of which stacks lay at convenient in-travels along the route. Soundings were taken every now and again, and although our skipper must have known the intricacies of the river pretty well he could not always be certain of a clear passage, because new sandbanks had the habit of forming almost overnight at unexpected places. The river was fairly low, but not at its lowest. I was told that when in full spate during the rains from the north it was navigable to Baro for steamers of 1500 to 2000 tons for a few months, and that this period was availed of by the railway for bringing up as much construction material as could be carried in the time.

We had got well out of the low – lying swampy palm – oil / country when we touched at Onitsha, said to have had the largest trading station on the Niger. Apart from its trading activities Onitsha was noted for its Catholic mission in charge of, Father Shannon, who was said to have achieved as much, or more, fame for the teaching of useful trades to his native flock as for inculcating knowledge of a spiritual nature.

The sixth day got us to Idah, important only in that it was the boundary point between Southern and Northern Nigeria, and here some harmless customs formalities were gone through. We now emerged from the thick somber lining of mangrove and forest jungle to enter more open country. Vegetation became less evident and gave place to undulating plains on which hillocks of rock and red-stone reared themselves, where the distance mountain ranges added a picturesque note to the landscape. We could see farms of yams and guinea corn’ and cattle, goats and sheep, while all the time alongside the river banks plied canoes laden with produce and livestock. The river course became more intricate for navigation; dangerous-looking outcrops of granite rock protruded and gave indication that underwater rock lay at no great depth.
The following day we moored alongside the beach at the important trading town of Lokoja, 350 miles from our starting point. Lokoja, until about ten years previously, had been the administrative centre of the Northern Government; before that, Royal Niger Company, under Royal charter, was responsible for law and order and the general administration or affairs in the territories which ultimately became designated as Northern Nigeria. In 1900 the British Government revoked the charter and acquired this immense and valuable property for the paltry sum of £865,000, reserving to the Niger Company certain trading rights and royalties in minerals. Lokoja is situated at the junction of the Benue river with the Niger, which at this point is very wide. The Benue itself is a river of some magnitude and has its source in the Cameroons, some 700 miles away; it is wide and deep enough, according to the season of the year, for the navigation of boats of light draught for some considerable length. The usual method of transporting Europeans was by barges constructed of steel, in length forty to fifty feet, They were propelled by long light poles wielded by natives, in the shallows near the shore, and by paddles in midstream.

Some of our party left us here, bound for eastern stations, To while away waiting moments we called upon some of the local officials and were entertained to drinks and ‘smallchop’ as well as the latest local gossip. This diversion enabled me to add to my knowledge of who was who in the country. I heard of men who had gone home, – some of them invalided –, of some who had died, of scrapping with the natives across the river in pagan country, of mismanagement in the affair of Government and / private concerns, of the lack of Public funds, of the miserable conditions under which Europeans were condemned to live, of Government policy concerning the two rival Nigerias, Northern and Southern, and so on. It was all very interesting and entertaining.

The cantonment was nicely and uniformly laid out the one road well-made and lined with trees, mostly lime. The bungalows were set in spacious compounds, each resting on piles raised about six to eight feet off the ground. The gardens contained many variegated shrubs and trees, amongst which went acacias, oleanders and frangipani. How more fortunately placed were these officials, I thought, than the hemmed-in, washed-out, wear-looking traders of the Niger Delta stations. The 94 degrees temperature at night cooled down to 68, the lowest mark I had experienced on the river.

We left Lokoja next morning, on the last stage, and during the afternoon of the following day, Baro hill hove in sight. /
BARO-KANO RAILWAY CONSTRUCTION

From the deck of the good stern – wheeler 'Empire' there was no mistaking the kind of place on which I was about to set foot. It was Lobito Bay all over again. There were the puny shunting engines puffing and snorting and shrieking, pulling and pushing wagons, empty and laden. There were the tracks and sidings, the stacks of rails, heaps of steel sleepers sand piles of other material, most of it lying higgledy – piggedly and mixed up with great timber baulks and steel bridge girders. There were the same types of sheds and stores buildings and all the machinery and equipment that give evidence of some big railway construction project.

We drew in at four o clock and tied up to a timber wharf. Baro hill lay to my right and ran down at a sharp angle to the water edge. It was about 400 feet in height, and being composed of laterite it looked terra cotta in colour. The hill extended inland and curved around to my left, he whole constituting a semi – circle, within which, on the flat, lay the native village. Before the railway came Baro was a place of little importance except as a ferry crossing for caravans from the north to Lokoja and other southern towns. The river crossing here stretched fully one mile across. Pathways zig-zagged up the near – by hill and here and there a bungalow fitted of places where to large chunks of hillside had been hewn or blasted out to provide sufficient level ground.

It was in one of these bungalows I was accommodated / for a short period before moving to quarters on the hill-top, where the ground was spacious and flat and admirably suited for the quarters and offices of administration staff. Moreover, it was comparatively free from the attentions of mosquitoes and sand-flies which pervaded the lower level. Most of the buildings were constructed of laterite stone.

And now I was to meet the Director of the railway, John Eaglesome, to whom I had written, before I left for Canada, on the prospects of employment in Nigeria. I was appointed, temporarily, as his Personal Assistant, in which capacity I was to become acquainted with much of the administrative workings of the railway.

It was evident that the Baro-Kano Railway was in charge of a most capable and highly-skilled administrator – engineer in the person of John Eaglesome. He was referred to far and wide as John E., a brevity denoting popularity and distinction. To say more about this remarkable man makes it necessary for me to hark back to earlier days, to fill in, however sketchy it may be, a background for the presentation of characters and events associated with the inception of the Northern Nigeria railway project.

Here was as vast territory of about 275,000 square / miles with a population estimated to number nine million souls. They were composed of Hausa,
Filani and Nupe races, and numerous pagan tribes. The country was divided into twelve Emirates or States, each one ruled by an Emir. From a fairly high degree of civilization extending back some centuries they had lapsed into an era of barbarism and constantly made war, one with another. Lands were devastated and desolated. Rapine and ruin were the order of the day. Captives were forced to slavery, human sacrifices and other horrors prevailed. It was no fit place for any peace-loving person, to be found wandering in, with the exception, perhaps, of a few areas close to the Niger river where Europeans could conduct trade in comparative safety. The Niger Company in order to extend its trade obtained its Royal Charter in 1886, and in this way, under the aegis of the British Government was enabled to control and employ a constabulary under Colonel Lugard, for the development and protection of its interests in the hinterland.

It was about this time (1897) that European powers in Africa were casting envious eyes on native countries that remained free from foreign domination. The northern territories of Nigeria seemed a good mark. Already the French from the north and west were nosing about the country as were also the Germans from the east with the obvious intention of establishing spheres of influence at first, to be followed, as a natural sequence, by complete annexation. A clash with the French seemed imminent but was averted. The British Government, realising that the powers and authority of the Niger Company were inadequate and spurred to action by the far-seeing and visionary Lugard in a situation complex and dangerous, abrogated the charter. It was enabled thereby diplomacy, to settle all contentious problems with its two neighbouring Powers.

The military occupation of the country and the establishment of an administrative machine followed in 1900. It was not achieved without fighting, as a number of the Emirs, fearing their power would vanish, and with it the life of rapine and plunder which they so dearly loved, put up a show of resistance. It was, however, a half-hearted effort and the process of establishing law and order gradually assumed shape. By 1905 the newly acquired territory had effectively settled down to the peaceful pursuits of trade and industry. The Emirs, on the whole, were content, and provided they showed good – will to the new order of things and abolished all evil and undesirable practices, as we understand them, were allowed to retain control of their provinces under the guidance of political officers. When the natural suspicions of the native mind were overcome the people realised and appreciated the significance of the word 'Protectorate', that under the ruling monarch of Great Britain they would be protected, guided and advised, that their welfare be promoted, and that in the fulness of time the resources of their lands would bring them prosperity and contentment. The laws – unless they were deleterious – customs, religion and language of the country were not interfered with; rather, were they upheld. It appeared to be government for the people through the people, and it was called ‘indirect administration’. It
was a policy laid down by Sir Frederick Lugard, who had been appointed the first High Commissioner for Northern Nigeria in 1900.

To consolidate this vast acquisition of territory and to promote its economic development became an urgent and pressing problem, for distances from north to south and east to west ran into hundreds of miles. No roads were available and transport of commodities was only possible by head-load along native bushpaths, except in the far north where donkeys, bullocks, and camels could live and operate. French policy, now that its power was ousted from the Protectorate, sought to attract the trade of the western provinces by planning a railway in Dahomey from the coast, to run close to the Nigeria boundary, while in the north caravans of hides, skins, and other commodities crossed into French Soudan to wend their way to Morocco, returning with the wares and produce of other countries.

Lugard urged the immediate construction of a light railway of 2’ 6’ gauge, built on pioneer lines, not alone on the grounds of military expediency but as well for the effective political administration and development of the country’s potential trade / resources. The Southern Nigeria Government then became interested for it looked forward to an amalgamation of the two territories in the no distant future. It strenuously opposed the proposal for a 400 – mile narrow – gauge railway in the north, as it had, itself, constructed, and was extending a line of the wider 3’ 6’ gauge to connect with a future northern system. There followed the battle of the gauges, each side advancing arguments in support of its own particular type of railway. Lugard had (in 1902) established his administrative centre at Zungeru and had caused to be constructed a 2’ 6’ gauge line of 21 1/2 miles from the Kaduna river (a branch of the Niger) to his new capital. He seems to have been imbued with the idea that a railway (it was actually termed a tramway) of 400 miles of this type was equally well adapted to the development of the immense tract of territory under his administration.

Fortunately the matter resolved itself when in 1907 Sir Percy Girouard succeeded Lugard as High Commissioner, Girouard favoured ther wider gauge and it was then only a matter of obtaining the sanction of the Imperial Government to put the work in hand. Plans for a great central railway highway were at once formulated. Girouard was a soldier of the Royal Engineers who had achieved considerable distinction in India, Egypt, and South Africa in Railway work, perhaps the most notable being the rapid construction of the line in the Dongola expedition under Kitchener during the advance on Khartoum. /

The railway would have its terminus at Kano which was by far the most important and most populated trade centre in the Protectorate. Baro was to be the starting point. Its depth of water between July and September would enable steamers of six to twelve feet draught to bring material from Forcados, Thus, railway and river would provide the main outlet artery for northern traffic until such time as a junction with the southern line could be effected.
Girouard intended to construct the line according to his own method and ideas and in this he must have had in mind his achievement in the Soudan. The track would be of the pioneer type, pure and simple, to be built quickly and cheaply without any fancy trimmings or expensive buildings or other works, and to be or sufficient use to meet the needs of the moment and the immediate future. Posterity could strengthen the whole structure if and when conditions required it. The cost of constructing and equipping the line was estimated at £1,230,000 and the wealthy Southern Nigeria neighbour was putting up the money.

A location survey was started in 1907, and hard on its heels came the construction brigade. Girouard wasted no time. He scoured the various Government departments for men who could turn their hands to survey work and the supervision of construction / gangs. Men who could be spared from the ranks of the military, the Public Works, the Political, and other departments, all keen to participate in this great undertaking. The Public Works department had as its head John Eaglesome, whose reputation as an engineer on railway construction in India stood very high. He was appointed as Director of Railways and Public Works, an appointment which was at once popular, and fully justified as future events proved. Other local appointments followed and although it was, in its general make up, a scratch team it got things going until the more highly skilled and technical railway officers arrived. Girouard being an R.E. Officer prevailed upon the War Office to allow a contingent of Sappers to come out for laying the track. It was, I think, an innovation in Colonial railway building and the War Office was only to pleased at the opportunity it provided the Sappers for gaining practical experience.

It may be said that the Baro-Kano railway construction formally started on January 7 1908 with the cutting of the first sod by the Emir of Bida at an inaugural ceremony, at which His Excellency the High Commissioner of Northern Nigeria attended. Labour, for the most part was raw and unskilled, and consisted of about 1,200 Hausa, Yorubas, and upes. Political officers exercised control in the native interest through village chiefs and organised the recruitment of labour. The initial work was hampered by a deficiency in tools, so that the / use of native hoes and native – made baskets for carrying earth was resorted to, as well as all the tinned basins that could be purchased through the trading firms. I had never heard of or seen an African native using a wheelbarrow. A story was told that they were tried once, but the natives filled them and placed them upon their heads.

Baro bustled into activity – a race against time – preparing for the reception of material coming out from England. Stacking ground had to be prepared, sidings laid, jetties constructed, quarters and stores erected. Only three months (July to September) – when the river was high – would be available for dis-
charging the boats (they were up to 1000 tons capacity) coming from Forcados, though lighter craft could be navigated from October to January.

In July the boats began to arrive, but one suffered disaster when it struck a rock below Lokoja and much of the sorely needed earthwork tools, rails and sleepers were lost. Discharging at Baro continued feverishly day and night, from 6 a.m. to 12 midnight in two shifts, with half – days on Saturdays and Sundays, with scarcely a hitch. Each boat when discharged hastened back to Forcados for more cargo and was back again in an average of 17 days.

It was a triumph of organisation. Thirty thousand tons of material were landed in Baro by the end of November – double the quantity it was estimated could be transported and handled in the time. Earthworks for the new line were completed for ninety miles. Two months later fifty miles of track had been laid.

It was apparent that John Eaglesome with his magnetic personality had gathered about him a most enthusiastic body of workers, from the lowest to the highest in rank, all animated with the same resolve – to reach the objective up to schedule and incidentally to show the Southerners a tip or two. The latter were projecting a line northwards in what seemed to be a leisurely, though apparently solid, manner. They were said to deride the methods employed by the Northerners whose avowed determination to reach Kano by rail in three years they regarded as bordering on the fantastic.

John Eaglesome, made a point of knowing everyone of his staff, and seeing that everyone in the railway knew everyone else, whether in the railway or out of it, and so, at the pleasant social functions in his house, at which his distinguished – looking wife presided charmingly as hostess, one would meet people from every aspect of Nigerian life. It was good policy, for in many ways men outside the railway became bound up in its working and the personal contact went a long way in bringing about mutual cooperation. In his selection of men for particular jobs John E’s judgment was sound and unfailing. There were no square pegs in round holes. /

On the 1st April 1910 the section of line, Baro to Minna, 111 miles, was thrown open to traffic for the conveyance of passengers and goods, with rates and fares fixed in the approved manner as pertaining to railways generally. A permanent staff had been appointed and amongst the list of engineers selected I found my name. I concluded, therefore, that in the short space of time I had put in at headquarters I had created a sufficient impression of efficiency as to warrant my selection. I was not, however, to be employed on open lines work but was seconded for construction. /
BARO-KANO RAILWAY CONSTRUCTION

Having equipped myself at the local canteen with boxes of provisions and other necessities for life in the bush I travelled to Minna by the railway. The first part of the journey was through low-lying land with occasional forest belts, after which we ran into undulating and well-wooded country, a range of barren hills. Patches of cultivation, but little native life, was to be seen, except for gangs of labour putting finishing touches to the track and station buildings. The latter in accord with policy, were of the simplest kind – a corrugated iron hut about twelve by eight feet, for the station office, and a few small round bush huts for the staff, which was composed of Southern natives and West Indians, specially imported for the work.

Minna is 800-feet above sea level and was nothing until the railway came. It was to become the junction of the line creeping up from Southern Nigeria and from it a line was shooting out to the west, its immediate object being to connect with Zungeru, the capital, which lay 38 miles away.

The railway station stood in a semi-amphitheatre of hills lying to the east.

On the northern spur, below which the railway skirted were the quarters of the European staff, a distance of about two miles from the station. This area was served by a newly constructed laterite road where midway stood a fine double-storied block of offices. No European walked any great distance for, as at Baro, hammocks carried by four natives were provided so as to conserve one’s bodily energy. I reported to the Engineer in charge, Mr Bland, a tall sparsely-built Canadian and received my final instructions. Bland was only 31 and was John Eaglesome’s right-hand man; he had served on the Canadian and South African railways and had seen service in Strathcona’s Scouts during the South African war.

It took me four days to travel the 67 miles to my camp at the Kugo river, for with the commencement of the rains the floods had played havoc with parts of the line; swollen streams and rivers carried away embankments, and repair gangs were busily engaged repairing the damage. About half-way through the journey I met Bostock, a district engineer, whom I had known at Lobito Bay where he had engaged on location survey the John Norton Griffiths’ regime. He had discarded the flowing moustache and pointed beard of black which had graced his features and made him look like one of the cavaliers of Queen Elizabeth’s day during his Angolan sojourn. It was pleasant recalling the events of those days.

At Kano I relieved Lloyd, a public works man who had been seconded for railway work and was now returning to his former occupation. Apparently there was a dearth Political officers and Lloyd, in addition to his railway responsibility, was acting as Assistant Resident. The duties of that office for which I would receive an emolument of £4 per month were handed over to me.
The political work was bound up principally with the recruitment of railway labour, which was obtained through the medium of the chiefs, or Serikis, of the province, though the dispensing of justice formed a not inconsiderable portion of the duties. It was primitive for there existed no building of dignity in which ‘court’ proceedings could be conducted. The shaded porch of the verandah of my bush house provided as imposing a place as any other, and here, seated at a wooden folding-pattern table, I would preside, while outside would be assembled all the characters usually associated with a judicial contest, including dogarai (native police) in their voluminous red gowns and turbans. The proceedings were conducted in an atmosphere of solemnity, for the native takes matters of law very seriously. The rulings and decisions of the white man were accepted without a murmur, no sign of disapproval being evident. Cases were for the most part, those relating to petty crime and domestic differences as between husband and wife and known as ‘mammy palaver’. Those of a more serious nature and outside my powers of jurisdiction were transferred by me to the ‘big judgie’ (Resident) at Zaria. I was regarded as the ‘little judgie’. / [...]
The object of this paper is to describe the type of railway which in my opinion is best adapted for opening up territory to trade in the shortest time and at the least possible cost, but which shall at the same time possess a large carrying capacity. It is most important in the interests of any undeveloped Colony that the cost per mile of railway communication should be reduced to the lowest figure compatible with efficiency and sufficient carrying capacity. I want to show you why a pioneer railway should be cheap, and some of the results that follow cheapness.

Let us take the theoretical case of the construction of a railway in a new country where all the traffic is brought down to a port and is an even quantity per mile, and therefore proportional to the length built of the railway. Take a fixed sum of capital, say £600,000; what lengths of railway can be built for this? At £3,000 per mile you will get 200 miles; at £6,000, 100 miles; at £9,000, only 66.6 miles. As you increase your length you increase your traffic area. Take it that each mile produces the rather high figure of 600 tons per annum. The line costing £9,000 per mile brings to the port a traffic of 39,960 tons per annum; that costing £6,000 per mile obtains 60,000 tons; and the line costing £3,000 per mile obtains 120,000 tons per annum. The ton-mileage carried under these theoretical conditions illustrates still more clearly the value of increasing the length of a railway and of adding to its traffic catchment area. The ton-miles – that is, the number of tons carried one mile – are respectively, for each length of railway, 1,350,000, 3,030,000, and 12,060,000 ton-miles.

It is necessary to remember that the traffic to be carried in any district through which a railway is about to be constructed is the same per mile of line, whether you put down an expensive broad gauge line or a cheap narrow gauge. You must clearly understand, therefore, that if you select an expensive type of railway to
open up undeveloped country you must be prepared to accept, permanently, rail charges very considerably higher, and as a consequence the slower development of the country and its resources. / Let us assume that Her Majesty’s principal Secretary of State for the Colonies is prepared, with the object of raising capital on the cheapest terms, to offer an Imperial guarantee of say 3 per cent. on a fixed capital sum of £600,000. If the railway is to be self-supporting, it is obvious that while the £9,000 per mile line has to pay working expenses, be maintained, and pay the guaranteed interest amounting to £19,500 yearly out of a traffic of 39,960 tons brought to the port, the £3,000 per mile line trebles the security on account of its 120,000 tons of traffic. It is not the capital expended on a railway which constitutes security, but the amount of its traffic in relation to capital cost. The quota contributed per ton to the guaranteed interest of £19,500 in the case of the £9,000 per mile line is 9s. 9d., equal to 3.47d. per ton-mile; in the second case to 6s. 6d., equal to 1.54d. per ton-mile; and in the case of the £3,000 line to only 3s. 3d., equal to 0.39d. per ton-mile.

Finally, the longer the length of line you get for your money, the poorer the character of country you can enter upon and still obtain profitable results. If it be possible to halve the estimated cost per mile of any projected line, you will get either twice the traffic area for the same money, or, if the line be restricted to the same length, the profits which it may earn will be, per cent. of capital cost, twice that of a line of double the cost, and consequently the prospects of a financial success are made much more certain. What is wanted for Colonial development is cheap railway communication and plenty of it; and if with a proper traffic capacity you can get two lines for the cost of one making a good return on their capital, I think you will agree that railway construction and extension will be much more rapid in the future than it has been in the past.

The substantiality of permanent way does not consist in the adoption of any particular number of lbs. per yard of rail, but solely on the weight per yard of rail having a proper relation to the maximum weight per axle of the rolling stock to be placed upon it. A rail of 25 lbs. per yard may be as permanent and ‘substantial’ as one of 75 lbs., provided that the maximum axle-load bears a proper relation to it.

The decision to be arrived at is, what weight of axle-load is the most desirable, having regard, first, to the character and amount of the traffic to be carried, and, secondly, having regard to the cost per mile of permanent way which the general circumstances of the country, and the capital available together indicate as a necessary limit?

For the Barsi light railway in India, I have adopted a maximum / uniform axle-load of 5 tons on locomotives, wagons, and carriages alike, and the line has been laid with 35-lb. rails to ensure a long life under an extremely heavy traffic.
Both as regards the bulk and weight-carrying capacity of its vehicles, a maximum axle-load of 5 tons will meet all the requirements of a light railway for the Colonies.

On the selection of gauge even more depends than on that of axle-load. The narrower the gauge the smaller the radius of curve around which a train can run without undue resistance and friction. The small radius of the curves of the narrowest gauges confers upon them immense advantages in locating their alignment in rough country. Flexibility of alignment permits a railway of narrow gauge to wind in and out so as to avoid deep cuttings, tunnels, heavy embankments, bridging, and the severance of valuable property. In flat, level country, the difference in favour of a narrow gauge is at its minimum, but the more difficult the country the greater becomes the difference in cost per mile.

It is possible to build broader gauges with curves of very small radius, and that trains will run safely round them, but if this is done train loads must be greatly reduced.

The principle which underlies the question of gauge, and should determine its selection, is, that a railway, like any other machine, is economical only when working within a reasonable measure of its full power. If you adopt a gauge which at the outset is much above the traffic and means of the country to be opened up, you invite financial disaster, and your railways, instead of being a source of profit, may become a burden upon the revenues of the Colony.

The ultimate traffic capacity of a narrow gauge railway, starting with light rails and a small axle-load, can be largely augmented to meet a great increase in traffic by increasing the number of crossing stations, and, when renewal of rails becomes necessary, by laying a much heavier section to double the axle-load, thereby greatly increasing the power of engines. The capacity can be again more than doubled by doubling the line. It is axle-load and not gauge which is the greatest factor in determining ultimate traffic capacity.

The Barsi steel sleepers weigh 40 lbs. each. In laying these sleepers they are spaced at distances so arranged that there is equal resilience, both as regards rail joints and throughout the intermediate length of rail. The unusual smoothness of the Barsi track, laid on this principle, has been generally remarked by those who have travelled over the line, and will no doubt have a perceptible effect in prolonging the life of the rails, and also in reducing wear and tear on the springs of rolling stock.

In opening up new country, timber, however, can often be had for the cutting, and wherever good hardwood sleepers are available and can be prepared in a reasonable time, they should be employed, as they are much cheaper in first cost than steel.

The principal novelty in the Barsi rolling stock has been the adoption of a uniform working axle-load throughout for engines, wagons, and carriages, the
working axle-load being also the maximum adopted, namely, 5 tons per axle. Maximum carrying capacity on the minimum weight of rail can be secured only by uniformity of axle-load.

The Barsi engines are capable of hauling a train load of 1,036 tons at 15 miles an hour on a level, straight line, and 291 tons at 8 miles an hour on a gradient of 1 in 100 combined with a 600 ft. curve. In mountainous districts the engines can haul a train load of 147 tons on a gradient of 1 in 50 combined with a 250 ft. curve, and 69 tons on a gradient of 1 in 25 on the same curve, both at 8 miles an hour.

The Barsi wagon stock has been designed to obtain the greatest bulk and weight carrying capacity on the lightest possible tare weight compatible with a proper reserve of strength. The wagons are of three types, low-side, high-side, and covered. They are all of one standard length, namely, 25 feet over headstocks, and are 7 feet wide. The low-side wagon, weighing 4 tons 2 cwt., carries a maximum load of 15 tons 18 cwt., or nearly four times its own weight. The high-side wagon has a capacity of 500 cubic feet, weighs 5 tons 7 cwt., and carries 14 tons 13 cwt. The covered wagon has a capacity of 1,000 cubic feet, weighs 5 tons 18 cwt., and carries 14 tons 2 cwt. Besides goods, this is capable of carrying 6 cavalry horses, their attendants, and a week's supply of compressed forage.

Light tare weight effects a permanent economy in working expenses by making it possible to carry a greater quantity of goods in each train at the same cost as regards coal, oil, and wages. As the deadweight of the train is thereby reduced in proportion to the weight of goods carried, there is of course less wear and tear on the permanent way. These gains, please note, constitute an actual saving of revenue day by day and year by year in respect of every train that is run. In regard to capital cost the results are of no less importance, as lighter engines and permanent way can be used.

The Barsi carriage stock is also of one standard length, namely, 40 feet over headstocks. Both carriages and wagons are fitted with bogies as shown, and are capable of running round a curve of only 100 feet radius. Two classes only are in use, upper and lower class.

Mr. Calthrop showed a series of photographs with the object of giving a practical idea of what had been accomplished at Barsi in building a railway at a cost of about £3,000 per mile, including rolling stock. The work shown was all of a substantial and permanent character, the buildings being numerous, spacious, and built of solid stone.

The Barsi Light Railway was only opened for traffic in March last; but during its first half-year's working, the working expenses in India were just below 50 per cent. of the gross receipts, and the net profits earned were in excess of 4 per cent. on the capital of the Company, notwithstanding an almost unexampled
combination of troubles, including plague, cholera, and famine, and their ruinous effects upon traffic.

**Discussion.**

Lieut. Leggett, R.E. (Traffic Manager of Woolwich Arsenal), wrote in support of Mr. Calthrop's views as to the importance of economy in the prime cost of light railways, and said it was difficult to think that the special conditions in each case made a gauge of 3 feet 6 inches necessary for the Soudan and Rhodesian lines, 3 feet for the Uganda line and 2 feet 6 inches for the Sierra Leone line. In the event of two of these lines, say the Soudan and Uganda railways, being at some future time joined, the difference in gauge and plant would create very serious difficulties. The inconvenience resulting from the diversity of gauges in the Australian Colonies was also referred to. It was worth while considering whether a standard colonial type and gauge should not be adopted for pioneer lines. Such a type should be suitable to the needs of military expeditions in respect of lightness and rapidity of construction.

Sir Walter J. Sendall, K.C.M.G. (Governor of British Guiana), said he came to learn some useful facts respecting light railways, with a view to formulating a scheme for their introduction into Cyprus, where the question had been for some time under consideration, and where the feeling was in favour of as narrow a gauge as was consistent with a proper carrying capacity. Many of the points raised in the paper were quite novel to him, especially the adaptation of such rolling stock as had been seen on the screen to a narrow gauge line. / Sir Alec Wilson said that in his capacity as chairman he had opened the Barsi railway on March 20 last, and seen for himself its capabilities. No type of railway was more suitable for opening up undeveloped country, and connecting branch lines with the great trunk lines.

Mr. R. W. Perks, M.P., expressed the opinion that the soundest method of constructing light railways was usually by means of private enterprise and not under Government control. He feared that the cost of the Uganda railway would very largely exceed the Government estimate, and he was persuaded that if the undertaking had been entrusted to experienced, able, and responsible contractors it would not only have cost very much less money, but would have been completed in very much less time.

Sir Frederick Young, K.C.M.G., said that in all scientific work men qualified to invent something superior to what had been done before were needed. It was of the utmost importance that we should know the very best methods of constructing railways throughout the length and breadth of our Colonies. He quoted South Africa in illustration of the benefits that new countries derive from such necessary adjuncts of civilisation.

The Chairman said they were indebted to Mr. Calthrop for his paper, which would be of service both to the civilised and uncivilised world. He had
shown it to an expert, who had pronounced the arguments employed to be perfectly sound throughout. The two cardinal points of the paper were the necessity of a uniform axleload and light tare loads. On the Irish railways the heavy locomotives in going over light rails sometimes tore them to pieces. With regard to the light railway proposed to be built from Suakin to Berber in 1885 which would have answered all practical purposes if made of the 2 ft. 6 in. gauge, the War Office decided to make a 4 ft. 6 in. gauge line, which is unnecessarily heavy and expensive for such a line.

[...]
EDITORIAL NOTES

Crown Agents to Colonial Office

1. M. F. OMMANNEY: Sir Montague Frederick Ommanney, War Office and Admiralty architect (1866–70); instructor at the Royal Military Academy (1871); private secretary to Lord Canarvon, Colonial Secretary of State (1874); Crown Agent (1877–1900); Under-Secretary of State for the Colonies (1900–7).


3. The foreshore: The African Steamship Company was founded in the middle of the nineteenth century by Macgregor Laird. It was purchased by Elder Dempster & Co. Ltd in 1891.

4. garden egg: a hairy upright herb native to southeastern Asia and widely cultivated for its edible fruit.

5. plantain: a large, tropical, tree-like herb (Musa paradisiaca).

6. Colonial Rubber Estates Company: founded in 1897 with a capital of £100,000 and acquired the rights to collect and gather rubber over an area of 640,000 acres of West Africa.

7. the African Gold Coast Company: founded in 1878 by the French trader J. Bonnat who had acquired a concession in Tarkwa. Operations began first at Awudua and later at Tarkwa.

Sierra Leone (Kwalu) Railway Survey

1. Sir Frederic Cardew: Governor of Sierra Leone (1894–1900).

2. Mr Gaffney: The hut tax was charged on a per hut or household basis and payable in money, labour, grain or stock. The Hut Tax War of 1898 was a war of resistance. It was initiated by Temne Chief Bai Bureh and later involved other native peoples, including the Mende, and was an attempt by the local African kingdoms to maintain their independence in the face of Britain's 1896 declaration of a protectorate over Sierra Leone. The war was sparked by an attempt by British officials to collect hut tax.

3. piassava: a palm, the stiff coarse fibres of which were used in cordage or brushes.

4. abutments: an abutment is a structure that supports the end of a bridge.

5. chs: chains. A chain is a unit of length equal to 100 feet.

6. grade: the degree of inclination of a slope.

7. piles: A pile is a heavy beam of timber, concrete, or steel driven into the earth as a foundation or support for a structure.
High Commissioner Sir F. Lugard to Mr. Chamberlain

2. Sir Ralph Moor: Sir Denham Rayment Moor (1860–1909), Vice-Consul (1892) and later Commissioner (1892–3) for the Oil Rivers district of Nigeria, Commissioner and Consul-General for the Niger Coast Protectorate and Consul for the Cameroons and Fernando Po (1896–1900), High Commissioner of the British Southern Nigeria Protectorate (1900–3).
3. Haussa: The Hausa are the largest ethnic group in West Africa. The Hausa Kingdoms were a collection of independent city-states situated between the Niger River and Lake Chad.

Construction of Foreign Railways in West Africa

1. Captain C. F. Cromie to the Marquess of Lansdowne: Henry Charles Keith Petty-Fitzmaurice, fifth Marquess of Lansdowne (1845–1927), Liberal and Conservative politician who served successively as the fifth Governor General of Canada, Viceroy of India, Secretary of State for War, and Secretary of State for Foreign Affairs.
2. artesian wells: An artesian well is a well drilled through rock to reach water capable of rising to the surface by internal hydrostatic pressure.
3. diabase: a dark-grey to black, fine-textured igneous rock containing feldspar and pyroxene.
4. angle iron: a piece of steel or iron bent at a right angle and used as a support or structural framework.

Mr. Lyttelton to Governor Egerton

1. Mr. Lyttelton to Governor Egerton: Walter Egerton (1858–1947), Governor of Lagos Colony (1904–6) and of Southern Nigeria (1906–12).

Memorandum by Mr. Churchill


Shelford, Some Features of West African Railways

1. Aneroids: An aneroid barometer is a barometer in which variations of atmospheric pressure are indicated by the relative bulges of a thin elastic metal disk covering a partially evacuated chamber.
2. Tacheometers: A tacheometer is a type of theodolite designed for the rapid measurement of distances, elevations and directions.
3. chronometer: an exceptionally precise timepiece.
4. borrow-pits: A borrow pit was dug to obtain embankment earth. If not drained, the pits became breeding grounds for disease carrying mosquitoes (*West Africa*, 15 August 1903, pp. 171–3).
5. derricking gear: A derrick is a machine for hoisting and moving heavy objects. It consists of a moveable boom equipped with cables and pulleys and connected to the base of an upright stationary beam.
6. capstan: an object used for hoisting weights. It consists of a vertical spool-shaped cylinder that is rotated manually or by machine and around which a cable is wound.
7. quoins: A quoin is an exterior angle of a wall or other piece of masonry.
8. eternit: Eternit is a fibre cement.
9. pony truck: a leading truck with only two wheels.

*The Nigerian Railway*

1. *Admiralty steam coal*: a high-quality, smokeless coal ideal for the production of steam.

**De Frece, The Failure of Officialdom**

3. Mr. Lloyd George: David Lloyd George, first Earl Lloyd-George of Dwyfor (1863–1945), Liberal politician and statesman. Prime Minister of the UK from 1916 to 1922 and the Leader of the Liberal Party from 1926 to 1931.
4. Lord Midleton: William St John Fremantle Brodrick, first Earl of Midleton (1856–1942), Conservative Party MP. Secretary of State for War (1900–3) and Secretary of State for India (1903–5).
5. Mr. Herbert Samuel: Herbert Louis Samuel, first Viscount Samuel (1870–1963), diplomat and Liberal Party MP. High Commissioner of Palestine (1920–5) and Home Secretary in 1916 and from 1931 to 1932. A noted Zionist.
6. the last Ashanti War: The Fourth Anglo-Ashanti War lasted from 1894 to 1896. The war started on the pretext of the failure to pay the fines levied on the Ashanti monarch by the Treaty of Fomena after the third (1874) war.
O’ Callaghan, ‘Uganda Railway’

1. Sir Alexander Rendel: Sir Alexander Meadows Rendel (1828–1918), consulting engineer to the India Office, the East India Railway and other Indian railroads.
2. Tsetse fly: two-winged blood sucking African fly of the genus Glossina, which often carries and spreads pathogenic trypanosomes to humans and livestock.
3. aloes: Aloe bushes have rosettes of succulent, often spiny-margined leaves and long stalks that bear yellow, orange, or red tubular flowers.
5. scantlings: small timbers used in construction.
6. teredo navalis: wormlike marine mollusks of the genera Teredo and Bankia. They bore into wood, especially submerged timbers, and can do extensive damage.
7. angle iron: a length of steel or iron bent at a right angle and used as a support or structural framework.
8. jib: the arm of a mechanical crane.
9. ‘Vignoles’ pattern steel rails: named after their inventor, Charles Vignoles, an early railway engineer.
10. Abney’s levels: An abney level is a surveying instrument comprising a spirit level and a sighting tube and is used to measure the angle of an inclination.

Emett, ‘Some Curiosities of the Uganda Railway’


Memorandum for the Private Enterprise Committee

1. GIDEON MURRAY, MASTER OF ELIBANK: Gideon Oliphant-Murray, second Viscount Elibank (1877–1951), Scottish politician. Private Secretary to Commissioner for Native Affairs, Transvaal (1901); Assistant Native Commissioner, Zoutpansberg (1902–6); and Assistant Private Secretary to the Permanent Under-Secretary of State for the Colonies (1907–9).
3. the Anglo-Persian Oil Co: founded in 1908 on the discovery of large oil deposits at Masjed Soleiman, Persia. In 1935, it was renamed the Anglo-Iranian Oil Company, and, in 1954, became the British Petroleum Company (BP).

Smith Wright, Railways in Rhodesia

1. Sir Arthur Lawley: Arthur Lawley, sixth Baron Wenlock (1860–1932), politician, soldier and administrator. He served as the administrator of Matabeleland (1898–1901), Governor of Western Australia, Lieutenant-Governor of Transvaal and Governor of Madras.
2. **Blackwood’s Magazine**: published between 1817 and 1980. It was founded by William Blackwood (1776–1834) and was originally called the *Edinburgh Monthly Magazine*.

3. **mopani trees**: Colophospermum (or Copaifera) mopane, is native to southern Africa, highly resistant to drought and produces very hard wood. It is also known as ironwood.


‘Contract for the Construction of a Railway’

1. **ERNEST EDWARD BLAKE Esq.**: Sir Ernest Edward Blake served as a Crown Agent from 1881 to 1909.

2. **MAURICE ALEXANDER CAMERON**: Sir Maurice Alexander Cameron served as a Crown Agent from 1895 to 1920.

3. **ex parte**: from or on one side only, with the other side absent or unrepresented.

**Central Africa Railway Company Limited and Shire Highlands Railway Nyasaland Limited and the Crown Agents for the Colonies on behalf of the Nyasaland Government: Conditional Agreement**

1. **The Cleveland Bridge and Engineering Company Limited**: founded in 1877. It constructed the Victoria Falls Bridge.

**Dalton, A Report and Estimate Concerning the Construction and Equipment of a Railway**

1. **Flat trucks**: A flat truck is a truck whose body is in the form of a platform.

2. **Culverts**: A culvert is a drain channel.

**Owen, Report and Estimate in Connection with Caledon Surveys**

1. **triangulation**: a surveying technique in which a region is divided into a series of triangular elements based on a line of known length so that accurate measurements of distances and directions may be made via the use of trigonometry.

**Railway Construction: Zoutpansberg District**

1. **Selati Line**: The Selati Railway Company was established in Brussels by Baron Openheim and his brother to build a railway line from Komatipoort to the new Transvaal gold field near the Selati River. Unfortunately, after building 80 kilometre of track, the company went bankrupt. The line then lay idle until 1912 when the South African Railways took over and extended it first to Tzaneen and later to Soekmekaar.

2. **Messina Copper Mine**: The company was established in 1905 by Lt Colonel J. P. Grenfell. By 1914, Messina was exporting high-grade matte to Welsh refineries, and, by 1940, was producing 10,000 tonnes of copper pa (N. J. Van Warmelo, *The Copper Mines of Musina and the Early History of the Zoutpansberg* (Pretoria: Department of Native Affairs, 1940)).
3. **Guaranteed Loan or other source:** The loan was for £5m, £2.5m was given to the Land and Agricultural Bank and the remainder was to be used for railways, public works, irrigation, agricultural settlement and development.

4. **banket and other reefs:** A banket reef is one that contains gold.

5. **antimony:** A metallic element used in a wide variety of alloys, especially with lead in battery plates, and in the manufacture of flame-proofing compounds, paint, semiconductor devices and ceramic products.

6. **mica:** Aluminum silicate minerals used in insulation and electrical equipment.

7. **auriferous:** Auriferous deposits are gold-bearing.

8. **Adit:** An adit is an almost horizontal entrance to a mine.

9. **tributors:** Self-employed miners.

10. **steam stamp mill:** A machine comprising a heavy bar that moves vertically for pounding or crushing ores.

11. **stilbrite:** A lead-gray mineral that is the chief source of antimony.

12. **dwt.:** DWT – deadweight tonnage.

13. **stamp battery:** A mill in which ore is crushed with stamps.

14. **schist:** Medium to coarse grained metamorphic rock composed of laminated and parallel layers of micaceous minerals.

15. **pyritic:** Pyrite is a brass-coloured mineral used in the production of sulfur dioxide and sulfuric acid. Also called ‘fool’s gold’.

**Tanganyika Territory**

1. **T. Shaw:** Thomas Shaw (1872–1938), trade unionist, Labour Party politician and Minister of Labour (1924).

2. **Sir Montague Barlow:** Sir (Clement) Anderson Montague-Barlow, first Baronet (1868–1951), barrister, Conservative Party politician, Minister of Labour (1922–4).

3. **the League of Nations:** The League of Nations was an intergovernmental organization founded as a result of the Paris Peace Conference of 1919.

4. **the Union-Castle Line:** The Union-Castle Line was a shipping line that operated a fleet of passenger liners and cargo ships between Europe and Africa from 1900. It was formed from the merger of the Union Line and Castle Shipping Line.

5. **British India Steam Navigation Company:** The British India Steam Navigation Company was formed in 1856 as the Calcutta and Burmah Steam Navigation Company. Its main shipping routes were Britain to India, Australia, Kenya and Tanganyika.

6. **East African Lighterage Company:** worked the ships of the Clan and Ellerman lines, the Harrison combine and Japanese and German lines.

7. **pontoons:** A pontoon is a floating structure, such as a flat bottomed boat, that is used to support a bridge.

8. **the African Wharfage Company:** owned by T. B. Davis Ltd of Durban. It held the stevedoring contracts for the British India line, the Union Castle line and French and Italian lines and some of the Coaling ships at Mbaraki.

**Natal Government Railways. Draft Law**

1. **debenture:** Debentures were bearer securities, the ownership of which was not recorded. They could therefore be sold without reference to the issuing house or payment of stamp duty. Although popular with the City, they were disliked by the public, as they were
liable to theft or misappropriation, and, to obtain dividends, coupons attached to the certificate had to be sent to the issuing house.

2. **time of issue**: On issue, each debenture was offered for a set price that was above or below the ‘par’ price (£100) at which it would eventually be repaid. The Crown Agents generally set below-par prices, as trustees were averse to purchasing stock at a considerable premium and they were prohibited by law from buying above par securities if they managed trusts with less than fifteen years to run.

### Report of the Select Committee on Railway Labourers

1. **Cape Town and Wellington Railway**: The Cape Town and Wellington railway was completed in 1863.
2. **navvies**: A navvy is a labourer.
3. **battery**: an emplacement for one or more pieces of artillery.
4. **Sir Lowry’s Pass**: a mountain pass that crosses the Hottentots-Holland mountain range between Somerset West and Grabouw. Houwhoek Pass crosses between Grabouw and Botrivier.

### Calthrop, ‘Light Railways in the Colonies’

1. **tare weight**: the weight of a vehicle or container when it is empty.
2. **Mr. Calthrop**: Everard Richard Calthrop (1857–1927), railway engineer and inventor. He promoted and built narrow gauge railways. Later in life, he took an interest in aviation, patenting some early parachute designs.
3. **Sir Walter J. Sendall**: Sir Walter Joseph Sendall (1832–1904). Governor-in-Chief of the Windward Islands from 1885 to 1889, Governor of Barbados from 1889 to 1891, High Commissioner of Cyprus from 1892 to 1898, and Governor of British Guiana from 1898 to 1901.
5. **Sir Frederick Young**: Sir Frederick Young (1817–1913), traveller and writer on imperial affairs.
BRITAIN AND AFRICA SERIES

COMMUNICATIONS IN AFRICA, 1880–1939
Britain and Africa Series

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Advisory Editor: Godfrey N. Uzoigwe

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The Government and Administration of Africa, 1880–1939
Casper Andersen and Andrew Cohen (eds)
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**Operation of Lines**

J. H. Smith, *Report upon the Administration, Organisation and Working of the Natal Government Railways* (1903)  
S. Herbert Frankel, *Memorandum on Railway and Harbours Working and Finance* (1933)  

**Editorial Notes**
OPERATION OF LINES

The majority of British African railways were operated by local administrations. As discussed in the General Introduction in Volume 1, Rhodesian and early South African lines were built and operated by private companies, but were gradually acquired by the state (see Hammond, *Report on the Railway System of Southern Rhodesia* (1925), below; Smith, *Special Railway Commissioner, upon the Administration, Organisation and Working of the Natal Government Railways* (1903), below; and Herbert Frankel, *Memorandum on Railway and Harbours Working and Finance* (1933), below). In West Africa (see Hammond, *Report on the Sierra Leone Government Railway* (1922), below), Uganda, Kenya (apart from the Konza–Magadi railway) and Tanganyika (see Hammond, *Report on the Railway Systems of Kenya, Uganda and Tanganyika* (1921), below, and Hammond, *Report on the Railway System of Tanganyika Territory* (1930), below) all the lines were publicly built and managed – in West Africa by individual country authorities, and in Uganda and Kenya after the First World War, by the East African Railways Corporation.¹ Proposals that government constructed lines be operated by the private sector were swiftly dismissed by both the Crown Agents and the Colonial Office. It was pointed out that contractor-run railways in the UK were poorly managed, that the absence of cost and revenue information would discourage contractors bidding for the management of railways and that those that did tender would submit excessively low offers that colonial officials would have difficulty judging. The local government would also be obliged to continue to bear its public responsibility as regards safety and would have to closely and expensively monitor operations to prevent the setting of excessive freight rates.²

Although they contributed greatly to economic development, the majority of lines were commercially unsuccessful.³ Losses were the result of both high costs and low revenues. Costs were raised by the basic nature of construction; in West Africa, by the poor quality of the lines built; various problems with expatriate and African labour; and inadequate organization of railway departments. The higher operating costs that arose from basic construction are summarized in Table 1; while a good example of a railway with high running costs caused
by poor quality construction is the Gold Coast Sekondi–Kumasi line. The steep gradients and tight curves of the railway restricted the haulage capacity of engines, badly laid track demanded almost continuous track maintenance and replacement, poorly built river crossings led to bridge speed limits, the failure to cut a wide right-of-way through forest increased the incident of falling trees that blocked and damaged track, and grades, curves and track problems resulted in numerous derailments and accidents.4

Table 1: The Impact of Lines of a Lower Standard on Operating Costs and Carrying Capacities.5

<table>
<thead>
<tr>
<th>Pioneer feature</th>
<th>Impact on operating costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrugated iron pipes</td>
<td>Increased incidence of costly washouts and slips</td>
</tr>
<tr>
<td>Incomplete earthworks</td>
<td>Higher maintenance costs</td>
</tr>
<tr>
<td>Light rails</td>
<td>Less durable than heavy rails; light engines essential</td>
</tr>
<tr>
<td>Narrow gauge rolling stock</td>
<td>Relatively expensive and small. More prone to breakdown than broader gauge counterpart. Smaller trucks increased empty haulage and siding needs</td>
</tr>
<tr>
<td>Narrow gauge track</td>
<td>Comparatively unsafe and subject to costly accidents. Truck size has little effect on administration and supervision, the largest component of working costs</td>
</tr>
<tr>
<td>Native wood sleepers</td>
<td>Shorter lifespan and required more maintenance than steel sleepers</td>
</tr>
<tr>
<td>Restricted station accommodation</td>
<td>Loading difficulties</td>
</tr>
<tr>
<td>Trestle bridges</td>
<td>More likely to collapse than stone bridges</td>
</tr>
</tbody>
</table>

Costs were further increased by the appointment of advisory consulting engineers and expatriate staff. In order to ensure that completed lines worked efficiently and economically, their operation in the Crown colonies was initially supervised by consulting engineers, who provided advice on rates, staffing and management structures and track and equipment purchase and maintenance.6 For these duties, the West African consulting engineer, Frederic Shelford, received an annual salary plus expenses and recruitment and purchasing fees.7 Not surprisingly, Shelford’s work was subject to a number of criticisms. It was argued that his remuneration was excessive, a claim supported by a comparison of consulting engineer/Crown Agent operation fees (see Table 2); in order to maximize his own income and avoid criticisms of the operation of lines, he recommended the purchase of expensive rolling stock and staff; and he failed to closely monitor the working of lines. He rarely visited Africa and his knowledge of railway operations was based on generally out-of-date reports and correspondence with general managers, who could easily omit information. More importantly, he insisted that completed lines be managed by highly remunerated general managers, selected by himself, and that colonial government involvement should be kept to a minimum, even when it was plain that railway departments were being
inefficiently administered. Aware that Shelford’s supervision of the operation of railways was as inadequate as his construction of them, the Crown Agents in 1904 sought to take over some of his duties, but were repulsed by the Colonial Office. A further attempt in 1911 was more successful, and, by the start of the First World War, they had acquired most of his workload.8

### Table 2: Fees and Salaries of Open Line Consulting Engineers.9

<table>
<thead>
<tr>
<th></th>
<th>West Africa</th>
<th>Crown Agents</th>
<th>Ceylon</th>
<th>Crown Agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average annual mileage supervised</td>
<td>1,300</td>
<td>1,727</td>
<td>946</td>
<td>1,747</td>
</tr>
<tr>
<td>Average annual remuneration per mile (£)</td>
<td>6.01</td>
<td>1.96</td>
<td>5.15</td>
<td>1.82</td>
</tr>
</tbody>
</table>

The use of expatriate employees similarly raised costs. It took months to recruit staff, who were often incompetent and/or inexperienced, became so ill that they were unable to work, or died, and stayed in their posts for a relatively short period of time.10 Faced with such criticisms, the Crown Agents, who filled all technical appointments, pointed out that recruitment of high quality technical staff was a formidable task. The construction of railways around the world had resulted in shortages of specialist workers, colonial administrations often demanded highly qualified candidates or combinations of skills impossible to find in one person, and few Englishmen wished to work in Africa. Apart from the health risks, salaries were often relatively low, promotion slow, appointments initially only for two tours of duty and permanent pensionable employment gained only if officers performed their roles well.11 Employment also involved a number of hidden costs – for example, successful candidates had to purchase special equipment and clothing, the cost of passage to Africa was subtracted from future salaries and only reimbursed on their first home leave, some colonies refused to allow wives to accompany appointed officers, forcing the maintenance of two households, and, on their return to Britain, ex-colonial staff often found it difficult to obtain fresh employment, as the colonial experience gained was usually practically useless. A further reason for the inadequacies of recruitment, however, was the Crown Agents’ appointment procedure. Prior to 1911, candidates were chosen by the consulting engineer who worked in the employing colony and specialized in the technical area of appointment. As regards West Africa, recruitment was undertaken by Shelford, who delegated the task to a clerk, and, receiving a fee of five guineas for each man selected, had a monetary incentive to choose candidates who would break their contract before they sailed or would prove unacceptable. Aware of Shelford’s failings, the Agents took over his duties
in 1911, with the result that the quality of recruits noticeably improved, though the recruitment process remained lethargic.\footnote{12}

The obvious solution to the problems of obtaining expatriate skilled staff was to employ Africans or other nationalities (who were also cheaper). Unfortunately, few colonies were willing to replace expatriate workers with trained Africans. It was thought that ‘natives ... did not take kindly to mechanical work or any work requiring sustained effort’ and European staff were loath to train them, often being racist and wishing to protect their jobs.\footnote{13} Some administrations, however, relented. The Gold Coast Sekondi–Kumase line after 1907 began to hire and train a few Fanti men for skilled mechanical roles, and there was further Africanization of posts during the First World War and towards the end of the period.\footnote{14} Administrations looked more kindly on other nationalities. The Kenyan and Ugandan governments, for example, employed large numbers of Indians as drivers, foremen, station masters and so on, though an attempt to follow a similar policy in Lagos in 1903 was opposed by the Crown Agents, who claimed that Indians would be difficult to recruit and would have difficulties adjusting to the West African climate. Other nationalities employed included Afrikaners, found in Rhodesia and South Africa, and West Indians, seven of whom worked at the turn of the century in the Gold Coast and Sierra Leone.\footnote{15}

Africans were largely used for non-skilled work, but, again, were often difficult to recruit. There was competition for labour from agriculture, mines and trading companies, and many Africans were reluctant to work on the railways. Wages were low, owing to the low revenues of lines and the fear that high wages would attract workers away from agriculture/mining and thus weaken colonial economies, and many of the posts were in towns where living costs were relatively high.\footnote{16} Railway work also involved long hours and poor working and living conditions. Many recruits were killed or severely injured by runaway trains etc, the housing provided both in segregated towns and rural camps was often of poor quality and the work of the gangers, who maintained and repaired track, was hard and tedious.\footnote{17} Railway authorities responded to the shortages by employing workers on a temporary or day-to-day basis, which also reduced labour costs; recruiting European staff – Italians and Greeks in Rhodesia and South Africa, respectively – and gradually improving wages and working and housing conditions.\footnote{18} In Natal and the Cape in the 1930s and 1940s, model railway villages were erected, and, from 1938, South African Railways initiated a community development programme.\footnote{19}

Finally, costs were increased by high debt charges and the high cost of coal, African theft of railway materials and the poor structure and financial management of some railway departments.\footnote{20} The Gold Coast railway administration, for example, suffered from unclear lines of authority, interdepartmental rivalries, over-concentration of power in the hands of the resident engineer, admin-
istrative structures that overlapped and personality clashes. The costs of the Kenya–Nairobi–Thika railway, meanwhile, were excessive because the officers of the Uganda Railway simply refused to incorporate it into their own operations. Structural problems were matched by poor accounting and poor decision making. As regards the Gold Coast Sekondo–Kumase line, the expenditure account excluded loan interest payments and Sinking Fund charges, capital improvements were initially financed from the local Treasury and only later applied to the revenue account, locomotives were purchased that lacked automatic breaks, and the line possessed few safety devices and no semaphore signals, making accidents an almost weekly occurrence.

Turning to the other side of the cost–revenue equation, as already discussed in the General Introduction in Volume 1, in West Africa the Crown Agents and consulting engineers deliberately exaggerated anticipated receipts in order to encourage the building of lines. Construction costs also failed to be covered for a host of other reasons. Some lines, such as the Uganda Railway and many of those in South Africa, were constructed for non-economic political or administrative purposes. For others, the anticipated traffic failed to emerge, the construction of rival lines led to intense competition, as occurred in the Transvaal/Cape, and tariffs were sometimes forced down for the good of the economy by local governments. In Rhodesia, administrators put pressure on railway authorities to reduce seed cotton rates, and, in Kenya, to cut maize tariffs.

Administrations and railway authorities responded to operating losses in a number of ways. While some set low freight rates in order to generate traffic, a far larger number used their monopolistic power to introduce excessively high tariffs. The Kenya Nairobi–Thika line, the Nyasaland and Rhodesian railways and the Transvaal NZASM company all pursued this policy. Other administrations and railway authorities sought to maximize returns by extending lines into new territories (see the Construction thematic introduction in Volume 1); through the building of branch lines, which broadened a railway’s hinterland; as discussed in the Road thematic introduction in Volume 5, by encouraging the building of feeder roads and establishing road haulage companies; and, in South Africa, via electrification. There was also some cross-subsidization of tariffs designed to increase traffic. The low agricultural freight rates of the Rhodesian extension to the Congo border, for example, were made possible by the higher tariffs charged for the large amounts of Katanga copper carried by the line.

Notes


5. Sunderland, Managing the British Empire, p. 108.


7. Shelford’s involvement in the purchase of rolling stock is discussed in the General Introduction (Volume 1).

8. Sunderland, Managing the British Empire, pp. 145–8; Dumett, ‘British Imperial Transport Management’.


10. Ibid., p. 257; Dumett, ‘British Imperial Transport Management’. European mortality in the Gold Coast was 7.5 per cent (Sunderland, Managing the British Empire, p. 259).


13. Glaster to Colonial Secretary, 19 December 1902, National Archives, Kew, CAOG 13/283; Sunderland, Managing the British Empire, p. 262.


20. Jaekel, *The History*. Debt charges are discussed in the General Introduction (Volume 1) and the high cost of coal in the Shipping thematic introduction (Volume 5).


22. Mwaruvie, ‘Kenya’s Forgotten Engineer’. The two lines were merged in 1913 (ibid.).

23. Dumett, ‘British Imperial Transport Management’. The railway’s accounting procedures were reorganized in 1908 (ibid.).


27. The South African Railways, for instance, lowered tariffs in order to increase traffic (Katzenellenbogen, ‘Zambia and Rhodesia’).


29. The first electric trains ran between Daimana (Ladysmith) and Chieveley in 1924. The Booth–Cato Ridge line was electrified in 1936 and the first electric train arrived in Durban in 1936.


SOUTHERN RHODESIA.

REPORT

BY

Brigadier-General F. D. Hammond, C.B.E., D.S.O,

ON THE

Railway System of Southern Rhodesia

Under the ‘Railways Enquiry Act, 1924.’

VOL. I.

PARTS I. AND II.

Presented to the Legislative Assembly,

1926.

Salisbury, Rhodesia:

[...]
PART I.

Bulawayo,
Southern Rhodesia,
5th September, 1925.

His Excellency,

Lieut.-Colonel Sir JOHN R. CHANCELLOR,¹
G.C.M.G., G.C.V.O., D.S.O., R.E.,
Governor of Southern Rhodesia,
Salisbury.

Sir,

I have the honour to forward this, the first portion of my report on the Railways of Southern Rhodesia, under the Railways Enquiry Act of 1924.

The terms of my reference are contained in Clause 2 of that Act, which reads as follows:–

‘The Governor-in-Council may, if he deem fit, at any time after the coming into force of this Act, appoint any person or persons to enquire fully into and report upon the conduct, administration, finances and general affairs of any railway or railways.’

These terms of reference were supplemented by the following letter:–

‘31st March, 1925.
Brigadier-General Hammond, C.B.E., D.S.O.

With a view to leaving you as free a hand as possible in the prosecution of your Enquiry, the Government do not propose to issue more detailed Terms of Reference than those contained in Clause 2 of the Railways Enquiry Act, 1924.

There are certain points, however, to which they consider it advisable that your attention should be directed. These points are given in the attached Memorandum. /

In forwarding this Memorandum the Government would point out that they do not intend that it should be considered as in any way comprehensive or as limiting the scope of your Enquiry.

(Signed) H. U. MOFFAT,
Minister of Mines and Public Works.

¹
MEMORANDUM No. 1 FOR GENERAL HAMMOND.

The Railways which serve this Colony and which are operating in Northern Rhodesia, the Union of South Africa, the Bechuanaland Protectorate and Portuguese East Africa as well as Southern Rhodesia are:–

<table>
<thead>
<tr>
<th>Railway Company</th>
<th>Mileage</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Rhodesia Railways, Limited</td>
<td>1,396</td>
</tr>
<tr>
<td>The Mashonaland Railway Co., Ltd.</td>
<td>607</td>
</tr>
<tr>
<td>The Beira Junction Railway Co., Ltd.</td>
<td>35½</td>
</tr>
<tr>
<td>The Beira Railway Company, Ltd.</td>
<td>168½</td>
</tr>
<tr>
<td>The Blinkwater Railway Co., Ltd.</td>
<td>123</td>
</tr>
</tbody>
</table>

Total mileage: 2,330

The Railway line operating from Broken Hill to the Congo Border, 132 miles, owned by the Rhodesia-Katanga Junction Railway and Mining Company, Limited, is leased to and is under the same management as the above Railways.

Total: 2,462

A full enquiry is required into the affairs of these Companies, particularly in regard to the following matters:–

1. The Capital issues of the Companies, particulars of shares issued for cash and of shares issued for other than cash.
2. The debenture issue of the Companies, the dates of repayment, the guarantees of capital and interest and terms conditions of the issues and of the repayments.
3. How the Capital raised was expended, including the expenditure on works which have subsequently been abandoned.
4. The financial position and connection between the various Companies, the working arrangements and Agreements between them.
5. The position of the Railway Companies (the Beira Junction Railway Company, Limited, and the Beira Railway Company, Limited) in Portuguese East Africa and at Beira, the rights they hold under Treaties between the British and the Portuguese Government under the Van Laun Agreement, and any other contracts or agreements between the Railway Companies and the Mozambique Company.
6. The connection between the Railway Companies and –
   1. The British South Africa Company;
   2. The Rhodesia Railways Trust, Limited;
   3. The Beit Trust;
   and how their working, finance and policy is controlled by these concerns, whether by agreements or otherwise.
7. The revenues of the various Railways and the amounts drawn from the various traffics and other sources.
8. The working expenses, viz., the costs of running and working the Railways, whether these are reasonable or whether reductions could be made with out loss of efficiency.
9. The reserves set aside by the Companies for renewals and depreciation, whether the amount already set aside and the annual provision being made are fair and fair and reasonable or excessive, in view of the annual amounts spent on renewals and in maintenance of the permanent way and rolling stock.
10. Whether any portion of the provision for depreciation and renewals (see last combined balance sheet) has been expended on renewals of rolling stock and permanent way and works, or whether such necessary renewals have been provided solely out of revenue. / 

11. Whether any fresh expenditure on capital account, viz., erection of buildings or purchase of new machinery and plant is in the accounts of the Railways being charged direct to working expenditure. 

12. Whether the profits, namely, the balance of revenue over expenditure, which includes the provision for a reserve in Clause 9, are excessive. 

13. And therefore whether the rates and fares charged are fair and reasonable or excessive; the effect of the present rates on the industries of the country, particularly mining and farming. 

14. Do the fares and rates as now charged act to the prejudice of this Colony in comparison with those charged in the other countries served by the Railways? 

15. Whether the charge of £7 per ton per annum for the carriage of Government mails in Southern Rhodesia is excessive. 

16. The Port of Beira. Whether provision at Beira has been sufficient and whether the developments and extensions proposed are sufficient to meet the reasonable needs of this Colony, having regard to increase in the traffic of this Colony and from the other countries using the port. 

17. Is the equipment of the Railways, the rolling stock, etc., sufficient for the traffic requirements, particularly in view of a certain expansion of traffic in the near future? 

18. Whether, having regard to the requirements of mining, farming, commerce and of the general public, the equipment and administrative organization of the Railways produce the best commercial results. 

19. Is the traffic of the Railways actually operating in this Colony sufficient to support the Railway system of the Colony on the present basis? 


In order to explain the reason for the division of my enquiry into two parts, it is necessary to point out that the subjects to which my attention was directed in the Memorandum of Instructions fell into two categories. In respect to the first, I was requested to record an opinion on various aspects of the Railways’ present activities, charges and finance, and their effects on the industries of the country. As these included, inter alia, such questions as whether or not the profits are excessive and whether or not the rates are fair and reasonable, it was essential that I should adopt a strictly impartial attitude towards them, more particularly in view of the special powers granted to me. 

In the second category, I was asked to advise as the future policy of the country, not only in regard to the general problem of railways, but also in respect of certain specified subjects. In this second part, therefore, I was acting merely as the adviser of the Government, and it was no longer incumbent on me to treat the subject from a purely impartial standpoint. 

These considerations rendered the division of the enquiry into two parts a necessity. 

[...]
The railways enumerated in the Letter of Instructions as the subject of this inquiry are located in five different countries; they are all of the usual South African 3 feet 6 inch gauge. The following table shows the distribution:

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>TERRITORIES SERVED.</th>
<th>Total milege.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Rhodesia Railways, Limited –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vryburg to Ramatlabama</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ramatlabama to Ramaquabane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ramaquabane to Bulawayo (including Matopos Branch)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salisbury to Victoria Falls Bridge (including Gwelo to Selukwe Branch and Heany Junction to West Nicholson Branch)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victoria Falls Bridge to Kalomo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Mashonaland Railway Company, Limited –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kalomo to Broken Hill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Umtali to Salisbury</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salisbury to Sinoia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mount Hampden Junction to Shamva</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Beira Junction Company, Limited –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beira to Ponte do Pungwe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Beira Railway Company, Limited –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ponte do Pungwe to Umtali</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Blinkwater Railway Company, Limited –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gwelo to Victoria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Rhodesia-Katanga Junction Railway &amp; Mineral Company –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broken Hill to Congo border</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>1,252</td>
<td>506</td>
</tr>
</tbody>
</table>
It will be seen that, of the total mileage of 2,462 miles, 1,252 are situated in Southern Rhodesia, and that of the six companies the Blinkwater Railway Company is the only one which is confined to that Colony.

The whole of the mileage of these six distinct companies is managed by one central organization, situated at Bulawayo, with the exception that the Vryburg-Bulawayo section of the Rhodesia Railways, 588 miles long, is worked under a long-standing agreement by the South African Railways, who render accounts of the results.

Owing to the fact that the Southern Rhodesian portion forms an integral part of the whole, and to the fact that the other portions have in return an important bearing on Southern Rhodesia, it has been necessary for me to view the system as a whole in its relation to this Colony, only differentiation between the various companies when it becomes necessary for financial or other reasons.

These railways were built about twenty-five to thirty years ago as pioneer lines, and they still retain, despite certain improvements which have been effected of late years, the chief characteristics of such lines. It was obviously the intention to avoid any heavy work, and a watershed line was obtained wherever possible. The earthworks are extremely light and the formation width for cuttings and embankments is very narrow, so narrow that in many places there is no proper room for a cess. Only a few stretches of the system are ballasted with stone, and station buildings are limited to the strict minimum. Stations are spaced at long intervals, and great use is made of intermediate crossing places with no resident staff.

Another feature of the system is that in its location it bears unmistakable signs of having been built to suit the needs of the moment, and with little regard to traffic prospects en route. The first section from Vryburg to Bulawayo was built for political reasons through the Bechuanaland Protectorate to the west of the Transvaal Republic, and passes through poor traffic country. The northern extension of the original main line, instead of starting from Salisbury, as originally intended, was finally built from Bulawayo to Wankie and the Victoria Falls, in order to reach the coalfields at former place. This section also traverses poor traffic country. The extension from the Victoria Falls north turns off again practically at right angles to its previous course, and runs roughly parallel to the main Bulawayo-Salisbury line at a distance of 280 to 300 miles.

All the branches, with the exception of the short line from Bulawayo to the Matopos, were built originally to connect various mines to the main line.
CONTROL.

The control of the whole system, with the exception of the Blinkwater Railway and the Rhodesia-Katanga Junction Railway and Mining Company, is in the hands of the British South Africa Company. That Company holds approximately 85 per cent. of the shares in the Rhodesia Railways Trust, which in turn holds 7,989 out of a total of 8,000 shares in the Rhodesia Railways, Limited, and 449,612 out of a total of 450,000 in the Mashonaland Railway Company.

In the Beira Railway Company the voting power in respect of 305,000 ordinary shares out of a total of 600,000 is vested in the British South Africa Company in trust until the 1st July, 1942.

The Beira Junction Railway Company has an issued share capital of 250,000 ordinary shares of five shillings each and 423,583 six per cent. cumulative preference shares, also of five shillings each; the whole of the latter shares, which carry equal voting rights with the ordinary shares, are held by the British South Africa Company, which in this way has full control.

The Blinkwater Railway Company has an issued share capital of 200,000 £1 shares, the whole of which is held by the Beit Railway Trustees. Although in this case the control does not actually rest with the British South Africa Company, as most of the trustees are on the board of that company, it may be said for all practical purposes to be in the same hands, subject, of course, to the provisions of the trust deed.

The Rhodesia-Katanga Junction Company is not controlled by the British South Africa Company, which is, however, represented on the board. The bulk of the ordinary shares were originally issued to the Tanganyika Concessions, Limited; there is no information obtainable locally as to the present owners, beyond the fact that the British South Africa Company has not, either itself or through the various railway companies, a sufficiently large holding to give it control.

As to the control of the British South Africa Company over the other companies, as detailed above, there is no secrecy and no dispute.

MANAGEMENT.

The control of virtually the whole system by the British South Africa Company has simplified the question of management. The Mashonaland Railway Company is the managing company for the whole system, except the Vryburg-Bulawayo section. Agreements for this purpose are in force with the Rhodesia Railways, Limited, the Blinkwater Railway Company, the Beira and the Beira Junction Railway Companies; copies are attached in the appendices. The last agreement of the Mashonaland Railway Company and the Rhodesia Railways, Limited, dated 18th June, 1907, was to the effect that, pending the completion of a fresh working agreement, the Mashonaland Railway Company would work...
the Rhodesia Railways at cost as previously; no new working agreement has been made. Perusal of these agreements shows that the principal features therein affecting this enquiry are the clauses relating to the application of rates and the division of receipts.

In the agreements with the Beira and Beira Junction Railway Companies there is a clause providing that the rates to be charged shall be fixed by a committee, which shall consist of three directors of the Mashonaland Railway Company and two directors of the Beira Railway Company, one of whom shall be a director of the Beira Junction Railway Company, if, in fact, my director of the Beira Junction Railway Company, if, in fact, any director of the Beira Railway Company shall be a director of the Beira Junction Railway Company. The position as to rates in these two companies is thus controlled by the Mashonaland Railway Company, or, in other words, by the British South Africa Company, subject, of course, to such conditions as have been imposed by the Portuguese Government or the Mozambique Company for rates in Portuguese territory.

The agreement with the Blinkwater Railway Company lays down in a schedule the rates to be charged, but provides for alteration with the consent of the companies, parties to the agreement.

The Rhodesia-Katanga Junction Railway is leased to the Rhodesia Railways, Limited, and the Mashonaland Railway Company, under date of the 30th January, 1915, and with effect until the 1st October, 1938. Under this lease these two companies pay a fixed rent of £44,000 a year, a capital expenditure rent of 5½ percent. on additional capital outlay, and a royalty rent of half the net profits from the working of the line. The fixed and capital expenditure rents are included as a trade charge against revenue for the purpose of computing the net profits. Under this lease the Mashonaland Railway Company manages the line.

The only references to rates in this lease are to those granted under special agreements with the Union Minière, the Wankie Colliery, the Belgian Congo Railway Companies and the Rhodesian Broken Hill Mine, and to those to be charged to the Rhodesia-Katanga Company’s mines at Kansanshi and Luana. The Rhodesia and Mashonaland Railway Companies are thus left free to fix rates over these sections, subject to the above special cases.

The Vryburg-Bulawayo section of the Rhodesia Railways is worked by the South African Railways under the original agreement made on the 28th May, 1897, with subsequent modifications. Under this agreement the Rhodesia Railways fix the rates.

Thus the final rate-making authority throughout the system, except for a few special cases, is, in fact, the British South Africa Company, through its ownership of the Mashonaland Railways and the Rhodesia Railways, Limited.

The division of receipts does not affect the question of control, and only affects indirectly that of management. [...] It is only necessary here to mention
that the Rhodesia Railways, Limited, pay £10,000 a year to the Beira Companies to compensate them for the loss of transit dues. By the terms of the Van Laun Concession, under which the Beira Railways were built, these companies were entitled to charge transit dues, not exceeding three per cent. *ad valorem*, on certain goods conveyed between the coast and British territory. These dues handicapped Beira as a port of entry, but the financial situation of the Beira Companies was not strong enough to allow them to abandon the revenue, unless they received assistance. The Rhodesia Railways, Limited, therefore agreed to pay the two companies £10,000 a year as compensation for the suspension of the dues, as from the 1st April, 1920.

The Rhodesia Railways also give to the Beira-Salisbury section twenty per cent. more than its mileage proportion of the receipts from traffic between Beira and points west of Salisbury, in order to compensate the other companies for their heavier operating expenses and the lower rated traffics which they carry. The Kalomo-Broken Hill section of the Mashonaland Railway also gets a special terminal, at the expense of the Rhodesia Railways, on certain traffic. These are merely internal adjustments, by means of which the financially stronger company assists those less fortunately situated. So far as the general standard of rate charges is concerned, their effect is therefore beneficial to the country.

The connection between the British South Africa Company, the Rhodesia Railways Trust and the Beit Railway Trustees has already been explained. It only remains to add that the trustees have also advanced sums of money for the purchase of rolling stock, under hire purchase agreements with the Rhodesia Railways and the Mashonaland Railway Company. The agreement with the Rhodesia Railways has now been terminated by the purchase of the stock by the Rhodesia Railways Trust, who lease it to the Rhodesia Railways as a portion of the stock purchased with the proceeds of six per cent. ten-year joint secured notes. The agreements with the Mashonaland company are still in force.

**POSITION IN PORTUGUESE EAST AFRICA.**

Under the Treaty between the Portuguese and the British Governments, dated the 11th June, 1891, the Portuguese Government agreed to construct a railway line between Pungwe and the British sphere, with docks, quays, etc., at Beira. In terms of the Royal Decrees of the 11th February, 1891, and the 30th July, 1891, the Mozambique Company acquired the right to undertake the work, and under a contract dated the 11th September, 1891, they granted a concession to H. T. van Laun. The British South Africa Company, on the 7th December, 1891, entered into an agreement with Mr. van Laun to acquire his rights under this concession, and in September, 1892, the Beira Railway Company was promoted, to which Mr. van Laun assigned his concessionary rights in January, 1894.
In April, 1895, the Beira Railway Company sub-let part of its rights under the concession to the London and Paris Exploitation Company, Limited, who formed the Beira Junction Railway Company. The latter company constructed, at 2 feet gauge, the first 35½ miles of the line from Beira to Fontesvilla, and the Beira Railway Company the remaining 168½ miles from Fontesvilla to the Rhodesian border.

Under a working agreement dated 15th December, 1896, the Beira Company has the option at the end of thirty years either to renew the working agreement for a further thirty years or to purchase the undertaking of the Beira Junction Company.

The original Van Laun contract has been modified by subsequent agreements and decrees. The principal rights and obligations of the Railway Companies as they stand at the present day, as the result of the original contract and these subsequent modifications, may be stated as follows:–

The Mozambique Company has the right to appoint one-third of the members of the board.

In addition to the original grant of land required for the railway line, stations, docks and quays, the Mozambique Company granted to the companies certain blocks of land along the railway and on alternate sides of it, each five kilometres square. The Beira Company thus acquired 130,673 hectares, and the Beira Junction Company 28,290 hectares, of which they still hold at present 125,592 and 26,856 hectares respectively.

The Mozambique Company will not allow any competing line to be constructed within 100 kilometres of either side of the railway, and the Railways have the preferential right to construct any branch lines from the main railway which may become necessary within the same area.

The Railways have the right to construct and work a telegraph along the line of the railway. / 

The Mozambique Company transferred to the Railway Companies its right to charge a transit due not exceeding three per cent. *ad valorem* on certain goods in transit between the East Coast and the British sphere. Reference has already been made to the suspension of these dues since the 1st April, 1920.

All plant, rolling stock and material required for the construction of the railway and telegraph are to be admitted free of duty.

Under the original contract the tariff of charges for the conveyance of passengers and goods was not allowed to exceed those in force on the Government Railways of the Colony of the Cape of Good Hope; this clause has not been altered, but the Mozambique Company has refrained from exacting its fulfilment on condition that the rates within its territories are subjected for its approval and are not more than those charged to and from points beyond Macqueque, the frontier town.
The dock and quay dues, landing and warehouse charges, have to be approved by the Mozambique Company.

The Railway Companies must convey all officials and employees in the direct service of the Mozambique Company, together with their personal baggage and effects, free of charge, and mail service must be performed gratuitously. Special concessions are also fixed for the carriage of natives for the Mozambique Company, for the carriage of stone for public works at Beira, for the transport of troops, and for telegraph messages for the Portuguese Government and the Mozambique Company.

The Portuguese Government, under the decree of the 11th February, 1891, has the right at the end of twenty-five years, and thereafter at the end of each period of ten years, to modify the concession to the Mozambique Company with regard to, *inter alia*, provisions and clauses relative to the concession of exclusive rights, and can at the same periods acquire works of public interest, such as railways, docks, etc., on payment of an indemnity. The redemption price shall be the capital sum which at five per cent. per annum produces an annual sum equivalent to the average of the net receipts during the previous three years, and that sum may be paid down by the Government, at its choice, or in annual instalments bearing interest at five per cent. There is no condition as to the number or amount of the annual instalments. If the indemnity appears prejudicial to the Government or to the Mozambique Company, the redemption price may be fixed by agreement or by arbitration. If the arbitrators are unable to agree, an umpire shall be appointed by the Portuguese Supreme Tribunal of Justice. The dates for expropriation are 1916, 1926 and so on. This obligation is passed on by the Mozambique Company under the Van Laun contract to the Railway Companies.

Under a decree of the 4th June, 1902, the Portuguese Government laid down that the line, with all its fixed and rolling material, should revert to the State at the end of ninety-nine years. The Railway Company disputes this claim on the grounds that the decree is dated eleven years after the decree granting the concession under which the Van Laun contract was made, and that the legislation is therefore *ex post facto*.2

The above summarises the principal rights and obligations of the two Railway Companies as they stand at present.

In 1923 the Mozambique Company made a contract with the Port of Beira Development Company, under which the latter was to form a Portuguese company called the Port of Beira Company, to construct harbours and port works at Beira and to manage the same. The Mozambique Company agreed not to allow the execution of any work whatever by third parties, unless with the consent of the Port of Beira Company, and to authorise the embarkation and disembarkation of goods only at the wharves or piers of the Port of Beira Company,
apart from installations already legally existing. The right of the Port of Beira Company to pass on its rights and obligations to a contractor was recognised. The British South Africa Company opposed this concession strongly, on the grounds that the Beira Junction Railway Company had the right, under the Van Laun contract, to construct such wharves and piers as were necessary to deal with the traffic passing over its line, which had been constructed in accordance with the terms of the Anglo-Portuguese Convention of 1891, and that therefore the new contract involved a breach of the previous contractual obligations of the Mozambique Company. / 

It is understood that the British South Africa Company is now making arrangements to share in the finance and undertakings of the new companies, the existing assets of the Beira Junction Company connected with port working being merged therein. I have seen the correspondence which has passed between the London Office and the General Manager on this subject, but do not propose to append it to this report, as, at the time of writing, no definite conclusion has been reached. The effect of this new development is discussed later.

**CAPITAL.**

**Rhodesia Railways, Limited.**

Taking first the Rhodesia Railways, Limited, the authorised capital and the capital raised as at the 30th September, 1924, are shown in the following table:–

<table>
<thead>
<tr>
<th>Shares –</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,000 of £1 each</td>
<td>8,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Debentures –</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>With interest at five per cent. per annum</td>
<td>2,000,000</td>
</tr>
<tr>
<td>With interest at four per cent. per annum</td>
<td>3,997,130</td>
</tr>
<tr>
<td>With interest at three per cent. per annum</td>
<td>252,870</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ten-Year Joint Secured Notes –</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhodesia Railways and Rhodesia Railways Trust, £2,000,000 with interest at six per cent. per annum – of which the amount allocated to the Rhodesia Railways is £1,000,000</td>
<td>1,000,000</td>
</tr>
</tbody>
</table>

**Total authorised capital**

£7,258,000
**Capital Raised as at 30th September, 1924.**

*Share Capital Authorised and Issued —*

8,000 shares of £1 each issued as fully paid 8,000

*Debenture Capital Authorised and Issued —*

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five per cent. debentures, issued</td>
<td>... 2,000,000</td>
</tr>
<tr>
<td>Four per cent debentures, issued</td>
<td>£3,996,900</td>
</tr>
<tr>
<td>Less payments in arrear</td>
<td>567</td>
</tr>
<tr>
<td></td>
<td>3,996,333</td>
</tr>
<tr>
<td>Three per cent. debentures, issued</td>
<td>252,870</td>
</tr>
<tr>
<td></td>
<td>6,249,203</td>
</tr>
<tr>
<td>Less five per cent. debentures, redeemed</td>
<td>118,200</td>
</tr>
<tr>
<td></td>
<td>6,131,003</td>
</tr>
</tbody>
</table>

Rhodesia Railways and Rhodesia Railways Trust 10-Year Joint Secured Notes carrying interest at six per cent. per annum, free of income tax, of which the amount allocated to the Rhodesia Railways, Limited, is 1,000,000

Total capital raised 6,139,003

The first point which calls for comment is it that practically the whole of the capital for construction was raised by debentures. The interest on the five per cent issue was guaranteed by the British South Africa Company for twenty years from the 1st November, 1895; that guarantee has now lapsed. The other two debenture issues are guaranteed by the same company as to principal, premium and interest for fifty years from the 1st May, 1899. These onerous conditions explain why the debenture capital forms such a large proportion if it had been possible to raise capital on more favourable terms from the public it may be taken for granted that the owners the British South Africa Company, would have done so, without saddling themselves with these severe obligations. It gains no benefit it has a heavy liability. / The first series of debentures, those issued at five per cent., was secured on the Vryburg-Bulawayo section. For the four per cent. and three per cent. debentures the security given was a first mortgage on the whole line from Bulawayo onwards, and on land grants given in aid of the extension; a second mortgage on the line from Vryburg to Bulawayo and its attached land grants, and a general charge on the whole undertaking and assets of the company, in addition to the British South Africa Company’s guarantees. This illustrates the onerous character of the securities which had to be given in order to raise funds. The first mortgage then given on any future line has seriously hampered the finance of this company; it accounts for the decision to finance the extension of the line from Kalomo to Broken Hill through the agency of the Mashonaland Company, whose future assets were not already pledged.
The total amount of discounts and expenses of issue of the debentures was £264,195 or 4.23 per cent of the nominal value of £6,250,000. The rate of interest on each actually received, 4.47 per cent., is low.

The 10-year six per cent. joint secured notes of the Rhodesia Railways and Rhodesia Railways Trust were issued in 1921; of the total sum of £2,000,000 half was allocated to the Rhodesia Railways. In addition to the mortgage of the debenture holders the Rhodesia Railways had a further liability to the Beit Trust for rolling stock, purchased under hire purchase agreements. With these liabilities it was not possible for that company to raise fresh capital unaided. The Rhodesia Railways Trust therefore joined with the Rhodesia Railways in creating these new notes, for which they are jointly and severally responsible. They are secured generally upon the whole of the undertakings of the two companies, subject to existing prior charges, and specifically upon the rolling stock purchased by the Rhodesia Railways Trust out of its share of the proceeds of the issue. In addition the notes, which are free of income tax, are guaranteed as to principal, premium and interest by the British South Africa Company. The percentage of discounts, stamps and expenses of issue to nominal capital was 7.3; as the notes are free of incomes tax, but it is not possible to state the actual percentage paid on cash received, but it is high, as might be expected, from the date at which the notes were issued.

The discounts on the debentures have already been written off. The discounts and expenses on the note issue are being written off at the rate of £6,567 a year.

To write off the discounts on debentures out of revenue during the life of the debentures is recognised as sound finance. The price at which a debenture is offered to the public and the interest are intimately connected. Assuming a given marketability for the issue, if the price is high the interest must be higher in proportion and vice versa. Consequently, it is only right and sound that the discounts should be gradually written off out of revenue, so that when the time comes to redeem, there is a tangible asset represented on the balance sheet. It is not always possible to do this on account of the financial position of the company, and instances occur in this system where the discounts have been capitalised for this reason. No question can arise as to which is the more correct and sounder course, and no this purpose, provided of course they are not out of proportion and are spaced over a reasonable period. I would mention that the writing off of discounts out revenue is enforced by the Inter-State Commerce Commission of the United States. This body was formed by the United States Government to protect the interests of the public. It regulates, amongst other things, practically every phase of railway finance and rates. It issues detailed instructions as to the precise form of account to be kept, and these have to be obeyed by every railway in the United States. Its decisions, therefore, carry very high authority.
I propose to discuss the subject the subject of the ordinary shares later, when the capital of the Rhodesia Railways Trust, Limited, is under review.

The total capital expenditure on 30th September, 1924, amounted to £8,499,304. For a mileage of 1,396 this is £6,100 a mile, a very low figure.

II
MASHONALAND RAILWAY COMPANY

The situation regarding the capital of the Mashonaland Railway Company is as follows:

**Capital Authorised**

<table>
<thead>
<tr>
<th>Shares –</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>450,000 of £1 each</td>
<td>450,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Debentures –</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>With interest at five per cent. per annum. First series</td>
<td>2,500,000</td>
</tr>
<tr>
<td>With interest at five per cent. per annum. Second series</td>
<td>2,560,000</td>
</tr>
<tr>
<td>Total authorised capital</td>
<td>5,560,000</td>
</tr>
</tbody>
</table>

Same as authorized capital: £5,510,000

**Application Of Capital**

The British Africa Company, under a contract dated the 4th August, 1897, agreed with the Mashonaland Railway Company, Limited:

1. to grant a concession to make and maintain a railway from Umtali to Salisbury, with the first right to construct branches;
2. to provide land grants for the railway;
3. to construct and complete the railway and works;
4. to provide funds for remunerating engineers (£25,000), working capital (£20,000), and payment during construction of interest on debentures issued under the contract;
5. to guarantee interest on an issue of debentures amounting in all to £2,500,000 for twenty-two years from the 1st October, 1897;
6. to hand over £150,000 ‘C’ Beira Railway debentures.

In return the Railway Company issued to the British South Africa Company £449,993 in fully paid shares, and agreed to issue £1,150,000 in debentures (part of the first series of £2,500,000) at eighty per cent of the face value, or higher if the British South African Company required. In the schedules attached to this contract the debentures are treated as being of the value of £80. At the same time
the British South Africa Company assigned to the actual contractors the right to construct and their liabilities under heading (4), handing over as payment their rights in the debentures and 224,000 £1 shares.

A public issue of these debentures was made by the British South Africa Company at ninety, the contractor bearing the expenses of the issue and paying the interest on the debentures during construction. These payments covered the interest for approximately twenty-one months. The contractors may therefore be regarded as obtaining the debentures at a discount of ten per cent., less the expenses mentioned above.

In the Mashonaland Railway Company’s accounts the issue price of these debentures is shown as par. Thus in its case there are no discounts to be written off out of revenue. The discount of £230,000, the difference between the £80 at which they were valued in the contract and par, is included in the capital expenditure.

When this series of transactions was completed the British South Africa Company remained with 225,993 £1 shares in exchange for the concession, the land rights for the railway, £150,000 ‘C’ Beira Railway debentures were estimated three years later in the Mashonaland Railway accounts as being worth £82,500.

The cost to the railway company of getting the line built was £1,374,000 (the debentures plus 224,000 shares); it was approximately 170 miles long so that the cost per mile worked out at £8,082. Considering the easy nature of the country between Umatali and Salisbury and the light character of the construction, this was a high figure at that time. The reason for is not apparent from the evidence obtainable locally.

In 1889 a public issue was made of a further £900,000 debentures of the same series at 95 per cent., £100,000 of which were to provide steel bridges and extra station buildings between Umtali and Salisbury, the balance, viz., £800,000, being for the purpose of enabling the Beira Railway Companies to widen their lines from their original two feet gauge to three feet six inch gauge, and to provide them with £50,000 cash required for other purposes. At the same time, and in connection with these arrangements, £50,000 debentures were also issued to the British South Africa Company at par. In return, the Beira Companies gave the Mashonaland Railway Company a perpetual prior lien rent-charge of £42,500 per annum, non-cumulative and payable out of the net earnings of the railways, and agreed to bear the ten per cent. discount and expenses on the £800,000 debentures issued for their purposes.

£400,000 issued in 1900 at 93 per cent. completed the issue of the first series of debentures of £2,500,000. This last issue was made for improvements to the line, purchase of rolling stock and general purposes.
The debentures of the second series of £2,560,000 were issued in March, 1905, for a variety of purposes, of which the principal were (a) the construction of a line in Northern Rhodesia from Kalomo to the Broken Hill Mine, (b) the acquisition and conversion to standard gauge of a line from Salisbury to the Ayrshire Mine built by the Ayrshire Mining Company and the construction of a branch to the Eldorado Mine, (c) repayment of loans amounting to £350,000, and (d) the provision of interest during construction, and of about £50,000 working capital. The price received by the company for these debentures was 90 per cent. The total discount was accordingly £256,000.

The British South Africa Company gave land grants amounting to about 281 square miles in Northern Rhodesia, covering both land and mineral rights, in connection with the Kalomo-Broken Hill line, and an unconditional guarantee of due payment of capital, interest and premium. The debentures are repayable at par on 1st January, 1955, or earlier at the option of the company at 105 per cent.

So far as the Mashonaland Railway Company accounts are concerned, the discounts may be stated as follows:

### Details of Issue.

<table>
<thead>
<tr>
<th>Nature of issue</th>
<th>Amount (£)</th>
<th>Price per cent.</th>
<th>Amount of discount. (£)</th>
<th>Expenses of issue. (£)</th>
<th>Net amount received (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>£2,50,000 five per cent. Debentures</td>
<td>1,150,000</td>
<td>95</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>100,000</td>
<td>Par 95</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>800,000</td>
<td>Par 93</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>50,000</td>
<td>Par 93</td>
<td>28,825</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>400,000</td>
<td></td>
<td></td>
<td></td>
<td>28,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2,560,000</td>
<td></td>
<td>33,000</td>
<td>28,825</td>
<td>=61,825</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,438,175</td>
</tr>
<tr>
<td>£2,560,000 five per cent. debentures</td>
<td>2,560,000</td>
<td>90</td>
<td>256,000</td>
<td></td>
<td>2,304,000</td>
</tr>
<tr>
<td></td>
<td>5,060,000</td>
<td></td>
<td></td>
<td>317,825</td>
<td>4,742,175</td>
</tr>
</tbody>
</table>
Hammond, Report on the Railway System of Southern Rhodesia

If the first issue of the first series is taken as being issued at eighty, and the discount on the £800,000 issue on behalf of the Beira and Beira Junction Companies is included, the total amount of discounts and expenses becomes £627,825, and bears a percentage of 12.4 to the nominal amount of debentures. On the same basis the percentage of interest paid on cash or value received is 5.7. It is not possible to draw any just comparisons with these figures, however, as so much of the capital is represented by value and not cash received. The discounts are being written off at the rate of £5,250 per annum, which cannot be regarded as a heavy burden.

The expenditure on capital account amounted at 30th September, 1924, to £4,432,142 for 607 miles; this figure excludes the expenditure in connection with the widening of the Beira Railways. If allowance is made for the Beira Railway / debentures held, this works out at approximately £7,160 a mile over the whole system. As this includes the original cost of the Umatali-Salisbury section and of improvements and additional equipment since, it shows that the cost of constructing the remainder was considerable lower than that of building the first section. This final result of £7,160 can be called a very moderate figure.

As in the case of the Rhodesia Railways, the proportion of debentures to total capital is most marked, but as the British South Africa Company guaranteed the interest on all these issues also, the reason for this must again be sought in the difficulty of raising capital otherwise.

**RHODESIA RAILWAYS TRUST.**

The Rhodesia Railways Trust is a financial company; its present share capital is as follows:–

<table>
<thead>
<tr>
<th>Share Capital</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Authorised</strong> –</td>
<td>3,000,000 shares of £1 each</td>
</tr>
<tr>
<td><strong>Issued</strong> –</td>
<td>2,057,67 shares of each, fully paid</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Joint Secured Notes.</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Authorised</strong> –</td>
<td>£2,00,000 Rhodesia, Railways, Limited, and Rhodesia Railways Trust, Limited, 10-years Joint Second Notes, carrying interest at six per cent. free of income tax, of which the amount allocated to the Rhodesia Railways Trust is</td>
</tr>
<tr>
<td><strong>Issued</strong> –</td>
<td>As authorized</td>
</tr>
</tbody>
</table>
The situation regarding share capital is explained by the Railway Authorities in the Financial History of the Trust, Appendix III., in following terms:

‘The Rhodesia Railways Trust, Limited, was formed in June, 1899, with a share capital of £1,000,000 in £1 shares, having for its object the amalgamation of the interests of the shareholders in the Rhodesia Railways, Limited, and in the Mashonaland Railway Company, Limited.

At this time the share capital of the Rhodesia Railways, Limited, was 8,000 shares of £1 each, of which the British South Africa Company held 4,000, and of the Mashonaland Railway Company, Limited, 450,000 shares of £1 each, of which the British South Africa Company held 226,000. At this date, therefore, the British South Africa Company held one-half of the share capital of each of the Railway Companies.

Discussions took place between the British South Africa Company and those representing the interests of the outside shareholders of the Rhodesia and Mashonaland Railway companies, and terms were arranged on which practically the whole of the share capital of both the Railway companies should be acquired by the Rhodesia Railways Trust in exchange for shares. These terms were that 71 Rhodesia Railways Trust share of £1 each should be issued in exchange for each Rhodesia Railways share and five-eighths of a Rhodesia Railways Trust share for each Mashonaland Railway share.

It may be noted that the share capital of the Rhodesia Railways, Limited, viz., £8,000, does not and never was intended to bear any relation whatever to the actual value of the undertaking. It was merely a figure chosen for convenience of definition of interests, which were in very few hands.

The exchange of shares has resulted to date as follows:

567,219 Shares of £1 each issued as fully-paid in the Rhodesia Railways Trust, Limited, in exchange for 7,989 shares of £1 fully-paid in the Rhodesia Railways, Limited.
280,922 Shares of £1 each issued as fully-paid in the Rhodesia Railways Trust, Limited, in exchange for 499,475 1/5 shares of £1 each fully-paid in the Mashonaland Railway Company, Limited.

Of the shares capitals of the number of shares not acquired by the Rhodesia Railways Trust, Limited, at 31st March, 1924, are as under:

<table>
<thead>
<tr>
<th>No of Shares</th>
<th>Rhodesia Railways, Limited</th>
<th>Mashonaland Railway Company, Limited</th>
</tr>
</thead>
</table>

From the inception of the Rhodesia Railways, Limited, and the Mashonaland Railways Company, Limited, the British South Africa Company made advances to the two companies, on open account without any security (1) to enable the companies to meet their debenture interest, and (2) to provide funds for capi-
In November, 1910, the Rhodesia Railways Trust, Limited, agreed with the British South Africa Company to create a further 2,000,000 shares and to give to the British South Africa Company an option to call upon the Trust to take over from the British South Africa Company the debts due to that company on account of advances made to the Rhodesia Railways Limited, and the Mashonaland Railway Company, Limited, and to allot to the British South Africa Company fully-paid shares at par in respect of the amount of such debts so taken over. The British South Africa Company further undertook to subscribe in cash for 25,000 Trust shares at par in order to provide a small working capital and the liquidation of current liabilities.

The British South Africa Company in 1911 exercised its option under the above arrangement, and 1,131,888 shares in the Rhodesia Railways Trust, Limited, were issued to them at par as the purchase price for debts due by the two Railway Companies in accordance with the following:

<table>
<thead>
<tr>
<th>Shares</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>570,024 Shares of £1 each issued as fully-paid for the purchase of the debt due from the Rhodesia Railways, Limited</td>
<td>£570,024</td>
</tr>
<tr>
<td>561,864 Shares of £1 each issued as fully-paid for the purchase of the debt due from the Mashonaland Railway Company, Limited</td>
<td>£561,864</td>
</tr>
<tr>
<td><strong>1,131,888</strong></td>
<td><strong>£1,131,888</strong></td>
</tr>
</tbody>
</table>

These arrangements did not affect the position of the Railway Companies, but only changed their creditors.

Since 1911 the Rhodesia Railways Trust has provided further financial assistance to the two Railways in order that progress should not be arrested by the want of capital to provide proper facilities and the equipment required for their important undertakings.

The following is the position of the capital account of the Rhodesia Railways Trust, Limited, as at the 31st March, 1924:

### Share Capital.

- **Authorised**: 3,000,000 shares of £1 each
  - ... £3,000,000
- **Issued**: 2,005,767 shares of £1 each, fully-paid
  - ... 2,005,767

#### Analysis of issues –

1. Against cash or its equivalent –
   - (a) Cash
     - ... £25,738
   - (b) Purchase of debts –
     - (1) Rhodesia Railways, Limited
       - £570,024
     - (2) Mashonaland Railway Company, Ltd
       - 561,864

**£1,131,888**
Communications in Africa, 1880–1939: Volume 3

2. Purchase of shares –
   (a) Rhodesia Railways, Limited ... 567,219
   (b) Mashonaland Railway Co., Ltd. ... 280,922

1,157,626

848,141

£2,005,767

'It will be evident from these figures that the issued share capital of the Rhodesia Railways Trust, Limited, represents the combined share capital of the Rhodesia Railways, Limited, and of the Mashonaland Railway Company, Limited; and that such dividends as are paid upon its shares measure the return received by the proprietors of the system upon their capital.

It has been frequently stated in Rhodesia that the greater portion of this capital is paper, or water, and that the two railways have received no corresponding benefit from its issue. In many quarters it is regarded as bonus shares paid to promoters. Even if it were so, it would be quiet reasonable and in keeping with the usual practice that the promoters of a system of railways of the magnitude of those serving Rhodesia and neighbouring territories should receive some recognition for their conception, work and risk; but, in the present case, it can be clearly shown that the Railway Companies have received good value for every Rhodesia Railways Trust share issued.

As regards the 1,157,626 shares issued for cash or its equivalent, amounting to £1,157,626, no question can arise. The whole of this sum is represented by cash which has been provided and expended for railway purposes, and from this point of view such minor portion of the total as represents accrued interest must obviously be equally regarded as money lent for railway purposes by the persons to whom it was due.

As regards the balance of £848,141 shares, the two Railway Companies have received the following benefits from the British South Africa Company:–

(a) Concessions which enabled the Railway Companies to build or acquire 1,994 miles of railways, with the necessary land.
(b) Land grants, carrying mineral rights: 8,000 square miles in Bechuanaland; 1,062 square miles in Rhodesia.

Note. – The revenue derived from the sale of land, leases, mineral royalties, etc., to the 30th September, 1924, has been approximately £210,000. The area of the land unsold at 30th September, 1924, was approximately 3,046,000 acres, which, at a conservative valuation, with the mineral royalties, may be put at £460,000, thus making a total estimated value of the land grants £670,000.

(c) Financial. – Guarantees in respect of debenture issues of the Railway Companies involving a liability on:
1. Interest account of £19,523,550.
2. Capital account of £6,810,000.

These guarantees enabled the two Railway Companies to raise:–
£252,870 at 3 per cent.
£3,997,130 at 4 per cent.
£5,060,000 at 5 per cent.

and without such guarantees the rate of interest, and therefore the annual interest charged, would have been appreciably higher.

The onerous character of these guarantees is shown by the fact that, out of its own general funds the British South Africa Company had at the 30th September, 1909, provided on open account and without any security whatever as much as £1,011,580 under such guarantees and for other purposes.

(d) Subsidies paid to the Rhodesia Railways, Limited, by the British South Africa Company in cash to an amount of £100,000.

(e) £150,000 ‘C’ debentures in the Beira Railway Company, Limited, which have been exchanged for £105,000 4½ per cent. debentures and £71,250 six per cent. income debenture stock.'

The public interest in the matter lies in whether or not the capital of the company has been watered, and centres chiefly on the price paid for Rhodesia Railway shares, namely, 71 £1 shares in the Trust for each Rhodesia Railway share.

The whole of the 8,000 £1 ordinary shares of the Rhodesia Railway Limited, were issued to the British South Africa Company in two distinct transactions. The total considerations given in exchange were:–

(a) Concessions which enabled the Company to build or acquire 1,396 miles of railway.

(b) Land grants, with mineral rights, of 8,000 square miles in Bechuanaland and 801 square miles in Rhodesia.

On the basis of estimation taken above the present value of these grants is approximately £655,000.

(c) Subsidies in cash to an amount of £100,000.

(d) Guarantees of interest on debenture issues of £6,250,000, and of capital and premium on £3,250,000.

It is quite clear, therefore, that these shares were of purely nominal value; the value of the cash subsidy alone was over twelve times the par value of the shares. It would be difficult to estimate the value of the land grants at the time of the formation of the Trust; the value of the guarantees to the Railway Company would be even more difficult to assess.

In the case of the Mashonaland Company, the total benefits given by the British South Africa Company were:–
(a) The concessions which have enabled the Company to build or acquire 607 miles of railway.

(b) Land grants, with mineral rights, of 281 square miles in Northern Rhodesia, which, on the same basis of valuation, are now approximately £15,000.

(c) £150,000 ‘C’ debentures of the Beira Railway Company, valued at about the same date by the Railway Company in its own accounts at £82,500.

(d) Guarantees of interest on debenture issues of £5,060,000, and of capital and premium on £2,560,000.

In return they received 225,993 £1 shares, the remaining 224,000 shares having been given to the contractors as part consideration for the building of the line. These shares were equivalent on exchange to 141,246 £1 shares in the Trust; deducting the value of the debentures this leaves 58,746 £1 shares in the Trust to set off against the considerations detailed under the headings (a), (b) and (d).

An important point to note is that at the time of the formation of the Trust 4,000 of the Rhodesia Railway shares and approximately 224,000 of the Mashonaland Railway shares were in other hands than those of the British South Africa Company, and that practically the whole of these outside shareholders exchanged into the new Trust, showing that they at any rate were satisfied with the assessment as between the two Companies.

The British South Africa Company also itself, ten years later, exchanged debts of the two Companies bearing interest at five per cent. for shares of the Trust at par, and in view of the British South Africa Company’s guarantees of interest on debentures, these debts could certainly be classed as good ones. Further, it subscribed for 25,000 shares at par.

These facts tend to show that not only was the assessment as between the two Companies considered fair by those most directly concerned, but that the values themselves were reasonable.

I am of opinion that full and adequate considerations were given by the British South Africa Company in return for the shares which it received in the Trust, and that the shares of the latter cannot in justice be considered as having been in any way ‘watered.’

I have already explained, when dealing with the Rhodesia Railways, Limited, the terms of the joint secured notes. The only points which it remains to add are that, for hire of the rolling stock purchased by the Trust out of its share of the notes, the Rhodesia Railway has only to pay an annual charge equal to six per cent., free of income tax, on that share, so that the Trust makes no profit on the rental of the rolling stock or the use of the money.
BEIRA COMPANY.

The issue and application of the capital of the Beira Railway Company* were complicated. They are thus described by the Railway Authorities in the Financial History, Appendix IV.:–

The Beira Railway Company, Limited, is peculiar in that the liability of its shareholders is limited by guarantee. It accordingly issued no share capital for cash. The members of the Company are entitled to the net profits. In order to determine the relative proportions of the interests of the members, the Company is deemed to be divided into 600,000 shares, and members are deemed to be interested in the Company in proportion to the number of such shares registered in their names. The members are liable for the capital of the Company, which consists of the amounts (not exceeding £1 per member irrespective of the number of shares held) which may be required of the members in the event of the Company being wound up during their membership, or within one year afterwards.

CAPITAL.

Authorised: 600,000 shares (no value expressed).

Issued: 295,000 to the Mozambique Company in part payment for the concession to build the railway.

305,000 (to bearer) were offered as a bonus to subscribers of the ‘A’ debentures at the rate of twenty shares for every £20 of debentures. The voting power in respect of these shares is vested in the British South Africa Company in trust until the 1st July, 1942.

ORIGINAL DEBENTURE CAPITAL.

<table>
<thead>
<tr>
<th>Authorised</th>
<th>Issued</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£</td>
</tr>
<tr>
<td>Created 1892. Series ‘A,’ 6 per cent.</td>
<td>250,000</td>
</tr>
<tr>
<td>Created 1894. Series ‘B,’ 6 per cent.</td>
<td>250,000</td>
</tr>
<tr>
<td>Created 1896. Series ‘C,’ 6 per cent.</td>
<td>600,000</td>
</tr>
<tr>
<td></td>
<td>£1,100,000</td>
</tr>
</tbody>
</table>

All three series of debentures were redeemable at par on the 30th June, 1922, or earlier at the option of the Company at £110 per cent. Interest was funded for three years and then paid in cash, with the exception of £9,856, which was liquidated by an issue of ‘C’ debentures at par.

* Appendices IV. and VI.
The above debentures were issued mainly for the purpose of providing funds for the construction of the original 2 feet gauge line, and for rolling stock, plant and equipment.

The discounts and expenses of issue of these debentures were as follows:–

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total nominal amount of debentures</td>
<td>£1,099,046</td>
</tr>
<tr>
<td>Less: discounts</td>
<td>£214,820</td>
</tr>
<tr>
<td>Expenses of issue, including stamps</td>
<td>£13,402</td>
</tr>
<tr>
<td><strong>Net amount</strong></td>
<td><strong>£870,824</strong></td>
</tr>
</tbody>
</table>

Cost of discounts and expenses of issue to nominal amount of debentures ... 20.8 per cent.

It may be stated that a considerable portion of the authorized issue of series ‘A,’ ‘B’ and ‘C’ debentures were issued to the contractors at par, or at a discount, in connection with the construction of the line.

**Conversion of 6 per cent. Debentures.**

In July, 1900, the debenture holders approved a scheme for the exchange of the three series of the 6 per cent. debentures for 4½ per cent. debentures and 6 per cent. non-cumulative income debenture stock, with a sinking fund of £½ per cent., for the redemption of the debentures, to be provided out of each year’s net profits, in the following proportions:–

<table>
<thead>
<tr>
<th>Series</th>
<th>4½% Debentures</th>
<th>6% Debenture stock</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td></td>
<td>s. d.</td>
<td>s. d.</td>
</tr>
<tr>
<td>Series ‘A’</td>
<td>32 10 0</td>
<td>90 32 10 0</td>
</tr>
<tr>
<td>Series ‘B’</td>
<td>43 15 0</td>
<td>75 43 15 0</td>
</tr>
<tr>
<td>Series ‘C’</td>
<td>47 10 0</td>
<td>70 47 10 0</td>
</tr>
</tbody>
</table>

At the same time the debenture holders of the Beira Junction Railway Company were invited to exchange their bonds for the new 4½ per cent. debentures and 6 per cent. income debenture stock of the Beira Company, sufficient capital having been created for the purpose. Almost all the Beira Junction debenture holders took advantage of this offer, and the Beira Railway Company held, at 30th September, 1924, £249,821 12s. 1d. of the £249,959 6s. 6d. debentures of the Beira Junction Company. The basis of exchange was £60 of the 4½ per cent. debentures, and £55 of the Income Debenture Stock for each £100 debenture of the Beira Junction Company.

The new 4½ per cent. debentures are redeemable on 31st December, 1926, and are secured by deeds which provide for the creation of a sinking fund for their redemption. The redemption price was originally at par, but was increased
to £103 per cent. under the arrangement for the redemption of the rent charge, to which reference will be made later on. The income debenture stock is redeemable at par at the option of the Company on giving six months’ notice, expiring after the 31st December, 1926.

The main features in the conversion scheme were (1) the holders of the 6 per cent. debentures of the Beira and Beira Junction Companies were allotted in exchange sufficient of the new 4½ per cent. debentures and the 6 per cent. income debenture stock as would give them a return on their new capital equal to what they previously received, assuming that the interest on the 6 per cent. income debenture stock was regularly paid, which has not been the case; (2) that although the total interest charge remained the same, the annual debenture interest charge upon the Company was reduced from £65,943 to £37,431; and (3) to provide additional capital for purposes of the undertaking.

The nominal addition to capital, viz., £207,947, consequent upon the carrying out of the conversion scheme, has been charged to capital account in terms of the Beira Railway Act, 1914. The following particulars will show how this amount was arrived at:–

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of 4½ per cent. debentures</td>
<td>831,789</td>
</tr>
<tr>
<td>And 6 per cent. income debenture stock</td>
<td>475,204</td>
</tr>
<tr>
<td>Issued or to be issued in exchange for original 6 per cent. debentures</td>
<td>1,099,046</td>
</tr>
<tr>
<td>Nominal addition</td>
<td>£207,947</td>
</tr>
</tbody>
</table>

Note. – £84 0s. 11d. of the 6 per cent. debentures not converted at 30th September, 1924.

Under the conversion scheme the new authorized capital of the Company is as follows:–

<table>
<thead>
<tr>
<th>Type of Debentures</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>4½ per cent. debentures</td>
<td>£1,100,000</td>
</tr>
<tr>
<td>6 per cent. non-cumulative income debenture stock</td>
<td>613,125</td>
</tr>
</tbody>
</table>

which has been disposed of as under:–

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>In exchange for 1,098,962 6 per cent. debentures, series ‘A’, ‘B’ and ‘C’</td>
<td>831,718</td>
<td>475,173</td>
</tr>
<tr>
<td>In exchange or £239,792 6 per cent. debentures, Beira Junction Railway Company, Limited</td>
<td>143,875</td>
<td>131,885</td>
</tr>
<tr>
<td>Sold for cash</td>
<td>123,000</td>
<td>5,500</td>
</tr>
</tbody>
</table>
Fractional differences

\[
\begin{array}{c|c|c}
\text{Less: 4½ per cent. debentures redeemed to 30th September, 1924} & 1,098,593 & 612,558 \\
18 & 17 & \\
1,098,611 & 612,575 & \\
64,880 & \\
\text{Existing at 30th September, 1924} & \£1,033,731 & \£612,575 \\
\end{array}
\]

The discount and expenses on the £123,000 4½ per cent. debentures and the £5,500 income debenture stock sold for cash, amounted to £13,586 or 10.6 per cent. on the nominal amount.

**Prior Line Rent Charge.**

In addition to the 4½ per cent. debentures and the 6 per cent. Income debenture stock, the Beira Railway Company has a further capital liability in respect of the debentures issued by the Mashonaland Railway for widening the gauge of the Beira line, improvements to the line, and for other purposes.

Reference has already been made in the memorandum relating to the Mashonaland Railway Company to the fact that the funds for these purposes were raised by the two Beira Companies creating a prior lien charge of £42,500 a year in favour of the Mashonaland Railway Company, of which the Beira Railway Company’s proportion is £35,099 9s. 10d., and the Beira Junction Railway Company’s £7,400 10s. 2d.

This rent-charge was originally irredeemable except in certain contingencies, when it became capitalised at £850,000, of which the Beira Railway Company’s proportion in respect of its line from Fontesvilla to Umtali is £701,990, the balance being a charge against the Beira Junction Railway Company. This rent-charge is now redeemable, and the two Beira Companies have undertaken to make a provision of £8,500 per annum out of the net earnings after the following charges have been met:— The annual prior lien rent-charge, the annual debenture interest, the existing sinking fund of £5,500 per annum and the interest on the income debenture stock. The Mashonaland Railway Company has undertaken to use the amount of £8,500 in the redemption of its own debentures, together with such portion of the annual prior lien rent-charge of £42,500 as will (after the first payment for redemption) be equal to the interest on the amount of debentures already redeemed. It is estimated that these annual redemptions will redeem the £850,000 debentures in a period under forty years.

The Beira Railway Company’s proportion of the annual provision referred to is £7,020. Up to the 30th September, 1924, the total amount provided towards the redemption of the prior lien rent-charge was £44,002 7s. 7d.
**Discounts and Expenses of Issue on Debenture and Income Debenture Capital and on Capital Funds obtained from the Mashonaland Railway Company, Limited, for the widening of the line and other purposes.**

As the original 6 per cent. debentures of the Beira Railway Company, Limited, have been exchanged for 4½ per cent. debentures and 6 per cent. income debenture stock, the discounts and expenses of issue on the existing capital funds of the Company may be stated as follows:– /

<table>
<thead>
<tr>
<th>Existing capital funds.</th>
<th>Discount and expenses of issue</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>£</strong></td>
<td></td>
</tr>
<tr>
<td>4½% Debentures</td>
<td></td>
</tr>
<tr>
<td>975,611</td>
<td>228,222</td>
</tr>
<tr>
<td>6% Income debenture stock</td>
<td></td>
</tr>
<tr>
<td>607,075</td>
<td></td>
</tr>
<tr>
<td>4½% Debentures</td>
<td></td>
</tr>
<tr>
<td>123,000</td>
<td>13,586</td>
</tr>
<tr>
<td>5% Debenture stock</td>
<td></td>
</tr>
<tr>
<td>5,500</td>
<td>65,199</td>
</tr>
<tr>
<td>5% Debentures of Mashonaland Railway Company, Ltd.</td>
<td></td>
</tr>
<tr>
<td>701,990</td>
<td></td>
</tr>
<tr>
<td><strong>£2,413,176</strong></td>
<td><strong>£307,007</strong></td>
</tr>
</tbody>
</table>

Nominal amount of debentures and income debenture stock of the Beira Railway Company, Limited, also the Mashonaland Railway 5 per cent. debentures, the proceeds of which were advanced to the Beira Railway Company, Limited, for widening line and other purposes £2,413,176

Total amount of discounts and expenses of issue connected with the above 307,007

Net amount £2,106,169

Percentage of discount and expense of issue to nominal amount of debentures 12.7 per cent.
‘Redemption of Debentures.

‘The 4½ per cent. debentures of the Company are redeemable on 31st December, 1926, at £103 per cent., and are secured by deeds which provide for the creation of a sinking fund of ½ per cent. for redemption purposes, to be provided out of each year’s net profits. Owing to no net profits being available, it was not possible in many years to contribute towards the sinking fund. It will be seen from particulars furnished in Schedule ‘C’ that at the 30th September, 1924, the contributions to the sinking fund amounted to £66,000 4s., and out of this sum debentures of the face value of £64,880 had been redeemed.

Consequent upon the agreement arrived at with the Mashonaland Railway Company in regard to redemption of the prior lien rent-charge by gradual payments, arrangements were approved by the Trustees and debenture holders of the 4½ per cent. debenture issue for the creation of an additional sinking fund for the redemption of Beira Railway 4½ per cent. debentures. This additional sinking fund has to be provided out of the net earnings of the Company after the following charges have been met:– The prior lien rent-charge, the annual debenture interest, the existing sinking fund of £5,500 a year, the interest on the income debenture stock, and the sum of £7,020 a year for the redemption of the capital liability attaching to the rent-charge. This additional fund is to be equal to 55 per cent. of the amount available to be paid in any one year as dividends to the shareholders, with the following limitation:– The total sum to be set aside for the additional sinking fund, plus the sinking fund of £5,500, plus the £7,020 paid to the Mashonaland Railway Company in redemption of the prior lien rent-charge, shall not in any one year exceed £50,000, that is to say, the maximum amount of the additional sinking fund for 4½ per cent. debentures cannot exceed £37,480 in any one year.

No payments to the additional sinking fund have been made to 30th September, 1924.

Act of 1914 to empower the Beira Railway Company to make Adjustments in its Accounts and for other Purposes.

In 1914 the sanction of Parliament was sought and obtained to rectify the balance sheet of the Company by increasing the value of the assets of the Company by £852,754 19s. 8d. as follows:–
Hammond, Report on the Railway System of Southern Rhodesia

AMOUNTS ELIMINATED FROM THE BALANCE SHEET.

Items formerly included under the heading of Permanent Way, Telegraph Stations, etc., and cost of widening line:–

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
<th>s</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discount on Company’s debentures</td>
<td>52,500</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Discount on debentures of the Mashonaland Railway Company, Limited</td>
<td>60,681</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>113,181</td>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>

Items formerly appearing under separate headings:–

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
<th>s</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary expenses</td>
<td>1,197</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Discount and stamps on debentures and discount on income debenture stock</td>
<td>79,698</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Interest on debentures during construction and working of line</td>
<td>137,076</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Nominal additions on conversion of 6 per cent. debentures into 4½ per cent. income debenture stock</td>
<td>207,947</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Less proceeds of sale of bearer certificates the British South Africa Company representing shares in the Beira Railway Company</td>
<td>36,069</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>171,877</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Loss on sales of narrow gauge rolling stock and stores</td>
<td>112,126</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td>Balance of debit of profit and loss account at 1st October, 1912...</td>
<td>290,319</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Less profit for year ended 30th September, 1913</td>
<td>52,723</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>237,596</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>£852,754</td>
<td>19</td>
<td>8</td>
</tr>
</tbody>
</table>

Clause 3 (1c) of the Act also sanctions the retention in the account of the permanent way, telegraph stations, etc., and cost of widening the line; the whole cost, as included therein, of the construction work upon the original narrow gauge railway of the Beira Company.

What, in effect, Parliament was asked to say was that the expenditure upon the narrow gauge railway, the cost of its conversion to 3 feet 6 inch gauge, cost of raising the necessary funds connected therewith, also the losses made during the earlier years, though not represented by tangible physical assets, were, in fact, necessary elements in making good and proving the value of the concession and railway, and could be rightly included as part of the cost of the undertaking.

A precedent for the Beira Railway Act, 1914, is to be found in the case of the Metropolitan District Railway Company who, by a special Act of Parliament, were empowered to carry to their capital account not only all the cost
of electrification, but also all the losses during electrification until a profit could be obtained.’

It will be noticed that the discounts in the first issue of debentures were high, being about twenty per cent. Many of the debentures were issued to the contractors at 60 and 65. The rate of interest was six per cent. as compared with five per cent. on the Rhodesia Railway debentures, which were issued at about the same time.

The best test in this case is, I think, the capital cost as recorded in the Company's accounts, and the interest charge thereon. The original cost of constructing and equipping the 168½ miles from Fontesvilla to Umtali was approximately £1,023,000, or £6,070 a mile, and the interest charge approximately £61,400, or £364 a mile. The climb on to the main plateau entailed much heavier work than is to be found anywhere else on the system. The difficulties which were encountered during construction, owing to disease and the unexplored and unhealthy nature of the country, are a matter of common knowledge. Added to this was the difficulty of getting capital for a line in the colony of a foreign power, of which little was known. Bearing in mind these handicaps, I do not consider, despite the high rate of discount, that the original cost per mile or the interest charges were excessive.

The decision to widen the gauge of the line from 2 feet to 3 feet 6 inches was taken very shortly after the line was completed to Umtali. It may now appear strange that the line was not built to the larger gauge in the first place. It must be remembered, however, that the Beira line was commenced before the Bechuanaland Railway Company, the forerunner of the Rhodesian Railways, was even incorporated. Everything points to the fact that it was projected merely to give access to the new countries from the eastern coast, without any thought of ultimately linking it with a line starting from the Cape Colony system. It took much longer to build than the western line and, in the meantime, the situation had developed very rapidly. The trend of political affairs appears also to have altered materially.

I have come across nothing in my investigation which tends to show that the original decision was taken in anything but good faith. If it is called an error of judgment, it was one against which even the far-sighted vision of Mr. Rhodes was not proof, and the debenture holders have paid largely for the mistake, as only for a few years did they receive the equivalent of the full interest on the original debentures.

This widening naturally added considerably to the capital cost, but despite this disadvantage the cost per mile was still only slightly higher than £8,100. In view of the particular circumstances this was not excessive.

As regards the Beira Railway Act of 1914, all the items, with the exception of the nominal additions to capital, the loss on sale of narrow gauge rolling stock
and the debit on profit and loss account, already before the passing of the Act appeared in the capital account. It should be noted that in this case a different line was adopted in relation to discounts; nothing has been written off against them out of revenue. As it happens, it would have made no practical difference up to the time of the Act which course was adopted, as if the discounts had been written off partially out of revenue the only result would have been to swell the debit on the profit and loss account.

The item of £207,947 for nominal additions on conversion of debentures was a necessary consequence of the conversion, and no exception can be taken to it. It entailed no increase in interest charges; on the contrary, under the scheme the debenture holders could never get more interest than they did before, and could and did get considerably less.

In respect of the item for capitalising the losses on working, the Railway Authorities have quoted a precedent. The bulk of the items, as stated above, already figured in the capital account; the Act merely regularised them and moved them, so to speak, from one place in the balance sheet to another. Though no fresh capital issue was entailed, the transaction practically absorbed any balance standing to the credit of the capital account.

The net result of the operations under this Act was to allow the Company to include in its balance sheet several items of expenditure for which there were no tangible assets.

The capital cost of the railway, including these adjustments, stood in the accounts of the Company on the 30th September, 1924, at £2,240,469, or £13,297 a mile, which, for a railway of this standard, is very high. The capital, including the capitalised value of the prior lien rent-charge but excluding the debentures issued in exchange for Beira Junction Railway debentures, stood at 30th September, 1924, at £2,072,638, or £12,300 a mile.

As explained earlier, considering the difficulties, the capital expenditure was not excessive until after the passage of the Beira Railway Act. The principal causes, therefore, for the heavy capitalisation of the railway are the losses incurred during the earlier years of working and the consequent embarrassed financial situation of the Company, who was thus forced to place against capital items which, under happier circumstances, would have been recovered out of revenue. There is no evidence that this was due to mismanagement; it seems rather to have been due to want of traffic.

Three funds for redemption of capital exist. The first in priority is for the redemption of the 4½ per cent. debentures, at the rate of £5,500 a year; the instalments for the past four years have been paid, but there was a break of four years before that when nothing was paid. The second is for the redemption of the prior lien rent-charge; this is at the rate of £7,020 a year. No allocation on this
account was made until the year 1923–1924, when, in addition to the current charge, £36,982 was allotted on account of arrears. The third is for additional redemption of the 4½ per cent. debentures; no payment has yet been made to this fund. Up to date the total sums allotted to redemption of capital amount to approximately £110,000.

The ordinary shares of the Company are certainly peculiar; they are not represented by any asset. They may be regarded as merely an arrangement for sharing the surplus profits of the Company; so far there have not been any. In so far as they are unrepresented by any asset, they may be regarded as ‘water’; but, on the other hand, the 295,000 issued to the Mozambique Company were an obligation, and the remaining 305,000 were given to subscribers to the ‘A’ debentures, as an additional inducement to subscribe.

**BEIRA JUNCTION RAILWAY.**

The capital of the Beira Junction Railway* is as follows:–

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Amount</td>
</tr>
<tr>
<td></td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td>Ordinary Shares to bearer of 5s. each</td>
<td>250,000</td>
<td>62,500</td>
</tr>
<tr>
<td>6 per cent. Cumulative Preference Shares of 5s. each</td>
<td>500,000</td>
<td>125,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Debentures.</th>
<th>Authorised.</th>
<th>Issued.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td>In 1895 6 per cent.</td>
<td>250,000</td>
<td>249,959</td>
</tr>
<tr>
<td>In 1915 5 per cent.</td>
<td>200,000</td>
<td>121,300</td>
</tr>
</tbody>
</table>

The £249,959 six per cent. debentures were issued at a discount of £96,777, or about 38¾ per cent. This is an extremely high rate of discount, even higher than for the Beira Railway, although the rate of interest was the same. The reason for this is not apparent; the original contracts are not available in this country.

Here, as in the case of the Beira Railway, the best test is the actual cost to the Company of constructing the railway. The original cost of the 2 feet line, including interest on debentures during construction, was approximately £215,400, or

* Appendices V and VI
about £6,070 a mile for the 35½ mile length. This is practically the same rate as for the Beira line. The difficulties of the unhealthy country were worse in this case but, on the other hand, the actual construction was easier. / For a line over easy country the figure quoted is on the high side, but it looks as though a general price had been fixed to cover both railways, although there is no direct evidence on this point. On this assumption a general figure of £6,070 per mile for the whole distance from Beira to Umtali is not excessive.

All but £138 of these debentures are now held by the Beira Railway, under the exchange agreement already mentioned when dealing with the capital of that Company. They are due for redemption on 1st July, 1925, at par; presumably they will be renewed on the present terms. With the exception of £2,649, paid in 1900, the discounts on this issue have been capitalised.

The issue of £121,300 five per cent. debentures was made in 1915, to meet the following liabilities:–

(1) Arrears of interest to the Beira Railway Company on six per cent. debentures from 1st January, 1907, to 30th September, 1911, £67,300.

(2) Repayment to Mashonaland Company of sums advanced to meet capital expenditure, £54,000.

While no comment is necessary on the second item, the first transaction was for the purpose of financing past losses. A different course was pursued to that adopted by the Beira Railway Company, but, as in that case, the financial difficulties do not appear to have been due to mismanagement, but rather to want of traffic. Here a new issue was made to cover the deficiency, and a further fixed charge placed on the revenues of the Company. The interest on the five per cent. debentures was, in turn, in arrears on the 30th September, 1924, to the extent of £35,404. There was no discount on these debentures.

Besides these debentures, the Beira Junction Railway Company has a further capital liability in respect of the prior lien rent charge, on account of widening, which was fully explained when dealing with the Beira Railway Company. The Beira Junction Company’s share of the capital liability is £148,010, and the annual rent charge is £7,400 10s. 0d. To the redemption of this liability the Beira Junction Railway Company should allot £1,480 a year out of net profits, before paying interest on the five per cent. debentures; the arrears on this redemption charge were made good during the last financial year, and £14,801 in all has been allotted to this account. The discount of £14,801 on the five per cent. debentures of the Mashonaland Railway Company, raised for the purpose of widening, has been capitalised.

The 423,583 six per cent. cumulative preference shares of five shillings each were subscribed for in cash by the British South Africa Company to provide funds for the construction of a pier at Beira, usually known as the B.C.C. pier. This pier was never completed and has been abandoned. Some of the material
has been sold. No interest has ever been paid on these shares; so far as the British South Africa Company is concerned, the money thus subscribed has up to date been a dead loss, except in so far as it ensures them control of the Company.

The capital expenditure on the railway and wharves, excluding the special expenditure on the B.C.C. pier and a special item of cost of concession, to which reference is made later, amounted on the 30th September, 1924, to approximately £543,000, or about £15,300 a mile. Of this, approximately £191,100 has been spent on improvements to the line, or an average of £5,383 per mile. The bulk of this has been expended on the provision of lighter wharves at Beira, the reclamation of ground and the provision of railway facilities in connection therewith. As the railway itself is so short, only 35½ miles long, this expenditure naturally works out at a very high figure per mile. The remainder of the capital expenditure is represented by the charge of £148,000 for widening, and I have already dealt with this question when reviewing the capital of the Beira Railway. Thus, though the figure of £15,300 per mile is undoubtedly very high for a railway of this standard, there are special circumstances which, to a certain extent, account for it.

The fixed interest charges, including the prior lien rent charge, amount to £28,463, or £800 a mile. This is a very high figure, due partly to the causes mentioned above and partly to the creation of the five per cent. debentures to liquidate arrears of interest.

The 250,000 ordinary shares of five shillings each are stated in the Financial History as having been applied in payment of the concession, with the exception of seven, which were retained as Directors’ Qualification Shares. No interest has yet been paid on these shares.

BLINKWATER RAILWAY.

The authorised and issued capital of the Blinkwater Railway consists of 200,000 ordinary shares of £1 each. The whole of these shares are owned by the Beit Railway Trustees. There are no debentures.

The capital expenditure up to 30th September, 1923, was £411,750, the excess of expenditure over the receipts being met as to £175,749 by loan on open account from the Beit Railway Trustees, and as to the remainder out of the provision made for renewals.

As the line is 123 miles long, the capital cost works out at under £3,350 a mile, an extremely low figure. Not only has no interest ever been paid on the ordinary shares, but on the money advanced on open account the interest payable is limited to the annual net profits of the Company, subject to a maximum of six per cent. Also, it is not cumulative. Only in five years out of twelve has any interest been paid on the loans, and the total sums thus disbursed have only amounted to £46,517, although the advances at the end of the financial year have for the past twelve years averaged £215,980.
RHODESIA-KATANGA JUNCTION RAILWAY AND MINING COMPANY.

As this railway is not under the control of the British South Africa Company, the information obtainable locally as regards its capital is somewhat incomplete.

This Company was formed not only for railway purposes, but also to work the mineral assets of the Tanganyika Concession in Rhodesia. In order to construct the line, 132 miles in length from Broken Hill to the Congo Border, it raised in 1909 £800,000 5½ per cent. debentures, guaranteed for twenty years as to interest by the Tanganyika Concessions, Limited. The Stock Exchange Year Book shows the whole of these debentures as having been raised at par. They are redeemable at par in 1959. In addition to these debentures, the Company has ordinary shares of two denominations of £1 and 1s. each. The capital expenditure on the railway, as shown in the Company’s accounts on the 30th September, 1919, was £761,348, and since then £5,719 has been expended in Africa on their account by the Mashonaland Railway Company. The first figure apparently covers the expenses of issue and the purchase of the right to construct. The capital expenditure up to date may therefore be taken at £767,000, or at the rate of £5,800 a mile. This figure is a low one, as might be expected from the easy nature of the country traversed.

The lease of £44,000 a year, paid by the Mashonaland and Rhodesia Railways, covers the interest of the debentures, for the payment of which it is allocated.

As the Company has other interests than railways, and the debentures are secured on its other assets as well as on the railway, it is not possible to allocate the shares and debentures to any particular undertaking. All that it is possible to say is that, in addition to meeting the service of the debentures, the railway paid to the Company a profit of £24,251 in the year ended 30th September, 1923, and £35,115 in the year ended 30th September, 1924.

CAPITAL EXPENDITURE OF THE WHOLE SYSTEM.

In the detailed scrutiny above I have indicated those directions in which there appears to have been unusually high capital expenditure. It has been necessary to treat the Companies separately because, amongst other reasons, higher rates are in force on the Beira-Salisbury section than on the rest of the main line. Also, the Rhodesia Railways, Limited, gives to this section twenty per cent. more than its mileage proportion of the receipts from traffic between Beira and points west of Salisbury, besides paying £10,000 a year to the two Beira Companies to compensate them for the suspension of transit dues. The reason given for the first grant is that it is made to compensate that section for the higher costs of working and the lower graded traffic which it carries. Their financial situation is also obviously
responsible as well. In this manner the stronger company comes to the assistance of the weaker ones. / 

If the capital expenditure of the whole system is averaged out, it will be seen that it is extremely low; the sections where high expenditure was incurred form only a small proportion. The total capital expenditure may be summarised as follows:–

<table>
<thead>
<tr>
<th>Railway</th>
<th>Capital Expenditure.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhodesia Railways, Limited</td>
<td>£8,499,304</td>
</tr>
<tr>
<td>Mashonaland Railway</td>
<td>£4,432,142</td>
</tr>
<tr>
<td>Less Beira Railway Debentures</td>
<td>82,500</td>
</tr>
<tr>
<td></td>
<td>4,349,642</td>
</tr>
<tr>
<td>Beira Railway</td>
<td>2,240,469</td>
</tr>
<tr>
<td>Beira Junction Railway</td>
<td>£543,042</td>
</tr>
<tr>
<td>Cost of Concession</td>
<td>67,415</td>
</tr>
<tr>
<td>Wharf Construction</td>
<td>98,682</td>
</tr>
<tr>
<td></td>
<td>709,139</td>
</tr>
<tr>
<td>Blinkwater Railway</td>
<td>411,750</td>
</tr>
<tr>
<td>Rhodesia-Katanga Junction Railway</td>
<td>767,000</td>
</tr>
<tr>
<td></td>
<td>£16,977,304</td>
</tr>
</tbody>
</table>

The figures for the Blinkwater Railway are only up to 30th September, 1923, whereas the remainder are up to the same date in 1924, but the expenditure on this line has been small during the past year and does not affect the total materially.

The following table compares the capital expenditure on the Rhodesian system with other railways in Africa, all of which are either 3ft 6in. or metre gauge:–

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhodesian System</td>
<td>£16,977,304</td>
<td>2,462</td>
<td>£6,896</td>
</tr>
<tr>
<td>South African Railways</td>
<td>114,769,666</td>
<td>11,113</td>
<td>10,327</td>
</tr>
<tr>
<td>Uganda Railway</td>
<td>9,636,358</td>
<td>849</td>
<td>11,350</td>
</tr>
<tr>
<td>Nigerian Railway</td>
<td>17,817,800</td>
<td>1,600</td>
<td>11,136</td>
</tr>
<tr>
<td>(approx.)</td>
<td>(approx.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gold Coast Railway (1923)</td>
<td>6,469,742</td>
<td>397</td>
<td>16,297</td>
</tr>
</tbody>
</table>

The face value of the capital issued on account of the Rhodesian system, excluding the ordinary shares of the Rhodesia Railways, Limited, and the Mashonaland Railway, and including instead those of the Rhodesia Railways Trust, amounts to £18,388,173, plus 600,000 shares in the Beira Railway Company (of no expressed value), or £7,469 a mile.

The Rhodesian system has not been built to the same standard as the others, nor has it undertaken any new construction since the war, but after making full allowance for these facts, it will still remain at a figure far lower than any. This is accentuated by the fact that in the case of the South African, Nigerian and Gold Coast Railways, discounts and expenses of issue have not been included in the figures given. In fact, it would be difficult to find anywhere in the world a railway
system whose share capital or capital expenditure is so low as this one in proportion to its mileage. The public served by the Rhodesian system get the advantage of this low over-all capitalisation indirectly as well as directly, because it enables the lower capitalised members, such as the Rhodesia Railways, Limited, to assist the others financially.

Special reference is made in the Letter of Instructions, paragraph 3, to capital expenditure on works which have been abandoned subsequently. The only considerable items which come under this heading are the widening of the lines of the two Beira Companies, and the B.C.C. pier at Beira. The transactions connected therewith and the results on the capital expenditure have already been explained.

**REVENUE.**

The revenues for the years ended 30th September, 1923 and 1924, as contributed by the various sections of the railway system [...]. It will only be necessary to note here the salient features. The total revenues for the whole system for 1923-1924 were £3,411,134, of which £383,833, or 11.25 per cent., came from passengers, parcels and luggage, £1,237,733, or 36.27 per cent., from general goods, £477,169, or 13.99 per cent., from coal and coke, £857,006, or 25.12 per cent., from minerals of all descriptions, £87,443, or 2.56 per cent., from livestock and vehicles, and £45,885, or 1.35 per cent., from maize and maize meal for export. There had been a general increase of £389,500 since the previous year, of which the bulk had been contributed by an increase of £150,284 in general goods, £106,856 in copper for export, and £77,046 in chrome ore. Maize and maize meal for export decreased by £4,447, and in the year 1922-1923 these contributed 1.66 per cent. of the total revenues.

For the eight months ended 31st May, 1925, there has been an increase of £434,856 in gross revenue, when compared with the corresponding period of the previous year.

In order to allocate the revenue and ton-mileage more closely to the various commodities and classes of traffic than is usually done on these railways, the commodity ton-mileage and goods revenue statistics [...] were compiled. To obtain these figures practically every invoice has to be dissected, and ton-mileage figures have to be worked out therefrom. To have done this for the whole year was clearly out of the question, owing to the labour, time and expense involved. It was therefore decided to prepare them for the most representative month, and October, 1923, was chosen, as the earnings during that period bore the closest proportion to the total earnings for the year. These statistics are based on the total revenue from goods carried for the public, and earnings from railway stores and coal, pier dues, livestock and vehicles, telegraphs and mails, rents and sundry receipts are excluded. They show that 38 per cent. of the total public goods
revenue was derived from goods carried at class rates, the remaining 62 per cent. being from traffic at special rates. Out of this 62 per cent., 16.41 per cent. of the goods revenue was derived from copper for export, and 18.32 per cent. from coal and coke. The proportions of chrome ore and maize for this month are not typical, as the traffic in the former was being restricted in favour of the latter; these are obtained more accurately from the annual figures, which show that export maize and maize meal traffic was 1.69 per cent. of the total revenue from public goods traffic. As the ton-mileage figures show that revenue from local traffic and traffic to the Union in maize and maize meal is in the proportion, approximately, of 4½ to 4 to the revenue from export, the total traffic in those commodities may be said to bring in as nearly as possible 3.6 per cent. of the total revenue from public goods traffic. Chrome ore brings in annually about 7.32 per cent. These are the only commodities in which the monthly figures may be called unrepresentative of the year to any marked degree.

The statistics show further that the average rate received per ton mile on public goods traffic is 1.06 pence; the only comparative figure which I have is from the Nigerian Railway for 1923–1924; this was approximately 2.08 pence. The Rhodesian figure is at a low level owing to the high proportion of low-graded traffic and the long average haul. This is illustrated by the fact that maize and maize meal, railway construction material, coal and coke, lead, chrome ore, asbestos and copper, which are the heaviest traffics, although they account between them for 79 per cent. of the ton-mileage, only furnish 53 per cent. of the total goods revenue, and earn less than ¾d. a ton a mile.

The same statistics taken out for the portion of the railways inside Southern Rhodesia show that the average rate per ton mile is 1.01 pence, and that the same commodities, as mentioned above, produce 81 per cent. of the ton mileage and earn 54 per cent. of the revenue, with an average ton-mile rate of two-thirds of a penny.

Of the individual average rates per ton mile, the most important are local maize at 1½d., export maize at .36d., chrome ore at .46d., copper at 1d. and coal at ½ d. The average rate for all class traffic is 3.23d. per ton mile.

In order to ascertain the revenue which was derived from goods traffic within the boundaries of Southern Rhodesia for the year ended 30th September, 1924, the invoices for that year were dissected and allocated. The results show that the revenue was £1,285,192 out of a total of £2,806,863; it was necessary to include in both these figures the revenue from fuel and stores for railway use. The revenue from traffic worked in Southern Rhodesia was thus 45.79 per cent. / of the total from public goods traffic. Out of this £1,285,192, £253,734, or 20 per cent., was from local traffic from point to point within Southern Rhodesia; £550,780, or 43 per cent., from traffic between points in Southern Rhodesia and points outside, and £480,658, or 37 per cent., from traffic in transit through.
The figures which have been extracted for the traffic with Congo show that the goods and livestock revenue therefrom amounted to £1,229,327, of which livestock accounted for £17,544. The parallel figures, including livestock, for the whole system were £2,795,222. Revenue from the carriage of railway stores and coal is, of course, included in neither case. The receipts from Congo traffic contributed, therefore, 44 per cent. of the total revenues of the whole system from goods and livestock, a striking indication of the importance of that traffic. Of the total increase in revenue of £434,856 for the eight months ended 31st May, 1925, as compared with the corresponding period of the previous year, approximately £280,000, or 64 per cent., has been contributed by traffic to or from the Congo.

WORKING EXPENDITURE.

In my examination of the working expenditure and administration of the system, the main point which I have kept in mind has been the result to the public as reflected in the charges. I have not attempted a minute scrutiny of each particular operation or office, in order to show where minor economies could be effected. That I do not conceive to be the object of this enquiry, which should aim rather at ascertaining whether the railway business is being conducted, in general, with such a measure of efficiency as to ensure that the net revenues are not being diminished nor the rates charged to the public enhanced to an appreciable extent by mismanagement or waste.

In many cases the surest standard by which to judge the efficiency of a railway is to compare the results obtained with those reached by other railways working under conditions which are as far as possible analogous. The difference in the wages paid, however, makes it not only difficult, but also unreliable to compare units of work done against the respective costs, and it is not easy in all cases to obtain the actual figures of cost. Therefore, where comparisons have been drawn with other systems, I have adopted standards which are as far as possible applicable to all. Thus I have compared the amount of labour employed per mile on maintenance, and the mileage obtained from engines and rolling stock, etc., rather than the actual cost per unit of performing the various operations. Even so, local conditions, such as the length of haul and the quality of the labour, prevent these comparisons serving, in many cases, as more than a general guide.

TRAFFIC DEPARTMENT.

Taking first the working of the Traffic Department, as that is the one most closely in touch with the public, the organisation is on the ordinary district basis, with headquarters at Bulawayo. I examined the methods of traffic operation and control of movements, and satisfied myself that these give good results, as far as the limitations of the departmental system permit. In this connection a good guide
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A railway obtains from its goods wagons, with the same proviso, of course, as to local conditions. The following table gives statistics of the working of goods vehicles on various African railways, according to the latest figures obtainable; some lines, such as the South African, do not publish vehicle mileage statistics, and therefore are not included. In the case of the Rhodesian system, the average number of trucks on the system has been taken, and not the actual number owned; this is a fairer test, as all the other lines quoted are disconnected and have no exchange of stock with foreign lines. / 

### GOODS VEHICLE STATISTICS.

<table>
<thead>
<tr>
<th>RAILWAY</th>
<th>Number of goods vehicles</th>
<th>Goods vehicle miles</th>
<th>Average miles per vehicle per year</th>
<th>Net goods ton-miles</th>
<th>Net goods ton-miles per vehicle per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhodesian system, 1920–21</td>
<td>2,111</td>
<td>33,386,414</td>
<td>15,816</td>
<td>458,157,000</td>
<td>217,033</td>
</tr>
<tr>
<td>Rhodesian system, 1921–22</td>
<td>1,988</td>
<td>29,133,150</td>
<td>14,677</td>
<td>443,933,000</td>
<td>223,644</td>
</tr>
<tr>
<td>Rhodesian system, 1922–23</td>
<td>1,970</td>
<td>32,040,868</td>
<td>16,264</td>
<td>504,632,000</td>
<td>256,158</td>
</tr>
<tr>
<td>Rhodesian system, 1923–24</td>
<td>2,066</td>
<td>39,297,427</td>
<td>19,021</td>
<td>585,831,000</td>
<td>283,558</td>
</tr>
<tr>
<td>Uganda, 1922</td>
<td>1,448</td>
<td>18,983,457</td>
<td>13,110</td>
<td>99,994,044</td>
<td>69,057</td>
</tr>
<tr>
<td>Nigerian, 1922–23</td>
<td>3,060</td>
<td>13,208,963</td>
<td>4,317</td>
<td>124,870,935</td>
<td>40,807</td>
</tr>
<tr>
<td>Nigerian, 1923–24</td>
<td>3,062</td>
<td>16,996,840</td>
<td>5,551</td>
<td>167,583,032</td>
<td>54,730</td>
</tr>
<tr>
<td>Gold Coast, 1922–23</td>
<td>909</td>
<td>3,458,757</td>
<td>3,805</td>
<td>29,469,719</td>
<td>32,420</td>
</tr>
<tr>
<td>Sudan, 1921</td>
<td>993</td>
<td>14,615,331</td>
<td>14,718</td>
<td>138,996,965</td>
<td>139,777</td>
</tr>
<tr>
<td>Sudan, 1922</td>
<td>1,045</td>
<td>17,027,409</td>
<td>16,325</td>
<td>115,442,163</td>
<td>110,683</td>
</tr>
</tbody>
</table>
It will be seen that the Rhodesian system compares very well with any of the others; it also shows a progressive improvement. It has, however, advantages in its long average haul of 478 miles and in the fact that much of its traffic is not seasonal, and so gives employment to the trucks during the whole year.

Another test of operating efficiency is the average time taken by trucks in transit. For this purpose I chose certain transits and had the average time taken for them worked out. The average transit time for copper from Sakania to Beira, a distance of 1,467 miles, was 12.0 days in January, 1925, and 13.3 days in April, 1925; and for chrome ore from Selukwe to Beira, 583 miles, for the same months 6.0 and 7.8 days respectively. In October, 1924, the average transit time for trucks of general goods from Beira to Sakanin was 9.3 days. The average time for the round trip for wagons containing coke, taken from the departure from Sakania of the empty trucks to their arrival there loaded, varied in the last eight months of 1924 from a minimum in October of 10.33 days to a maximum in July of 12.41 days. In January the effect of the rains started to make itself felt and caused congestion, with the result that the average rose to 14.06 days. The effect of this congestion is also seen in the increase of the April transits from Sakania and Selukwe as compared with the January ones. The cause of this is, however, outside the control of the agency under immediate review, the operating branch, and the figures given show that trucks are forwarded with good despatch and, under normal circumstances, no unnecessary delays occur en route.

The figures for the average time taken during the months of November, 1923, November, 1924, December, 1924, and January, 1925, between the receipt of consignments in the goods sheds at Beira and their despatch by rail, were respectively 1.29, 1.58, 1.71 and 1.78 days. In November, 1923, 75 per cent. of the consignments were forwarded either the same day or the day following that on which they were consigned; in November, 1924, 66 per cent.; in December, 1924, 62 per cent.; and in January, 1925, 57 per cent. Practically the only traffic which was not despatched on the second day after receipt was either oil or pier traffic awaiting the completion of the consignment before it could be despatched, or traffic from the Trans-Zambesia Railway, which has to wait for the weekly train service. The figures for November, 1923, are good; those for November, 1924, although not so good, call for no serious adverse comment, except that it is to be regretted that the high standard, previously reached, has not been maintained. The figures show that there is no undue delay between the time when the railway receives the goods, fully consigned, and their despatch.

Complete operating statistics for each section are compiled in the Traffic Manager’s office, giving figures for tractive, gross and net ton mileage, the various relations between them and to the train engine hours, together with average train loads, and train mileage in relation to train engine hours. I satisfied myself that not only are these figures compiled, but that they are used both by the Traf-
fic Manager and by the General Manager; in this way it is possible to keep a close check on the working of the outside districts.

[...]. The proportion of gross ton miles to tractive ton miles is a measure of the use made of the power supplied. In 1924 this figure was 81.38 per cent.; the Uganda Railway, the only one whose figures for this are available to me at the moment, had in the year 1923 a proportion of 86.91 per cent., and in 1924 of 87.47 per cent. The latter may be called distinctly good figures, and the Rhodesian one a fair average.

The train miles run per train engine hour provide a check on delays and afford an indication as to the work obtained from engines whilst actually employed. The figure of 14.86 for 1924 is satisfactory, considering the quality of the track and the speed of the trains.

The proportion of train mileage to engine mileage shows the percentage of power employed on other services than the actual hauling of trains, that is, on such tasks as shunting, assisting and running light, which may be classed as unproductive. In 1924 the Rhodesian system had a train mileage of 3,058,222 and an engine mileage of 3,659,551, or a percentage of 83.5. The South African Railways, in the year 1923–1924, had a percentage of 78.8, and the Uganda Railway, in 1923, had 81.7 and, in 1924, 84.7. Local conditions, such as the amount of assisting work necessary on the South African Railways, prevent an exact parallel being drawn, but the figures show that the Rhodesian system is at least on a par with the remainder, and that watch is kept over such matters as the employment of shunting engines, which otherwise can become a fruitful source of waste. A good sign in these figures is the improvement shown each year in the majority of items. This remark does not apply, of course, to the six months ended 31st March, 1925, but, as explained, these were affected by abnormal circumstances.

The increase in train load in 1922 is due to the advent of some more powerful engines in July and August, 1921, but increases since then and the improvement in the other heads can rightly be claimed by the management as due to better working. The difficulties of the past wet season, and the effects of traffic working, are well illustrated by the falling off in the statistics for January, February and March, 1925.

The systems of consigning and invoicing goods and of station accounting are similar to those used in England and the Union, and call for no comment.

From examination of the staff records and from inspection, the staff does not appear excessive; on the contrary, owing to the use of intermediate crossing places where no resident staff is maintained, and the distance between stations, the numbers employed are probably below the average, but it is impossible to give under this head exact figures capable of comparison.
LOCOMOTIVE DEPARTMENT.

The total of locomotives in the books of the Locomotive Department is 127, and a further two are on loan from the South African Railways Administration. Twelve engines of the Garrett type are on order.

The number overhauled during the past five years has been an average of 72,706 each year, or, put differently, approximately 60 per cent. of the engines have received an overhaul each year. The average mileage run between overhauls during the year 1923–1924 has been 42,132 for the main line and 41,066 for branch line and shunting engines. Taking the various classes of engine, the largest main line type, the 11th class, has averaged 42,567 miles between overhauls during the past five years, and the most numerous, the 9th class, has averaged 41,769 miles. Of the smaller engines, the 7th class is the most important, and they have averaged 42,239 miles between overhauls. [...]

The figures usually allowed for general overhauls are once in every two years, or after a mileage of 60,000. The policy adopted hitherto on the Rhodesian system has been to give lighter overhauls than is the usual practice, but to give them more frequently. It is now the intention to alter that policy, and to give more complete but less frequent overhauls. I think, personally, that the change in policy is correct, but it is largely a matter of opinion, and the figures quoted show that no serious exception can be taken to the results obtained. The stock has been maintained in good condition and at reasonable cost.

The average time taken for a general overhaul during the past five years has been 49.18 days for main line and 60.47 days for branch line and shunting engines. These figures, and especially the former, are distinctly below the average, as might be expected from the policy adopted up to date, and the only comment called for is that they show that the engines have not spent an unduly long time either under or awaiting repair. This is also borne out by the next statement in Appendix XX (not included), which shows that during the past five years locomotives have spent only 8.62 per cent. of their total time under overhaul.

Turning to running performance, during the year ended 30th September, 1924, the average miles obtained a year from each main line engine in service ranged from 39,984 for the 10th class to 34,895 for the 8th class. The two most important classes, the 9th and the 11th, averaged 39,768 and 35,654 respectively. On the Nigerian Railways the average mileage obtained from engines in service was 23,006 in 1921–1922 and 20,365 in 1922–1923. The average mileage on the Rhodesian system for all engines, including those under repair, was 28,890; this figure compares with 26,020 miles on the South African Railways for the year ended 31st March, 1924, and 27,605 for the year ended 31st March, 1923. On the Uganda Railway the average mileage, on the same basis, for 1923 was 17,384 and for 1924 was 24,623. The Rhodesian figures are distinctly good,
and prove that full value is being obtained from the capital locked up in the locomotives. This is due mainly to the use made of the system of double-trips and caboose-working. At the same time, the figures given for repairs show that this mileage is not being obtained out of the engines to the detriment of their upkeep. It is proposed to extend the system of double-trips to two new sections, which will further improve the mileage figures.

The number of engine failures is not so satisfactory. In 1923–1924 the number of failures was 200, of which 72 were total and 128 partial; this worked out at an average of one total failure per 50.83 thousand miles run, one partial failure per 28.59 thousand miles and one total or partial failure per 18.30 thousand miles run. The method of classifying engine failures varies on different systems, so that it is difficult to quote any direct comparisons, but from my personal experience I am in a position to state that the figures of the Rhodesian system show that the percentage of failure is higher than in ordinary practice, including therein lines on which native artisans are mainly employed. The redeeming feature is that there has been a marked and progressive improvement in the past five years; in 1919–1920 and in 1920–1921 the failures averaged nearly three times as many as in 1923–1924. The figures for the first five months of the current financial year show one failure of every kind to 20.41 thousand miles run; while no exact comparison can be drawn with a whole year, owing to seasonal variations, this indicates that the improvement is at least not being lost. The present situation, although not satisfactory, cannot be regarded as having any appreciable effect on the working expenses, but rather as capable of improvement and requiring attention for that reason.

As regards the coal consumption per engine mile, the 9th and 11th classes consumed respectively in 1923–1924 68.19 and 71.19 lbs. of coal per engine mile. After taking into account the comparatively high calorific value of Wankie coal, 13,433 B.T.U., these results can still be regarded as a good average, more especially that of the 11th class engines, with their higher tractive force. The high figure for the 8th class engine, 81.84 lbs. per engine mile, is due to the fact that they are the only main line engines which are not super-heating.

The consumption of oil of all descriptions per 100 miles is 5.61 pints for the 11th class engines, 5.31 pints for the 9th class, 9a and 10th classes, 4.90 for the 8th class and 4.85 for the 7th class engines. No fault can be found with these figures, and it was clear to me during my inspection that a good watch was being kept on this important item of expenditure.

In regard to the upkeep of vehicles, the only point to which it is necessary to refer is that of hot axle boxes. I was able to satisfy myself that in all other respects the vehicles were being maintained properly and that the number awaiting repairs was negligible; also that the facilities for repairs were adequate, and that the number under repair at any time was not disproportionate.
In the case of hot axle boxes, the statistics for the four calendar years ended 1924 show that the situation in 1921 was very bad; 5,667 cases occurred, and one axle box ran hot for nearly every 1,000 miles run. There was a marked improvement in 1922, the number of cases dropping to 1,393, and being thus reduced by over 75 per cent. In the year 1924 the total had been reduced to 542, or one-tenth of the number for 1921, and the average per 1,000 miles to .008, or one-twelfth of that for 1921. But, great as the improvement has been, the number of hot axle boxes is still higher than it should be. As in the case of engine failures, the present situation, although calling for improvement, is not such as to affect the public materially, either through the extra expenditure incurred or the interference caused to the service. The same report, however, could not have been given of the situation in 1921.

The main workshops are situated at Bulawayo and subsidiary ones at Umtali. The former are of modern construction and equipment, and the two together provide adequate facilities for the upkeep of the present stock of locomotives and vehicles, and of a small addition thereto. The Bulawayo shops are also capable of further extension when it becomes necessary. As mentioned earlier, the average times taken for general overhauls are not excessive.

The control of expenditure is mainly in the hands of the Chief Locomotive Engineer, in whose office the figures as to costs and moneys spent are compiled. The object of this procedure is to relieve the Works Managers as much as possible of clerical work, and so leave them free for personal supervision. While this enables a reduction in clerical staff to be made at the shops themselves, the Works Managers, who do not receive from the Chief Locomotive Engineer any figures as to their expenditures, are left very much in the dark as to the results they have achieved, when judged by the standard of money spent.

The Works Managers undoubtedly supervise the work in the various shops closely, and I satisfied myself by inspection of the shops and returns that it is executed with reasonable despatch and economy, but it would give the Works Managers a surer test by which to judge the work done if the Chief Locomotive Engineer informed them of the cost of doing it. I am not advocating the initiation of an elaborate system of costing every job undertaken, as that saves less than it costs in extra staff, but in the case of larger jobs, e.g., that of the general overhaul to an engine, the possession by the Works Managers of knowledge as to the cost enables them to keep a surer grip over the expenditure, and to see whether or not they are making any improvement in this important respect.
DIVISIONAL SYSTEM OF OPERATION.

I have stated earlier that the results of operation may be considered good within the limits of the departmental system. That system is the traditional one associated with British railways. The alternative is the one known as the ‘divisional’ or ‘transportation’ system. The essential difference is that in the latter the running of locomotives, the responsibility for their use and the charge of the locomotive running staff, are combined with the operation of traffic and movement of trains into one department, which is often, though not always, responsible also for the maintenance of track. In the other system, the Locomotive Department is alone responsible for the running of locomotives and for their charge, whether on the road or in shops, and the Engineering Department for the maintenance of way and works, while the Traffic Department looks after the movement of trains and vehicles, and has supervision over the guards and conductors as well as the station staff.

The advantage claimed for the divisional system is that everything connected with the operation of transportation is under one head, both throughout the railway and in the districts or divisions into which the railway is split. There is thus more unity of effort than in the departmental system, where not only questions of principle, but matters of detail have to be referred to headquarters should the local representatives of the departments be unable to agree. Even at headquarters, unless the departmental chiefs agree, the decision of the General Manager has to be sought on comparatively trivial matters. This only occurs, it is needless to say, in extreme cases, and it is fair to say that I did not notice any evidence in the Rhodesian system of inter-departmental disputes at the present time, but there was evidence that it had occurred in the past, and it is always liable to recur. Even if the relations are harmonious, there cannot be the same unity of effort when two have to combine as where one man is solely responsible. He can look at all aspects of any particular question and make a decision on the general merits, whereas in the departmental system the traffic man and the locomotive man are bound to regard everything in the first place from their particular standpoints. They would not be human if they did not think first of how a proposal would affect their own particular costs of working, by which they are judged, but the divisional man is judged by the costs of operation as a whole, and so can take a wider view.

On a lengthy or widely spread system, where several days may elapse before a final decision can be obtained from headquarters, the divisional system is obviously placed in a still better position.

That these benefits are not merely theoretical is shown by the number of railways who have in recent years changed from the departmental to the divisional system, whilst there is no single instance of which I am aware of the reverse. The
Central South African Railways adopted the latter system in the year 1909, and, when the Union of South Africa was formed, it was extended to the whole of the South African Railways. It was inaugurated in the Uganda Railway as the result of my recommendation in 1922, and subsequent annual reports have borne witness to the advantages gained. It was introduced on the Great Indian Peninsula Railway in 1923, and the Chairman in his speech at the annual meeting the following year stated that, thanks to its adoption, the railway had been able to load and move more wagons than ever before in the busy season, though the wagon stock was much reduced, as reflected in the wagon balance account with other railways. The New Zealand and the Madras and Southern Mahratta Railways are making arrangements to change their organisation in the same way, as also, I understand, is the Nigerian in consequence of my recent report on that railway. Finally, in England, the home of the departmental system, both the London, Midland and Scottish and the London and North Eastern Railways have modified schemes in force. Throughout the United States and Canada the divisional system has always been the rule, probably due to the immense distances, which disclosed in early days the defects of the alternative method. This is a formidable array of evidence, against which it is impossible to place, as far as I know, any instance of a change in the other direction.

The Rhodesian system is long and scattered; though its headquarters are placed centrally, the distance to either end, where most of the traffic originates, is at least two days by the fastest train. A divisional organisation is therefore well adapted for its needs, and I am of opinion that its introduction would reduce the costs of operation. It is impossible to give any accurate forecast as to the amount, because the effect would be felt mainly in the shape of better use of locomotives, rolling stock and staff, all items difficult to assess, rather than in elimination of offices and consequent reduction of clerical staff.

The General Manager is, in principle, in favour of the adoption of the divisional system, and had a scheme prepared as early as 1921 with that object. The obstacle which apparently stands in the way is that the senior staff of the two departments principally affected, the Traffic and the Locomotive, has been weakened recently by resignations and death, and the General Manager is unwilling to incur the dislocation, which the inauguration of a new organisation would entail, until the personnel has been strengthened. I think, on the contrary, that the longer the alteration is delayed the greater the dislocation which will occur, especially with the large increase in the Congo traffic which may be anticipated shortly. I am of opinion, therefore, that the sooner the new system is brought into force the better; the advantage will be reaped when the heavier traffic has to be handled.
ENGINEERING DEPARTMENT.

I have stated earlier that the whole system, despite certain improvements, still remains, as regards its track and formation, a pioneer line. The formation is narrow, and no stone-ballast is laid except in a few spots. A line of this character is admirably suited for the early days of development, when traffic is scanty and only a few trains are run. Even if trouble is experienced during the rainy season and derailments occur, it is not a matter of supreme importance. It is much better to have a few derailments and washaways than to burden the railway at its start with excessive interest charges. It is unfortunately only too often that one sees new lines built to an extravagant standard, when all the traffic which they will carry for the first few years cannot exceed two or three trains a week at the outside. But, once the traffic reaches any considerable dimensions, the track must be strengthened to carry it. It is not only that the extra number of trains does an increasing amount of damage to the track, but derailments and interruptions disorganise the traffic to an extent which increases out of all proportion.

During the year ended 30th September, 1924, the Rhodesian system carried 1,351,188 tons; the tonnage on the Beira-Salisbury section was 584,568, and, on the Salisbury-Kalomo section, 984,135 tons; the average per day over the whole system was 3,700 tons, and on the heaviest section was 2,700 tons. Much of this traffic is also in full truck loads of heavy commodities like chrome, copper and coal. A railway carrying this traffic can no longer be classed as a pioneer line for development purposes; it has long passed that stage. The consequence of attempting to run traffic of these dimensions over an unballasted line is illustrated very well by the number of derailments* which have taken place. In the year 1921–1922 there were 253 derailments; in the year 1922–1923, 482; and in the year 1923–1924 there were 252. The rains during the wet seasons of 1921–1922 and 1923–1924 were light, which accounts for the smaller numbers, but even these figures, namely, 253 and 252, are high. All these figures, however, are completely overshadowed by those for the past wet season. This brought the heaviest rainfall that has been known for many years, and it showed up in a very forcible manner the weakness of the track. In the three months January to March, the derailments reached the alarming figure of 586, or over seven a day; of these 78 entailed a delay of over six hours each. This delay does not measure the dislocation of traffic, because it is merely the time taken to get the line clear and open for working; the effect of the interruption is felt all down the line and in an increasing degree. During the same period twenty washaways occurred, exclusive of the big break at the crossing of the Pungwe River, which suspended traffic for twenty-four days; this is excluded, as it is a special case requiring special treatment, and therefore must not be confused with
what I may call the every-day washouts and derailments. The consequences of these were very serious and far-reaching; they were, of course, accentuated by the Pungwe break, but long after the time lost through that should have been regained, the constant interruptions interfered so seriously with the movement of trains and rolling stock that the arrears of Wankie traffic have not yet been overtaken, and until well into April most of the passenger trains were running hours late. Nor are the effects limited to the traffic; in addition to the heavy cost and damage due to the derailments themselves, large overtime payments had to be made to the train and maintenance staff, and, quite apart from the expense and waste of overtime, the effect of long hours on the staff is in itself bad.

The gravity of the situation has been recognised by the Boards in London. I have seen the correspondence which has passed between the General Manager and the London Office, as a result of which the General Manager has been instructed to prepare a programme for ballasting the main line throughout with stone, widening, lifting and draining as necessary. In the letter calling for this programme it is stated that it is the intention of the Boards that the work should be completed in five years. The estimated cost is £982,000, which for the 1,461 miles of main line works out at £672 per mile. A programme of this magnitude cannot be carried through in a short space of time; engines and rolling stock have to be obtained, if there is not sufficient surplus available locally, new quarries have to be opened along the line, special traffic arrangements have to be made, and the whole undertaking requires some time to get under way. I do not consider that five years is at all excessive, but every effort should be made to keep up to programme.

The organisation of the Engineering Department follows ordinary departmental lines, and calls for no comment. The low standard of the track makes it very difficult to judge the efficiency of the department, because in the rains of the last wet season it was humanly impossible to keep an unballasted road in order under so heavy a traffic. The derailments added to the difficulties, because so much of the time was spent on them and constant attention had to be given to the specially weak spots, to the detriment of the rest.

The main expenditure of an engineering branch is on labour; it always provides more than half, and often runs up to as high as two-thirds of the total. On the Rhodesian system the lowest number of natives* employed on the track during the year 1923–1924 in any one month was 1.83 per mile, which increased to a maximum of 2.75 during the rainy season. The European gangers averaged .149 to .169 per mile. This figure includes inspecting staff, so that the average length may be said to be slightly more than seven miles. The maximum is about eleven miles, decreasing to about six on the worst section east of Umtali. These figures are very low. The average number of men allowed per mile in India is two; in Nigeria, where only a small proportion of the line is unballasted, the average
per mile in 1924 was 3.04. On the Uganda Railway, where the track and conditions resemble more closely those in Rhodesia, although of a higher standard, the number employed per mile in 1922 was 3.2. The figures for Uganda and Nigeria are certainly on the high side; those for Rhodesia, on the other hand, are much below the average, lower, in fact, than I think advisable for this class of track.

Turning to expenditure, the cost per mile in Rhodesia for maintenance of track was £135 0s. 5d. For the whole work of maintenance of way, works and buildings it was £154 per mile. In Uganda, in 1924, the figure was £181, in Nigeria £178, and on the South African Railways £237 per mile. No strict comparison can be drawn between these figures, and especially with the last, because the conditions on the South African Railways as regards the track itself and the speeds run over the main lines are so different, but it is sufficient to show that the Rhodesian figures are distinctly low. I am very doubtful, however, whether in this case a real economy has been effected, and whether the expenditure of more money on maintenance would not in the end have proved the truer economy. The past season has certainly produced rains which have easily exceeded those of any previous year since records have been kept, and the Railways contend that it would be unfair to expect them to be prepared for something which was quite out of the ordinary. But on the other hand, the derailments of previous rainy years, such as 1922–1923 when there were 482, are by no means negligible. On the contrary, they are far higher than one would expect to find. Even though a programme of ballasting was not undertaken, which in the light of after events would certainly have been the wisest course to pursue, I think a certain improvement could have been effected by a larger expenditure on maintenance. The length of line for which a ganger is responsible is certainly above the average, especially on unballasted track with this traffic. In tropical rains it is practically impossible for a man to maintain efficiently a length of eight miles with many sharp curves and narrow cuttings, such as are found on the heavy grades in Portuguese East Africa. The difficulty in making them smaller lies partly in the spacing of the gangers’ cottages; to have shortened the length would have meant building a large number of new houses, which would in turn have become useless when the ballasting is completed and the gangers’ sections can be again lengthened. I think the difficulty could have been met by the use of temporary houses, or wood and galvanised iron buildings, which could have been removed elsewhere when not required.

I do not mean to imply that the whole of the trouble of the past season could have been avoided, or that once the rains had started the employment of large numbers of extra men, who would necessarily have been entirely new to the work, would have afforded much relief, but I am of opinion that if the lengths had been shorter, say, five to six miles in the bad sections, and a proportionately
larger force of labour had been employed habitually, the number of derailments in previous rainy years would have been reduced and a certain amount of relief given, even in the past year.

STORES DEPARTMENT.

One of the first items which strikes the eye of anyone reading the report of the General Manager and the published accounts is the large sum shown in the assets under the heading of ‘Stores on Hand.’ Apart from the loss of interest on the money thus locked up, it is a possible means of creating reserves, although a clumsy one for the very reason that no interest is being earned.

The store-holding Company is the Rhodesia Railways, because it is the one in the best financial position. The other Companies buy their stores from it as required.

The statement of assets* in the General Manager’s report for 1923 shows the value of stores in hand and in transit on the 30th September, 1922, as £1,009,649; by the 30th September, 1923, this figure had been reduced to £840,755, and by the 30th September, 1924, to £783,409. Although there has been a marked reduction in the past two years, the value of the stock in hand still appears to me to be too high. The value of stores issued for the year 1923-1924 was £537,640, so that the stock carried represents about 1½ years’ consumption.

The normal time which elapses between the despatch of indents and the receipt of stores from England is six months. Some of the stores are purchased / locally, and are therefore obtained in a much shorter time than this. For stores received from England it would not be safe to work on a lower margin, for items of everyday consumption, than would be provided by nine months’ stock. Allowing for a normal stock of spares, this would give a stock on hand of the value of about £500,000, and this I consider should be adequate. On the Nigerian Railway the stock on hand on the 1st September, 1923, was £257,735, for a line 1,126 miles [illeg]ong; on the Uganda Railway the value at the end of 1924 was £314,263, for a mileage of 940.

The principal cause for the present excess is the large quantity of locomotive, carriage and wagon spares held. The stock of stores held specifically for this Department amounted, on 30th September, 1924, to over £389,000. While it is only prudent to hold sufficient to ensure that, in the event of accident, locomotives and rolling stock are not kept idle, waiting for the receipt of spare parts from England, it is wasteful to maintain large stocks of parts which require to be replaced very infrequently. The custom in the past has been to stock three or four parts of this kind where one article, or at the most two, would have been ample to guard against any probable contingency. To quote examples from those which
came to my notice when examining the stores and the books, four pairs of connecting rods are stocked for 9th class engines; there has only been one pair issued since the beginning of the year, and a pair to replace it was at once ordered. For the 11th class there are four spare pairs of connecting rods in stock, and none have been issued since 1921. One hundred compensating beam link pins for 11th class were in store in July, 1922; since then only 33 have been issued.

The chief blame in this matter lies with the Chief Locomotive Engineer, because it is a technical matter in which the Stores Superintendent has little say. The Locomotive Engineer likes to have a large reserve; the loss caused thereby does not appear in the running costs and is not debited to his Department. He is, in fact, working on a large margin at someone else’s expense. It is only just to the present holder of the office to say that the large orders which gave rise to the present excess were placed before he was appointed.

It is unfortunate that a large part of the locomotive spares were ordered when prices were very high, and it will take a long time to work off the surplus stock. Efforts are, however, being made to sell the surplus to other Railways, such as the South African, who have the same classes of engine. If these efforts are unsuccessful, it will take some time to work down to the total stock figure of £500,000 which I have named.

I have seen the correspondence which has taken place between the General Manager and the London Office regarding the whole subject, and it is clear from this and from the statements in the annual reports that the Railway Authorities had already recognised that the stocks were too high and were endeavouring to reduce them. Precautions against excessive ordering had also been taken.

No attempt has been made to write down to present-day values stocks still held which were purchased at the high prices ruling shortly after the war. These are still shown in the accounts at the price paid for them.

A stores stock adjustment account is maintained by means of contributions of one per cent. on the cost of stores, other than permanent way material. The average amounts thus set aside have been £3,000 a year, and the credit of the account on 30th September, 1924, was £38,189. The objects of this account are to adjust differences in stock verification and to provide funds to compensate for loss or wastage from obsolescence. I have no adverse comment to make as regards the maintenance of this account.

The Stores Department is worked on the same principle as on the South African Railways. The overhead charges of the Department are met by adding certain percentages to the cost of articles when issued to Departments. In this way there is no separate heading in the accounts for the costs of the Stores Department, but they are distributed amongst the other Departments in proportion to the work performed by them. The system is a sound one, and now that a Purchasing
Board has been established to keep a check on indents, the organisation appears well adapted to guard against a recurrence of over-ordering. / GENERAL ADMINISTRATION.

This examination of the principal departments of the Railway Administration shows that there are no evidences of mismanagement or waste, such as would affect the net revenues or the rates appreciably. I have criticised certain features, but in most cases, and certainly in all the more important ones, the Railway Authorities were already paying special attention to them. From personal inspection, also, I am of opinion that the system is managed and operated with a good measure of efficiency, and the expenditure is carefully watched.

My Letter of Instructions specially asks me to state whether reduction of working expenses could be made without loss of efficiency; I would be failing in my duty if I did not point out one particular direction in which, in my opinion, they could be reduced. It does not lie, however, entirely in the hands of the Railways. I refer to the technical education of the native.

There is a very large class of so-called skilled work, which does not require skill or knowledge of a high order and can be performed by natives under periodical supervision after a short period of instruction. Examples of this are drilling, rivetting, plain turning, house painting, firing on a locomotive, and the ordinary gangers’ work on the track. To take the last example, a skilled ganger is expected to be able to lay a set of points and crossings, but the ordinary ganger on a railway like this is seldom, if ever, called upon to do it. Many of them must pass through their whole service without ever being required to carry out such work. The bulk of their duty consists of lifting and packing, maintaining curves in good condition and seeing that the drains and ditches are kept clear. No one can deny that a native could acquire the necessary knowledge in a short time. More supervision would no doubt be necessary, but this could be arranged by placing a European permanent way inspector in charge of every thirty to forty miles, with native gangers under him, and by giving him a pump trolley. It would also solve the difficulty of housing, in connection with the shortening of the gangers’ lengths. Similarly, the work of firing a locomotive is easily within the scope of the native, and he is probably better suited physically for this work than the man of English descent. Work requiring a much higher degree of skill than the trades mentioned is being performed by natives in many parts of Africa. The contention may be raised that the native of Rhodesia is not as capable of receiving instruction as those of other countries. This argument has been advanced by the opposition in practically every country where native skilled labour is now used, and has, as invariably, been found false. It therefore carries little conviction.
The European wages bill of the Engineering Department is over £150,000 a year, and of the Locomotive Department over £300,000. As the natives would only cost at the most £3 a month against the £20 to £25 which is now paid to the Europeans, it is clear that a saving of £100,000 in each of these departments should be obtainable in two or three years without difficulty. There is no need to lay stress on the importance of this from the point of view of rates. If education of a more skilled order was given, and the native was allowed to be employed as a fully-skilled tradesman, still larger economies would be effected.

The adoption of such measures would entail a complete reversal of present policy; the Railways alone could not embark on it; the change would have to be supported by the people of the country and the Government.

The only aspects of the case which I can discuss are the economic ones, as they affect the railway situation; against these have to be weighed the social and political views, which do not lie within the competence of this enquiry.

RESERVES FOR RENEWALS.

Before examining the provision which has been made by the Railway Companies for renewals, I think it advisable to explain the principles upon which provisions for this purpose are made in accepted railway practice, because from the statement of case put forward by the Association of Chambers of Commerce there appears some misconception of the subject. In that statement the following words occur: ‘Provided the permanent way is maintained we cannot see that any charge by way of depreciation is incurred. On the contrary, the value of the permanent way (i.e., its carrying capacity) is increased as population and traffic increase.’

Maintenance and renewal of permanent way are two entirely separate things; maintenance consists in keeping the existing track in proper order for the passage of trains; renewal consists in replacing that track when worn out. It is true that occasionally the boundaries between the two are somewhat indefinite, as when a rail is broken or a short length of track wears out in an abnormally short time, but in general they are entirely distinct. The increase in the value of the permanent way owing to the increase in population and traffic has no relation to the question. Increased traffic and bad maintenance will decrease the life of the track, but whether the traffic increases or decreases and however well or badly the track has been maintained, a day will eventually arrive when the permanent way has to be renewed, and the same is true of all the wasting assets.

It is a fundamental principle of railway finance and accounting, as in other ordinary business concerns, that the assets which have been purchased by the original capital outlay must be renewed out of revenue when they are worn out. The provision for this purpose constitutes a working charge against revenue,
which must be met before any profits can be distributed. There is no other source
from which it can be drawn; to use fresh capital for the purpose could not be
defended on any grounds. The management has not merely the right to make
provision out of reserves; it is its duty. This cannot be expressed better than in
the words of a judgment of the Supreme Court of the United States:

‘Before coming to the question of profit at all the company is entitled to earn
a sufficient sum annually to provide not only for current repairs but for making
good the depreciation and replacing the parts of the property when they come
to the end of their life ... It is entitled to see that from earnings the value of the
property invested is kept unimpaired, so that at the end of any given term of
years the original investment remains as it was at the beginning. It is not only the
right of the company to make such a provision, but it is its duty to its bond and
stock-holders, and, in the case of a public service corporation at least, its plain

The methods used for making the provision from revenue vary. In early days
in England nothing was provided until the time came when the asset had to be
replaced, and the whole cost was then charged against the working expenditure
of that year. This method obtained until quite recent years on a few English rail-
ways. It had the grave disadvantage that it did not equalise the charge over the
whole life of the asset, and threw an extremely heavy burden on some years and
practically none on others. This method has been abandoned since the amalga-
mation of the British Railways.

The second method, which is that now used by all the four big British Rail-
ways, as shown in the evidence before the Railway Rates Tribunal on section
58 of the Railways Act, 1921, is to set aside each year amounts based on the
estimated lives of the various wasting assets, so that when the life has expired
the original cost will have been replaced. These annual provisions are put to the
credit of a special fund, to which is debited the cost of replacement. The same
procedure is enforced by the Inter-State Commerce Commission of the United
States. This method was formerly adopted by the South African Railways, but
was subsequently altered for one under which a lump sum was contributed, cal-
culated at 2.86 per cent. of the capital cost of the wasting assets at the time of the
change. Subsequent modifications have been introduced, lowering this percent-
age. The aim of the South African Railway Administration is to provide funds
sufficiently large to meet the maximum expenditure that is likely to be incurred
in any year.

Another method, adopted, I understand, by some South American Railways,
is to fix the annual contribution at a certain percentage of the gross revenue. This
has the disadvantage that the amount required for renewals does not vary in
direct proportion to the revenue and may have only a distant relation to it.
Until 1921 no regular system was adopted by any of the railway companies of the Rhodesian system. Sums were allocated from time to time to renewals reserve, but on no fixed basis. The sums so allocated fell short by a large amount of what would have been provided under any of the regular methods. In 1921 it was decided to adopt the method of basing the annual provisions on the estimated lives of the assets. The capital cost of the engines and rolling stock was ascertained from the books, and contributions based on the estimated lives of these assets have been made since that date. As regards the contributions which should have been made for the previous years of their lives, sufficient sums were noted as available for this purpose from the sums already available in the renewals reserve, so that so far as these items are concerned full provision has been made to date. The same procedure is adopted for engines leased under hire purchase agreements. The cost of renewing the permanent way over the various sections of the track was calculated, and the lives of the various sections were also estimated. The valuation was re-adjusted in 1922 to the prices then ruling. Annual contributions based on these estimates are now made. For the previous contributions which should have been made, the balance remaining out of the pre-1921 contributions, after the claims of locomotives and rolling stock had been satisfied, was assumed as available. It was insufficient, however, and since 1st October, 1924, additional contributions have been allotted, sufficient to make good this shortfall before the expiry of the various lives. The same procedure has been adopted for buildings (other than stores and workshops) and telegraph poles and wires. It should be noted that the current financial year is the first in which provision for shortfall, based on the unexpired life, has been made locally in Africa; any provision which has been made hitherto on this account has been made by the London Offices.

For stores and workshop buildings, workshop plant and machinery, a similar procedure is adopted, but the amounts, instead of being debited to ordinary working expenditure in Africa, are notified to the London Office and credited by them to the reserves. No allocation to make good shortfall is applied in this case, as in previous years due provision was credited and debited to working expenditure between the respective companies who did the repair work and for whom it was done. In the case of plant and machinery along the line and at depots, no provision, either current or for shortfall, is made at present.

The Vryburg-Bulawayo section is treated in the same way as regards locomotives and rolling stock, but differently for its other wasting assets. A lumpsum allocation of £50,000 a year is made on account of them; if calculated as for the other sections, the annual charge would be £105,700, including provision for shortfall. Although separate allocations are made as regards the different classes of items, the final results are merged together into a single heading, reserves for renewals. No fund, in the proper sense of the word, is maintained.
For the Rhodesia-Katanga Junction Company no contributions to renewals reserve are made in Africa, nor is there any evidence available locally as to whether or not any are made in London.

It will be seen that the method adopted by the Rhodesia Railways is based on what I called earlier the second method, *i.e.*, that of basing the annual provision on the lives of the assets. This method, as I have pointed out, has high authority behind it. The South African Railways have adopted another, which results in a smaller annual contribution, and are satisfied that this is sufficient for their purposes. That is a matter for the South African Railways, and they are sufficiently good judges of what suits them best, but what is possible and may be sound for a State railway, with the finances of the Union behind it in case of difficulty, is not necessarily sound for a private railway company. For instance, the South African Railway accounts for the year ended 31st March, 1924, show a balance to the credit of the renewals fund, taking the railway portion alone, of £1,711,360, and disbursements from the fund, on account of railways, of £1,282,131. I do not think a private railway company would feel very secure if it had habitually a reserve of less than 1½ years’ expenditure. It is impossible to condemn the Rhodesian Companies for adopting the same principles as are used by all the big British Companies and are enforced by the Inter-State Commerce Commission of America, which was formed to watch, primarily, over the interests of the public and is extremely jealous of them.

As regards the provision to make good shortfall, the whole of the money to replace the asset must be found out of revenue by the time the asset has to be renewed. If insufficient provision has been made in the past, it has to be provided currently. The past has escaped its full share of the burden, and so the present and the future have to make it up by the time the life expires.

So far, therefore, as concerns the principles on which their renewals provisions are made, the Railways stand on unimpeachable ground, and the only counts upon which they can be condemned are if the lives which have been estimated for the various classes are too short, if the values which they have taken for replacement are excessive, if they have paid for renewals out of current working expenditure at the same time that they were making annual allocations to reserves for the same asset, or if any charges which should rightly be borne by capital, such as the cost of improvements effected in the course of replacement, are being debited instead to the renewals reserve.

The lives which have been assumed by the Railway Companies are as follows:

- Engines: 28 years
- Coaches: 28 years
- Wagons: 25 years
- Buildings (other than workshop and store buildings), brick: 100 years
Buildings (other than workshop and store buildings), wood and iron  
Workshop and store buildings, brick  
Workshop and store buildings, wood and iron  
Workshop plant and machinery  
Telegraphy poles and wires  
Pumping plant and machinery, cranes, etc.

50 years  
75 years  
20 years  
20 years  
50 years  
25 years

The lives of the rails and sleepers have been estimated separately for each section of the line. For the rails, the lives vary from 40 years on the branches to 35 years on the Victoria Falls-Broken Hill section, 30 years on the Victoria Falls-Umtali section, 28 years on the Beira Railway and 26 years on the Beira Junction Railway. For sleepers, the lives vary from 35 years on branches to 27, 26 and 25 years on the main line.

None of the lives taken for the assets, in the above table, can be called too short. On the contrary, those for ordinary brick and wood and iron buildings, and workshop plant and machinery, appear to me to be too long. None of them are less than, and some of them are higher than, the lives which I have previously recommended for adoption by various Government railways in Africa. Also, it is established that the contributions cease for any asset as soon as its estimated life has expired and its original cost has been replaced in the reserve for renewals. Should it still be kept in service after this, no further contributions are made on its account.

The lives of the rails and sleepers have been very carefully estimated and do not appear to me excessive. The estimates were made comparatively recently, when the need for renewal was becoming apparent. It is owing to this that they coincide so accurately with the five years’ programme of renewal, started in 1923 and now in operation. The Railways consequently can claim complete justification in that the money will be required to carry out the actual renewals by the time the life has expired.

In every class except permanent way the contributions have been based upon the original capital cost, and to this no objection whatever can be raised. In the case of permanent way, the contributions were based on the estimated cost of renewal in 1923 at the prices then ruling, which, for the material alone, was £2,079 a mile. The Railways’ argument in support of this may be summed up to the effect that in the case of permanent way, where one rail is replaced by one identical to it in weight, the actual cost of replacing that rail must come out of revenue and not only the original cost. They point out that this method is used both in the United States and India. The danger lies in the possibility of prices falling, as they have done in this case, and so causing too large contributions to be made. The last permanent way material purchased by the Railways was in April of this year, and cost £1,774 a mile. This figure was given to me by the management; they regard it as abnormally low owing to foreign competition, and
judged by the quotations in the trade press it certainly appears on the low side. As against this the labour costs of re-laying have increased since 1923. There is as yet no danger of the total contributions being too large on this account, owing to the low contributions paid for the Vryburg-Bulawayo section and also because of the shortfall of previous years, but it will occur if the total contributions, current and for shortfall, are continued up to the end of the estimated lives. The remedy for this is re-valuation, when the contributions already made are taken into account and reductions made in the annual allocation both to allow for this and for the decreased cost. The Railways made one re-valuation on these lines in 1923; they state that they intend to make them in the future. I consider that one should be made to take effect in the accounts for 1925–1926.

During my investigation I have found no evidence whatever that renewals are being charged to ordinary working expenditure at the same time as annual allocations are being made to reserves for the same assets. When the track on sharp curves wears out in a very short time, the renewal is charged to working expenditure, but this is normal practice, because when the time comes for the whole section to be renewed these curves are also renewed, and the cost of that operation is borne by the renewals reserve. Any intermediate renewals which are necessary must be charged against current working expenditure.

I have also satisfied myself that charges which should rightly be borne by capital are not being made to renewals reserve.

Where, as in re-laying the branch to Selukwe, a heavier rail was used than the original one, more sleepers were laid to the rail length and additional ballast provided, the cost of the extra weight of rail and of the extra sleepers and ballast has been charged to capital. The same procedure is being followed in the re-sleepering of certain sections of the Beira and Beira Junction Railways. Another instance is the substitution of stone as ballast for disintegrated granite, where (the extra cost is being borne by capital.

Most of the criticisms which have been levelled against the Railways on the score of renewals have been based on the figures shown in the balance sheets of the Companies under the heading 'Reserve for Renewals.' In the balance sheets of the Companies for the year ended 30th September, 1924, the reserves for this purpose are shown as follows:

<table>
<thead>
<tr>
<th>Company</th>
<th>Reserve Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mashonaland Railway Company</td>
<td>£775,764</td>
</tr>
<tr>
<td>Mashonaland Railway Company, on hire purchase stock</td>
<td>125,630</td>
</tr>
<tr>
<td>Mashonaland Railway Company, on hire purchase stock</td>
<td>£901,394</td>
</tr>
<tr>
<td>Rhodesia Railways, Limited</td>
<td>2,332,851</td>
</tr>
<tr>
<td>Beira Railways</td>
<td>184,507</td>
</tr>
<tr>
<td>Beira Junction Railways</td>
<td>44,783</td>
</tr>
<tr>
<td>Total</td>
<td>£3,463,535</td>
</tr>
</tbody>
</table>
The final accounts of the Blinkwater Railway Company for the year 1923-1924 are not yet available, but at the 30th September, 1923, the reserve for renewals stood at £37,893, so that the total of the reserves at the 30th September, 1924, for these five companies, may be placed at £3,500,000.

The Rhodesian railway system is a young one as the life of the railways and their assets are measured. None of them are more than thirty years old, and most of them are under twenty-five. The time when the principal assets, the permanent way and the rolling stock, will become worn out and must be renewed is only just arriving; up to date the amount which it has been necessary to spend on renewals has been negligible, but the next few years will make a great change in that respect. A five years’ programme was commenced in the financial year 1923-1924, and is due to be completed by the 1st October, 1928. The total cost will be £936,631, of which £882,274 remain to be spent. This programme contemplates the renewal of 250 miles of rails and 340 miles of sleepers, between Beira and Salisbury, and the renewal of 250 miles of sleepers between Salisbury and Bulawayo. The portion of this which will fall to the debit of the Beira Railway is £295,338; its renewal reserves are at present £184,507, and the four years’ contributions due till 1st October, 1928, will be £133,224, so that when the programme is completed the Beira Railway Company’s reserves will have fallen from £184,507 to £22,393. This programme affects only a small portion of the system; it will mean re-sleepering less than one-third and re-laying with rails less than one-tenth of the Mashonaland Railways, and as regards the Rhodesia Railways it means re-sleepering less than one-fifth of its length and no renewals of rails. That work will have to be undertaken as soon as the present programme is completed, and when it is done it will cause very heavy reductions in the renewals reserves, as in the case of the Beira Railway, only much greater because of the larger mileage to be renewed. In the next four years, too, it is anticipated that £300,000, approximately, will have to be spent on renewals of locomotives and rolling stock. The very high level at which the reserves stand is, therefore, a passing phase due to the fact that the time for renewals is only just arriving.

MISCELLANEOUS AND SPECIAL EXPENDITURE.

Examination of the working expenditure does not show any instances of expenditure, which should have been borne by capital, having been debited to the ordinary working heads of permanent way and works, telegraph expenses, locomotive and rolling stock maintenance and running, traffic, pier and general expenses.

The Mashonaland Railway Company leases a certain quantity of rolling stock from the Beit Trustees on hire purchase agreements. Under their terms a certain fixed sum is paid yearly, of which a portion forms the redemption of the
principal and the remainder the interest. The interest naturally decreases each year as the principal is redeemed, until towards the end of the time the bulk of the fixed sum paid each year goes to redemption. In addition, the same allowances as for the ordinary rolling stock are set aside for depreciation each year. The sums set aside yearly for redemption are entered in the balance sheet of the Company and are not debited to revenue. The interest charges are included in the interest account and depreciation is charged to revenue. On the completion of the account the sums placed to redemption of principal are added to the capital account, and those to depreciation to the renewals account. Until then it would be incorrect, of course, to include the expenditure on the stock in the capital account, as it is not yet the property of the Company. The interest charged is light, being in most cases five and in some cases as low as four per cent. The original value of the stock hired to the Mashonaland Railway Company, under agreement, amounts to £168,650. These agreements are normal; although not common in England, they are frequently used abroad and especially in America. It will be seen that there is nothing in them to which exception can be taken.

For the remaining two heads of working expenditure, miscellaneous expenses and special expenditure, I have had a statement prepared covering the last four years and showing the several items in more detail than in the published accounts. [...] The only considerable items in the miscellaneous expenditure for the last year are £11,755 for accidents and derailments and £22,222 for maintenance of rentable property; the total of the whole heading is £44,198. I have already commented on the heavy expenditure caused by derailments, but both it and maintenance of rentable property are indisputably correct charges against current revenue. The same remarks apply to the expenditure for previous years.

The special expenditure for the year 1920-1921 was £125,156. The most important item in this is £32,544 for arrears of maintenance of track in excess of amount reserved. During the war it was impossible to maintain track up to standard; this was common to all railways. Special allocations were made by the Railway Companies after the war out of revenue, to meet the cost of this; these were insufficient by £32,544 and the balance was charged against special expenditure. I have examined the documents in connection with this, and am satisfied that the sums were spent on maintenance and not either upon renewals or improvements. The next largest item is £9,715, being contribution to staff medical fund, and this is clearly an appropriate charge. The other principal items are losses on Catering Department, sub-division and survey of blocks of land at Beira, and expenses of the Directors’ visit to Rhodesia. These are all fair charges against revenue.

For the year 1921-1922, apart from recurring items such as contributions to staff medical fund, the principal item is £6,736 for Beira wharf, scheme of
reconstruction, re-arrangement and extension of facilities. This forms part of a
general scheme, the total cost of which, £60,000, was spread over five years. The
cost was borne by the Beira Junction Railway Company, the Beira Railway Com-
pany, the Mashonaland Railway Company and the Rhodesia Railways, Limited,
pro rata to the revenue each derived from export traffic through the port. Of
the total, £22,940 was spent on reconstruction of a portion which had collapsed,
removal of buildings to new sites and re-arrangement of new tracks; these are all
fair charges against revenue. Of the remainder, £32,243 was for the extension of
the wharf in timber, including stone pitching, and £4,067 was for the reclama-
tion of foreshore. The Railways claim that these were all works of a temporary
nature, which would be superseded by larger and permanent works, and that the
cost should therefore be liquidated out of revenue, spread over a period of five /
years. The situation has now been changed by the contemplated purchase of the
port assets of the Beira Junction Company by the Port of Beira Development
Company. Amongst the assets will be this wharf, and it should therefore now be
credited to revenue and debited to capital by the Beira Junction Company. That
Company should refund the respective amounts to the other Companies who,
in turn, should credit them to their revenue accounts.

The next most important item is £6,248 for cost of earthworks abandoned
on deviation of line. Prior to 1921–1922 it was not the practice for the Com-
panies to write off from capital the cost of earthworks abandoned. Since that
date they have written off, in addition to the above, £12,974 in 1922–1923 and
£6,400 in 1923–1924. It would appear that the change in procedure was not
unconnected with income tax. The items are not large but embody an impor-
tant principle. The practice at present, when a section of line is deviated or
re-graded, is to charge the cost of the new earthworks to capital and write off
the cost of the abandoned earthworks out of special expenditure. The arguments
which the Railways put forward in defence are that, if they did not write off
the abandoned sections, there would be double capitalisation. For example, if a
nine-mile deviation is substituted for a previous ten miles of earthworks, nine-
teen miles would be included in the expenditure on capital assets, whereas only
nine miles of railway actually exist. A new section of line is being provided out
of revenue in place of the old, and the operation is therefore analogous to writ-
ing out of capital account the cost of the old rolling stock when superseded by
more efficient types. The Railways point out that the British Commissioner of
Taxes allows deduction against revenue on this account, notwithstanding that
such cost has been charged to capital account. On the other hand, the Appellate
Division of the Supreme Court of South Africa has recently given a judgment to
the effect that in respect of income tax no deduction could be allowed to devia-
tions, Whether it is treated by the British Commissioner of Taxes in one manner
and the Supreme Court rules that it should be treated on a different basis in
South Africa does not materially affect the question, so far as this enquiry is concerned. The British Commissioner of Taxes deals with it in accordance with the income tax procedure in England; the Supreme Court interprets the legislation of Southern Rhodesia on income tax. The object of this portion of the enquiry is to ascertain whether capital expenditure is being paid for out of revenue, and for that purpose the criterion must be, not the interpretation of the law on income tax, but the best recognised railway practice. That is, I think, without doubt in favour of writing off the abandoned sections against revenue. The argument that otherwise double capitalisation would result is a very strong one. If those sections are allowed to remain on the books, they do not represent any tangible asset. The analogy with replacement of rolling stock and other assets also adds weight. Renewals funds are for the purpose of replacing not only those locomotives and wagons which are worn out, but also those which have become obsolete. Earthworks are considered in railway practice as being indestructible if properly maintained, and therefore no provision for renewals is made, but they do become obsolete as the traffic becomes too large for them or justifies an expenditure on easier gradients. The whole cost of the new earthworks is charged to capital, but the cost of the old ones is deducted therefrom, so that only the difference between the two, i.e., the actual improvement, is eventually a capital charge. This is precisely the same procedure as is followed when a new and larger locomotive replaces an old one. The argument which has been used, that if sufficient deviations were constructed a completely new line could be built out of revenue, fails for this reason: only the replacement of the old earthworks which have served their purpose but have now become obsolete would be charged to revenue, as is only right and as is done in the case of all wasting assets. The difference, i.e., the improvement, is charged to capital.

This method is that adopted by all the British Railways, the South African Railways and the Inter-State Commerce Commission of the United States. It is backed, therefore, by the authority, not only of British railway accounting practice, but of one of the largest and best run state railways in the world and of a body whose main function is to guard the interests of the public. I think that procedure, which is upheld from quarters differing so widely as those, can be called with justice the best acknowledged practice.

The only items in 1922–1923 which call for comment and have not already been dealt with are £7,745 and £783, being, respectively, amounts written off the / shareholdings in the Zambesi Saw Mills Company and The Rhodesian Native Labour Bureau. I do not think there is any justification, from the point of view of the public, for writing off the cost of shareholdings out of revenue.

In the year 1923–1924, £9,207 was spent out of special expenditure on new minor works of a capital nature. Prior to that all improvements of a capital nature, however small, were charged to capital. If a new bath of an improved
quality was substituted for an inferior one, it was charged to capital. The Board then gave authority to the General Manager to charge to special expenditure new minor works of this nature, costing under £100 each. In theory it is, of course, wrong; every improvement, however small, should be charged to capital, but in practice it is done by nearly every railway in the world, whether owned by the State or privately. The total amount is small and therefore there is no grave objection to it, but it should be limited strictly as to the total amount. It must be remembered, too, that there is no betterment fund on these railways.

This investigation of the miscellaneous and special expenditure shows that the Railways have not been incorrectly charging any considerable sums to revenue which should have been borne by capital. The £60,000 for the Beira wharf scheme, though it may have been a fair charge against revenue when originally incurred, should be charged back again to capital, and I consider that the writing off of shareholdings in companies is also incorrect, but apart from these no adverse comments can be made. On the contrary, I think it only right to say that the Railways have been scrupulous in their observance of the distinction between capital and revenue expenditure.

Appropriations have been made by the Rhodesia Railways to Pensions Liability Account, amounting to £160,000. None of the other Railways have made any such appropriations, with the exception of the Rhodesia-Katanga Junction Company; in their case the amount actually appropriated is not known locally. The Chief Accountant estimates the accrued liability on this account at not less than £500,000 and the annual liability at not less than £50,000. This estimate is based on six per cent. of the pensionable salaries and wages, on the assumption that the sums so appropriated are set aside and accumulate at compound interest. The amounts set aside are still a long way below these figures, and whether this estimate be accepted or not there can be no question that the amounts allocated up to date are not excessive. They are a fair charge against current revenue, as the liability should be met as it is incurred, so that each year bears its proper burden; it is quite wrong to make no provision until the time comes to pay the pensions, because then an unfair burden is thrown on later years. In fact, I think it would be prudent if the Railway Companies adopted the same course as in the case of renewals and entered the liability in their accounts, even if they have no funds to place against it.

PROFITS.

Rhodesia Railways, Limited.
The following table shows the net profits made each year since the war by the Rhodesia Railways, Limited, after interest on debentures and notes and income
and other taxes have been paid, as well as the distribution of those profits and the credit balance at the end of each year after distribution:

**RHODESIA RAILWAYS, LIMITED.**

<table>
<thead>
<tr>
<th>Year ended</th>
<th>Net profit</th>
<th>Reserve for renewals</th>
<th>Distribution of net profit</th>
<th>Credit balance after distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>30th September, 1919</td>
<td>£58,532</td>
<td>£100,000</td>
<td>...</td>
<td>£188,891</td>
</tr>
<tr>
<td>30th September, 1920</td>
<td>£21,995</td>
<td>...</td>
<td>...</td>
<td>£210,886</td>
</tr>
<tr>
<td>30th September, 1921</td>
<td>£45,590</td>
<td>...</td>
<td>...</td>
<td>£256,476</td>
</tr>
<tr>
<td>30th September, 1922</td>
<td>£37,329</td>
<td>...</td>
<td>40,000</td>
<td>£253,805</td>
</tr>
<tr>
<td>30th September, 1923</td>
<td>£58,311</td>
<td>...</td>
<td>40,000</td>
<td>£224,116</td>
</tr>
<tr>
<td>30th September, 1924</td>
<td>£251,148</td>
<td>...</td>
<td>50,000</td>
<td>£361,264</td>
</tr>
</tbody>
</table>

I have already referred to the appropriations to renewals reserve; these were made before the present system of calculating contributions was adopted; no objection can be made to them. Nor can exception be taken to the appropriations to pension liability account.

Until 30th September, 1923, it is obvious that no objection can be made to the dividends paid, nor to the increase of £35,225 in the credit balance. Until and including the dividend paid that year, only three dividends had been paid in the thirty years since the inauguration of the Company, and they totalled altogether £208,000, free of income tax. In October, 1923, also, rate reductions were introduced, involving a surrender of approximately £100,000 of revenue, of which roughly a half could be regarded as the portion relating to the Rhodesia Railways, Limited.

In the year ended 30th September, 1924, a marked change occurred; the net profits rose from £58,311 to £251,148, a dividend of £64,000 free of income tax was paid and the credit balance increased by £137,148. In estimating the relation which these bear to the capital of the Company, I propose to use the figure of £71 for each Rhodesia Railways share because, as I have explained earlier, the stated capital of £8,000 is obviously a nominal figure, and full and adequate consideration was given in return for the £71.

On this basis the ordinary share capital stands at £568,000. The dividend of £64,000 was paid free of income tax, so that it was worth to its proprietors £82,581, or slightly over 14½ per cent., in addition to adding £137,000 to the credit balance.

The argument might be put forward that although these results, when regarded as those of a solitary year, may appear excessive, when previous results are taken into account they are only compensation for the many lean years through which
the Company has passed. But the country suffered as well during these lean years, and the Railway cannot claim to make up the whole of its past dividends out of present earnings. It is now recognised universally that all that railways generally have a right to expect is a fair return on capital invested. This usually includes a margin for fluctuations, to avoid frequent alterations in the tariff, and often a bonus is allowed as well to give an inducement to the company to render good service and develop trade. No controlled railway of which I have knowledge would have been allowed to earn such large sums in proportion to its capital as those just noted, whether distributed as dividend or left to swell the credit balance; or, rather, if it had made them would not have been forced to readjust its rates so as to surrender the bulk of the surplus. In this case the rise in net profits was sudden; it was not possible to expect any reductions until the year was completed and the results known. When the year was completed the Directors decided to make certain reductions; the surrender of revenue entailed thereby, over the whole system, was £100,000. It is not easy to estimate the surrender of revenue entailed in rate reductions, but I have satisfied myself by inspection of the documents that this estimate was computed quite fairly. Of this £100,000, £54,600 is the share of the Rhodesia Railways, Limited, calculated on its proportion of the gross receipts of the whole system from the main traffic heads affected by the reductions.

The Railway Administration defends the failure to surrender more revenue on the grounds that most of the increase was due to causes which might be temporary, such as the carriage of mining machinery to Northern Rhodesia and railway material, machinery and other traffic for the Congo. The increases in net revenue during the eight months of the current year are also due to the same causes, and the argument put forward is that, while the rate reductions would be permanent, if most of these traffics are lost there is a danger that the reduced revenue would not give an adequate return on the capital invested. As against this, however, the Company had a net credit balance at 30th September, 1923, of £224,116, or about forty per cent. of its ordinary share capital on the valuation which I have taken; it is therefore in a strong financial position, and it has gained that position out of the revenues which it had collected from the public. The public, therefore, has the right to demand that those credits should be the first to be used when it becomes a question of making good decreases due to lost traffic in preference to maintaining rates at the higher level. When the latter course is adopted, if the traffic is not lost, the Company gains a lot and the public loses the rates reductions which it would otherwise have gained. If the traffic is lost, the public still loses.

I consider, therefore, that until September, 1923, the profits cannot be considered excessive, but that after September, 1924, as the net gain for that year represented by the dividend and the increase in net balance was over £219,000, a larger surrender of revenue than £54,600 should have been made.
Another feature is the delay in introducing the reductions. The financial year ends in September; by that time the final results are known approximately. By September, 1924, the Board had decided that reductions should be given, and the total amount of revenue to be surrendered had been more or less agreed. Most of the actual reductions were not brought in until the following July, or ten months later. One month and a half to obtain the final consent of the Board and two months and a half to make adjustments with the South African Railways, or four months in all, should have been ample, and it should have been possible to bring in the reductions by the 1st February. The reductions were delayed six months, however, to the detriment of the public and to the gain of the Company. I have seen the correspondence connected therewith, and it is clear from this that the delay was due not to the reluctance of the Board to surrender the revenue nor to any desire to obtain the benefit of the delay, but merely to the retention by the Board of detailed control over the rates. Abnormal delays, which are unjust to the public and hamper the Railways, are bound to occur if rate details have to be discussed with people three weeks distant by post. The important features for the Board are the amount of revenue to be surrendered, any departures from the general rates policy and any points which will affect the special contracts with the big concerns, such as the Union Minière and the Broken Hill Mine. The General Manager should be left to decide any details within these limitations; he is in a far better position to judge than anyone else. It must be understood that I am speaking now of the existing situation where no State control exists over the Railways in Southern Rhodesia.

I am informed that it is the intention of the Directors to institute further reductions in rates, and steps to that end are now being taken.

**Mashonaland Railway Company.**

I give below a table for the Mashonaland Railway Company, showing for each year since the war the net profit or loss for the year and the accumulated net loss at the end of each year:

<table>
<thead>
<tr>
<th>Year ended</th>
<th>Net profit or loss</th>
<th>Accumulated net loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>30th September, 1919</td>
<td>-93,976</td>
<td>1,638,818</td>
</tr>
<tr>
<td>30th September, 1920</td>
<td>-36,409</td>
<td>1,675,227</td>
</tr>
<tr>
<td>30th September, 1921</td>
<td>+42,011</td>
<td>1,633,216</td>
</tr>
<tr>
<td>30th September, 1922</td>
<td>+50,741</td>
<td>1,582,475</td>
</tr>
<tr>
<td>30th September, 1923</td>
<td>+28,470</td>
<td>1,554,005</td>
</tr>
<tr>
<td>30th September, 1924</td>
<td>+177,835</td>
<td>1,376,170</td>
</tr>
</tbody>
</table>

This Company has never paid a dividend since it started. Until 1921 it had a net profit on working in two years only, and consequently has always had an accumulated net loss which went on increasing until it reached £1,675,227 in
that year. This loss had decreased by the 30th September, 1924, to £1,376,170, or, roughly, £300,000 in four years, of which £178,000 is attributable to the last financial year. These losses have been financed by loans from the Rhodesia Railways Trust. In the balance sheet of that Company for 31st March, 1925, the loan is shown at £565,349, and the accrued interest from 1st April, 1919, to 31st March, 1925, at £382,934, making a total of £948,283.

The net profits shown in the above table are the amounts arrived at after deducting the current year's interest on the loan from the Rhodesia Railways Trust. This loan is not a fixed amount, because the Trust acts as banker for the Mashonaland Railway Company.

As in the case of the Rhodesia Railways, no question as to profits can arise until the last financial year. In that year the net profits rose from £28,470 to £177,835. Here, again, I think that the best criterion of the profits which the Company should make in any specific year is a fair current return on the capital invested. Whether that goes, as in the case of a company in a good financial position, to paying dividends or, as in the case of one in a low financial position, to paying off arrears of interest on loans, is immaterial. The current interest on the loans is a fair working charge; they have been incurred in order to provide funds to enable the concern to be kept going. There is no evidence that the losses which the moneys were borrowed to cover were due to mismanagement. On the contrary, they appear to have been due to want of traffic, a necessary concomitant of developing a new country. But, provided the Company is allowed this as a fair working charge, the arrears of interest, from the point of view of the public, should not be cleared off at a greater rate than would be allowed if it was a question of return on capital invested. If the railway were under State control of profits or rates, it would not be allowed to make a larger revenue out of the public merely in order to pay off arrears of interest accumulated in the past. If it is allowed to make the current interest on its debt and the equivalent of a fair rate of interest on its capital invested, it will have been treated very fairly.

The nominal share capital of the Mashonaland Company is £450,000, but when taken over by the Rhodesia Railways Trust each £1 share was re-valued at 12s. 6d. Just as in the case of the Rhodesia Railways, Limited, I consider it fair to take the valuation made at that time, so it should hold good in this case. On this basis the ordinary capital of the Company stands at £281,250. Against this the net profit in 1923-1924 was £177,835. It should be noted that, unlike the Rhodesia Railways, Limited, no provision has been made for pension liability account, but even after a liberal allowance has been given for this, the net profit is out of proportion to the capital.

As in the case of the Rhodesia Railways, Limited, it was decided to make rate reductions in consequence of these results, and so surrender a certain amount of revenue. The proportion of the total £100,000 for the whole system which can
be estimated as borne by the Mashonaland Company is £23,300. The argument as to the possibly temporary nature of the increased revenues is, in this case, stronger. The financial situation is very different; there are no credit balances to fall back on. Even the reserves for renewals are not covered by a corresponding asset. But though, no doubt, such considerations must weigh very largely in the minds of the Directors, from the point of view of the public the latter has the right to expect back a larger share than £23,300 out of net profits of £177,835, when the share capital is only £281,250, even though the Company is not strong financially. The public would certainly get more back under any of the systems of control with which I am acquainted. My conclusion, therefore, is the same in this case as in the previous one, that though the profits up to September, 1923, cannot be considered excessive, a larger surrender of revenue should have been made on the results of September, 1924. The same remarks also apply regarding the delay in introducing the rate reductions. I am informed that in this case, too, steps are being taken to institute further reductions.

**Beira Railway Company.**

The table below shows the net annual results of working and the accumulated net loss at the end of each year for the Beira Railway Company:

<table>
<thead>
<tr>
<th>Year ended</th>
<th>Net profit or loss.</th>
<th>Accumulated net loss.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30th September, 1919</td>
<td>-38,389</td>
<td>59,943</td>
</tr>
<tr>
<td>30th September, 1920</td>
<td>-10,233</td>
<td>70,176</td>
</tr>
<tr>
<td>30th September, 1921</td>
<td>–</td>
<td>70,176</td>
</tr>
<tr>
<td>30th September, 1922</td>
<td>–</td>
<td>70,176</td>
</tr>
<tr>
<td>30th September, 1923</td>
<td>–</td>
<td>70,176</td>
</tr>
<tr>
<td>30th September, 1924</td>
<td>–</td>
<td>88,554</td>
</tr>
</tbody>
</table>

This table gives only an incomplete picture of the results of working, because the interest on the six per cent. income debenture stock has to be subtracted before the net loss for the year is arrived at. During the years included in the table the only interest which this stock has received has been 2½ per cent. in 1922, 1½ per cent. in 1923, plus the additional three per cent. granted subsequently for that year, and the full 6 per cent. in 1924. The whole of the profit still remaining on the year’s working, after the charges prior to the income debenture stock had been met, has to be devoted to the service of that stock; this accounts for there being no profit or loss shown in the table during the latter years. After the income debenture stock has been satisfied, the contributions for redemption of
the prior lien rent charge have to be met before a net profit can be recorded. Nothing was put to this fund until 1924, when, besides the charge for this for the current year, £36,982 was allotted on account of arrears.

The situation of this Company, like the others, has undergone a marked change for the better during recent years. During the war and for some time after, the trade through Beira suffered very much, with the result that the total revenues of the Company fell from over £300,000 in 1912–1913 to £172,666 in 1918–1919. They had recovered by September, 1923, to £363,643, and for the year 1923–1924 reached £452,897. As a consequence, in the last year it has been enabled for the first time to meet the interest on its income debenture stock in full and to make up some of the arrears on its fixed charges. So long as the Company has unsatisfied arrears of prior charge obligations, protected by trust deeds and legislation, and in view of the fact that it is surrendering £14,100 under the recent rate reductions, it is clearly difficult to say that it should have surrendered more, but once these arrears of charges are cleared, as seems probable will occur in the current year, the question will bear a different aspect. From the strict point of view of profits, it was only through the assistance it has received from the Rhodesia Railways that it was able to reduce rates in October, 1923, and again in July, 1925.

**Beira Junction Railway.**

The following table gives the net profit or loss for the Beira Junction Company for each year since the war, and the accumulated net loss for each year:

<table>
<thead>
<tr>
<th>Year ended</th>
<th>Net profit or loss</th>
<th>Accumulated net loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>30th September, 1919</td>
<td>-16,356</td>
<td>139,276</td>
</tr>
<tr>
<td>30th September, 1920</td>
<td>-10,810</td>
<td>150,086</td>
</tr>
<tr>
<td>30th September, 1921</td>
<td>+2,384</td>
<td>147,702</td>
</tr>
<tr>
<td>30th September, 1922</td>
<td>-4,048</td>
<td>151,750</td>
</tr>
<tr>
<td>30th September, 1923</td>
<td>-6,320</td>
<td>158,070</td>
</tr>
<tr>
<td>30th September, 1924</td>
<td>+3,096</td>
<td>154,974</td>
</tr>
</tbody>
</table>

It will be remembered that the capital of this Company consists of £249,959 six per cent. original debentures, of which all but £138 are held by the Beira Railway Company; £121,300 five per cent. debentures, of which £54,000 were issued to the Mashonaland Railway Company for amounts advanced to meet capital expenditure, and £67,300 to the Beira Railway Company for arrears of interest on six per cent. debentures; 423,583 six per cent, cumulative preference shares of five shillings each, all subscribed for by the British South Africa Company, and 250,000 ordinary bearer shares of five shillings each. In addition, there is
a charge of £1,480 a year for redeeming the prior lien rent charge; this charge ranks in front of the five per cent, debentures.

The interest on the six per cent. debentures has been paid in cash since October, 1911. Up to 30th September, 1923, £4,161 only had been paid to the redemption of the prior lien rent charge, but in the year 1923–1924, in addition to the current year’s charge of £1,480, it was possible to make good the whole of the arrears, and the amount credited to this account now stands at £14,801. No interest was earned on the five per cent. debentures prior to 30th September, 1924; in the 1923–1924 net revenue account, for the first time, sufficient was earned to pay the current interest, but it does not appear to have been actually so paid, and the balance shown in the last balance sheet as owing to this account is £35,404. It follows, of course, that no interest has ever been paid on the cumulative preference or ordinary shares. / Here, again, as in the case of the Beira Railway Company, it is clearly difficult to say that excessive profits have been earned during the past financial year. Even if the interest on the £67,300 five per cent. debentures, issued for arrears of interest, is ruled out, there will remain a balance on net revenue account of £6,461 only, of which the recent rate reductions are estimated to absorb £3,900.

The financial situation of this Company will be modified very largely by the arrangements now under negotiation with the Port of Beira Development Company.

**Blinkwater Railway Company.**

The net profit or loss for each year since the war on the Blinkwater Railway, and the accumulated net profit, are given in the following table:—

<table>
<thead>
<tr>
<th>Year ended</th>
<th>Net profit or loss.</th>
<th>Accumulated net profit.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30th September, 1919</td>
<td>£ –</td>
<td>£ 7,702</td>
</tr>
<tr>
<td>30th September, 1920</td>
<td>£ –</td>
<td>£ 7,702</td>
</tr>
<tr>
<td>30th September, 1921</td>
<td>£+694</td>
<td>£ 8,396</td>
</tr>
<tr>
<td>30th September, 1922</td>
<td>£–1,068</td>
<td>£ 7,328</td>
</tr>
<tr>
<td>30th September, 1923</td>
<td>£+3,775</td>
<td>£11,103</td>
</tr>
</tbody>
</table>

The accounts for the year ended 30th September, 1924, are not available at present.

No interest has yet been paid on the £200,000 ordinary shares held by the Beit Railway Trustees. In addition, they have advanced money on open account, the interest on which is limited to the annual net profits of the Railway Company, subject to a maximum of six per cent. per annum. The following table
shows the advances each year since the war and the interest received thereon by the Beit Railway Trustees:

<table>
<thead>
<tr>
<th>Date</th>
<th>Total amount of advance</th>
<th>Amount of interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>30th September, 1919</td>
<td>£208,758</td>
<td>£9,067</td>
</tr>
<tr>
<td>30th September, 1919</td>
<td>£208,000</td>
<td>£2,832</td>
</tr>
<tr>
<td>30th September, 1919</td>
<td>£200,341</td>
<td>Nil</td>
</tr>
<tr>
<td>30th September, 1919</td>
<td>£192,841</td>
<td>Nil</td>
</tr>
<tr>
<td>30th September, 1919</td>
<td>£175,749</td>
<td>£7,447</td>
</tr>
</tbody>
</table>

There is obviously question here of profits. Apart from the ordinary shares, full interest has not been paid during any year on the advances.

This is however, largely due to the fact that the branch has never received any credit for the traffic it has brought to the main line. It has had to be content with the takings on the branch only; the whole of the profit on the traffic which has been brought to the main line by the branch, and which has been created by it, has gone to the main line. This has an important bearing on rates, because, owing to its bad financial position, rates are calculated on the Blinkwater Railway as starting afresh from the junction; in other words, the taper does not continue. The journey on the branch is regarded as a fresh journey, and the public on the branch have to pay a higher rate for the same haul, say from Bulawayo, than if they were situated on the main line. To show the effect which this has on the finances, the gross revenues from traffic on the branch in the year ended September, 1923, were £45,820. It is a fair assumption that the takings on the main line from traffic to and from the branch equaled this figure at least. The ratio of expenditure to receipts over the whole system, in 1923, was approximately 60 per cent., but the cost of working on the main line the additional traffic brought by the branch cannot have been more than 40 per cent. of this, so that the cost to the main line of working this additional traffic cannot have been more than 40 per cent. of 60 per cent. of £45,820, or £11,000, leaving a gain to the main line on this traffic of about £34,000. These figures are only approximate; they do not pretend to do more than show the large proportionate gain to the main line. It is only right and just that the branch should get a substantial credit from this revenue, which it has been the cause of producing, and assuming, as is the case here, that no special service has to be performed at the junction, such as transhipment on change of gauge, or that the construction has not been unusually expensive, both of which might justify a special charge, it is unjust to impose higher rates to make up for the bad financial situation, unless the branch has received a substantial credit on this account. It is also harmful to development.

It would entail too much work to ascertain in the exact amount represented by the exchanged traffic, but on the 1922–1923 figures, if a credit of £15,000 has been given on this account, there would have been sufficient to pay the full
six percent. on the advances and the same on the ordinary share capital. I do not consider, therefore, that the bad financial situation of this Company, in the absence of any allowance, is an adequate reason for fixing its rates at a higher level than for the rest of the system.

Rhodesia-Katanga Junction Railway Company.

No final accounts for this Company are available in this country, subsequent to those for the year ended 30th September, 1919, nor are any details available as to provision for renewals. It is impossible, therefore, to discuss whether or not the profits are excessive. Under the lease to the Rhodesia Railways, Limited, and the Mashonaland Railway Company, the net profit received by the three Companies after meeting the service of the debentures, represented by the yearly rental, have been as follows:–

Net Profits Received by Joint Companies.

<table>
<thead>
<tr>
<th>Year ended 30th September,</th>
<th>Rhodesia Railways, Limited.</th>
<th>Mashonaland Railway Company.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£ s. d.</td>
<td>£ s. d.</td>
</tr>
<tr>
<td>1919</td>
<td>Loss: 3,031 9 5</td>
<td>Loss: 2,020 19 8</td>
</tr>
<tr>
<td>1920</td>
<td>Profit: 2,046 11 1</td>
<td>Profit: 1,364 7 4</td>
</tr>
<tr>
<td>1921</td>
<td>Profit: 14,409 3 5</td>
<td>Profit: 9,606 2 4</td>
</tr>
<tr>
<td>1922</td>
<td>Profit: 14,751 3 7</td>
<td>Profit: 9,834 2 5</td>
</tr>
<tr>
<td>1923</td>
<td>Profit: 14,550 13 10</td>
<td>Profit: 9,700 9 3</td>
</tr>
<tr>
<td>1924</td>
<td>Profit: 21,069 5 8</td>
<td>Profit: 14,046 3 10</td>
</tr>
<tr>
<td></td>
<td>£66,826 17 7</td>
<td>£44,551 5 2</td>
</tr>
<tr>
<td>Less Loss(1919)</td>
<td>3,031 9 5</td>
<td>2,020 19 8</td>
</tr>
<tr>
<td>Profit for six years ...</td>
<td>£63,795 8 2</td>
<td>£42,530 5 6</td>
</tr>
<tr>
<td>Net profit under terms of Lease received by Joint Companies</td>
<td>£106,325 13 8</td>
<td></td>
</tr>
<tr>
<td>Net profit under terms of Lease received by Rhodesia-Katanga Junction Railway and Mineral Company</td>
<td>£106,325 13 8</td>
<td></td>
</tr>
</tbody>
</table>

Judged solely from the point of view of profits, my conclusions are, therefore, that the Rhodesia Railways, Limited, and the Mashonaland Railway Company should have surrendered more revenue in consequence of the results of the year ended 30th September, 1924, and that there should have been less delay in introducing the reductions which were made. The existence of arrears of prior charges protected by legislation prevents the same conclusions as regards the Beira and Beira Junction Railway Companies. The necessity for higher rates on the Blinkwater Railway is not proved, and I consider they should be abolished. No decision can be given as regards the Rhodesia-katanga Junction Company. The Railway Administration states that further rate reductions over all lines are
now in contemplation. I have no information as to the extent of these nor as to
the effect which it is estimated that they will have on the profits.

One direction in which I think improvement could be effected by these
reductions is in equalising the rates throughout the system, instead of having
a higher tariff local rates on the Beira-Salisbury section and Mazoe and Loma-
gundi branches. The legislation which protects the prior charges was enacted
because of the embarrassed financial situation of the two Companies; that situ-
ation was caused largely by losses due to developing a new country. The Rhodesia
Railways grant the Beira-Salisbury section 20 per cent. more than its proportion
of certain receipts, to compensate it for its heavier working expenditure and the
lower graded traffic which it carries. It is to the advantage of the former to do so
in order to enable the other Companies to fix their rates at a lower level than their
results of working would otherwise justify, and thus to prevent the retardation of
development which would be caused by the higher rates in the districts served by
the Rhodesia Railways, Limited, itself. Part of the revenue which the Railways
contemplate surrendering might therefore be applied suitably to reducing the
differences in the local rates by a new basis of division of receipts, with a view
to their ultimate elimination, and thus to abolishing the manifest disadvantages
and inequalities of the present arrangement. The clearance of the arrears of prior
charges will assist this. The whole system, from Beira and Vryburg to Broken
Hill, was originally built by the British South Africa Company for the purpose
of developing the territories under its administration; that object is best served
by regarding the system so far as possible as one whole, in which the weaker
sections are helped by the stronger, just as in any large railway company. The
principle has already been accepted; it only remains to apply it more fully.

GENERAL ASPECTS OF RATES.

Mining Industry.

Turning from the strict point of view profits to the more general aspects of rates,
including their effect on the industries of the country, the case put forward by
Mr. J. R. Fulton on behalf of the Chamber of Mines, for reduction of rates affect-
ing the mining industry, is based on the proposition that if railway rates were
reduced lower grade ore bodies could be worked by the present mines, or that
lower grade mines could be opened. Mr. Fulton points to the fact that no new
mine has been opened by any of the gold mining companies since 1914, as tend-
ing to the conclusion that a point had been reached where the prospective profits
were insufficient to justify the equipment of a mine on a large scale. It is a prop-
erty common to all mines that if working expenses can be reduced, lower paying
ore bodies can worked. It is a process that could be carried on almost indefinitely,
provided costs can be reduced. It is merely a question of where to draw the line.
Mr. Fulton does not produce any evidence that owing to railway rates it is not possible to work as low grade ores in this country as it is in others. He quotes the case of the Shamva Mine as an instance where lower grade ores could be treated its costs were reduced, but it is well-known fact that the Shamva Mine, owing to its peculiar situation, is already able to work much lower grades than is usual. The argument that no new mine has been opened up since 1914 is marred by the fact that since then the rates on all mining supplies, with the exception of explosives and coal, have been reduced materially. The rate on explosives has increased by three per cent. and that on coal by 21 per cent.; the rate on the latter commodity is admittedly a low one. Mr. Fulton given no instance of a mine which would have been opened up if the rates were lower, or which has stopped because the present rates are too high. I do not consider that any case has been made out that the rates charged have hampered the gold mining industry in this country to a material degree.

The only other mineral mentioned is chrome ore, and the objection there made is directed, not to the amount, but to the method assessment. It is significant that no reference is made to either asbestos or mica, and in view of the large increase in the exports of these commodities the only conclusion that can be drawn, in face of this silence on the subject, is that rates cannot be said to be hampering their production and export.

The rates on chrome ore are given in detail in the replies of the General Manager to the statements of case of the Chamber of Mines and the Mining Association of Southern Rhodesia. A basic rate of 20s. a short ton is taken for any distance from Beira within a zone of 145 to 600 miles; if the ore is sold at prices above 75s. per long ton c.i.f., the Railways receive an extra sixpence per long ton out of every shilling per long ton in the actual price above 75s. If the / shipper gets a freight lower than 22s. 6d. a ton, the difference is added to the selling price, and vice versa, but in no case the rate drop below that applied to a selling price of 75s. a long ton. In practice an initial rate of 25s. a ton is charged, and rebates are given on production of documents. If a satisfactory bank guarantee is given the initial rate charged is 20s. a ton, and, in the case of the Rhodesia Chrome Mines, settlement is effected in London.

The rate thus varies with the price and the freight which the seller obtains; the higher priced ore with the shorter haul will pay more railage than the lower priced ore near the end of the zone. The Railways take practically half of the extra profit which the seller gets above 75s. a long ton. It should be noted that no actual complaint was lodged with me against the ultimate equality of these rates.

In theory, no doubt, this method of assessment can be defended on the grounds that the traffic which gets the higher market price can bear the higher agree with Mr. Fulton that it is straining the axiom of what the traffic will bear to its extreme limit. The fact that the ore from one place has a slightly higher
content does not, to my mind, justify its being made to pay a higher rate than ore from a place much further off which has less. The method of rebate bears heavily on the smaller men, to whom the obtaining of a bank guarantee is not always easy, and who may have to stand out of his money for a long time. It is not always easy for him either to obtain the final documents on which his claim for rebate must be based. It mixes the Railway up with shipping freights, with which it has no concern; it is meticulous and offers temptation to fraud. It is right that a rate should be fixed which will enable the Rhodesia Chrome Mines at Selukwe to compete in the world’s markets, as they were the pioneers of the industry and deserve consideration to this degree. To the extension of that rate to a zone to cover all the stations in Southern Rhodesia which load chrome ore, no serious objection can be raised, provided it is free of all conditions as to price and cost of shipping, but the continuance of the present arrangement is bound to keep alive discontent and suspicion.

As regards the mining industry generally, therefore, I do not consider that railway rates can be said to be hindering its development in Southern Rhodesia to-day. The local rate on maize and maize meal is referred to later.

**Agriculture.**

The case for the agricultural industry has been put forward by Mr. C. B. Gwynn, on behalf of the Rhodesia Agricultural Union. I propose to treat first the rates on exported products, as it is obvious that on the capacity to export must depend the future development of the country. New mines opened promote development probably more rapidly else, but, apart from and in the temporary absence of this cause, development must depend on capacity to compete in the world’s markets.

*Maize.* – The first product, in order of importance as a crop, is maize. The rate on export maize is a zone rate for 300 to 600 miles from Beira, varying with the c.i.f. selling price overseas. When this price is 32s. 6d. per quarter or under, the rate is 12s. 6d. a ton; when it is 32s. 6d., the rate is 15s. a ton; and when it is over 37s. 6d. a quarter the rate per ton rises to 17s. 6d. The figures produced by the Rhodesia Agricultural Union for the costs and prices received for this crop may be summarised in the following manner. A farm of 1,500 acres in the maize belt is taken, of which 469 acres are planted to maize. An investment in the farm of £6,500 is assumed, split up into £4,500 as the cost of the land, £1,000 as the cost of the equipment, and £1,000 as the cost of the buildings. The costs of production per acre are taken at the following figures:–

| Native wages and food, depreciation on implements and cattle | £1 | 7 | 6 |
| White labour at £20 per mensem                                      | 10 | 3 |
| Bags                                                                 | 8 | 11 |
If white labour is eliminated, the cost per acre would be £2 7s. 5d., or £1,111 18s. 5d. for 469 acres.

The average production per acre in a good year, 1922–1923, is taken, and the average selling price at Salisbury. The first is 7.83 bags to the acre, and the second is 8s. 6d. a bag. The statement of the Rhodesia Agricultural Union points out that the railway rates affect every bag sold, and on this account it is fair to take the average selling price at Salisbury as an indication of the result on the farmer. On these bases the total receipts are £1,448 16s. 6d. and the gross profits £336 18s. 1d. Against the latter Mr. Gwynn sets the return of interest on the investment of £480; this is actually lower than the Rhodesian bank rate of eight per cent. The result is a deficit of £143 1s. 11d., without allowing for white labour. Analogous figures for 1923-1924, a bad year, show a deficit of £4. I have taken the same figures as chosen by Mr. Gwynn, but have presented them in a simpler form. The fact that a farmer would do better in a bad dry season than in a good one is a common phenomenon; in this case it was due to the fact that the overseas market was high.

These figures as presented are, I think, too bad to be true, that is, to afford a correct indication of the situation. If the 1922–1923 figures represented the actual situation, it would mean that the rate charge would have to be lowered on the whole output by £143, or 10d. a bag, if the farmer is to receive sufficient to pay his interest, leaving out of account any charge for white labour or reward for his own services. At the middle rate of 15s. a ton, it would mean reducing the rate to 6s. 8d. a ton before the farmer could hope to get any real profit on his overseas sales in a good year. The rate would have to be one-third less than the old South African Railway rate, and one which is obviously out of the question. I do not wish to impugn Mr. Gwynn’s figures, which have been drawn from reliable sources, some of them official, but the only conclusion I can draw from them is that, put together and taken as a whole, they draw far too gloomy a picture. Under such circumstances an increase in the export of maize from 399,434 bags in 1919 to 862,703 in 1923 would have been out of the question.

But, whether this picture of a good year is accepted or not, the farmers can certainly contend that they are handicapped by the rates when compared with their African competitors, the Union and Kenya. On the South African Railways the railway rate for grain passed through a country and port elevator is 10s. a ton for any distance carried over 140 miles; if consigned direct to a port elevator, the maximum charge for railway and elevator services is 15s. a ton. On the Uganda Railway the rate is 11s. 2½d. a ton from any station in Kenya to the
port. Against these the Rhodesian farmer has to pay a rate varying from 12s. 6d. a ton when prices are bad to 17s. 6d. a ton when they are good. This is a serious handicap to carry when competing in world markets. The Railways contend that these rates do little more than cover haulage costs over the Beira-Salisbury section. They do not, however, quote any figures in support of this; I recognise the difficulty of doing so, but in the absence of any attempt in this direction it cannot be accepted as a final argument. If it was so accepted, and the idea of any assistance from the wealthier sections of the system ruled out, it would mean that the Southern Rhodesian maize grower must always carry a heavier burden than his rivals, and development must always be checked to that extent.

The sliding scale basis is also open to many objections; I have already mentioned some of these when dealing with chrome ore. If the commodity has a market price which can be fixed by reference to some recognised authority, so that the price regulating the rate is known before carriage has to be paid, or if one or two large bodies only are concerned with the transport, as in the case of the Union Minière and Broken Hill, a sliding scale of rates can often be introduced with advantage, but where many bodies or even individuals may be concerned, and the final selling price is the measure of the rate, and rebates have to be given, the disadvantages outweigh the advantages. That the sliding scale was introduced at the suggestion of the Farmers’ Co-op., Limited, does not alter my opinion on this point. I consider, therefore, that a fixed rate more in line with those given by other African railways, viz., at least as low as 11s. 6d. to 12s. a ton, should be granted. The total receipts from maize and maize meal for export in 1922–1923 were £50,332; in 1923–1924 they dropped to £45,885. Both constituted well under two per cent. of the total revenues of the whole system. A reduction, such as I have foreshadowed, would obviously have no serious effect on the finances.

While I consider such a rate should be introduced, I think it only right to say that I do not consider that any startling increase in development will be caused thereby. No evidence has been presented to me which would tend to show that there is much ground, naturally good and suitable for maize and within ten to fifteen miles of a railway, which is not being used. The drop from 3s. to 3s. 6d. a ton from the middle price will merely increase the zone, from which it will pay to export, by four to five miles, taking the cost of road transport at about 1s. a ton mile. It will also bring in a larger return to those farmers already growing maize, and so give an extra stimulus, but it would be dangerous to exaggerate the total results of these on development. That must come rather from the opening up of new areas by new railways.

**Tobacco.** – The rate for tobacco, both for export and local, is 4th class, with a maximum of £5 11s. 1d. per ton. The export rate is *via* Beira or Mafeking. The Rhodesia Agricultural Union claim that there should be a special export rate *via* Beira, and that this should be lower than the one *via* Mafeking. They produce
no figures to show that the export cannot stand the present rate; they base their claim merely on the fact that tobacco carried through from Northern Rhodesia has the same maximum and does not pay more. This same argument would apply to any zone rate. It can hardly be accepted in face of the increase in export from Southern Rhodesia from 829,608 lbs. in 1919 to 4,997,870 in 1924. The Railways admit that the local rate is ‘perhaps a little high, although there is no definite evidence to show that the traffic cannot stand it.’ It works out at present on the distance from Bindura to Salisbury, 70 miles, at 7.14d. per ton mile. This is a high rate for an unmanufactured article, and although the increase in exports shows that it has not prevented development, it constitutes a large contribution out of the growers’ profits, especially from a rather uncertain crop. I think that there is a case for reduction in the local rate.

_Cotton and Cotton Seed._ – Mr. Gwynn, in his final reply, says that ‘no complaint was made regarding the present rates on cotton and cotton seed,’ and that his remarks were ‘not in criticism of the present rate, but a caution against rate advances in the future.’ I must confess that I fell into the same error as the General Manager in concluding that Mr. Gwynn considered some alterations should be made in view of the words in his first statement of case that ‘cotton rates should be readjusted to give the grower every facility.’

I think Mr. Gwynn is wise in not asking for any reductions in this connection, because his own figures show that at present there is a very ample profit for the grower. The present rate is lower than those in force on the Uganda and Nigerian Railways.

_Citrus._ – No complaint is made as regards the export rate on citrus fruits.

_Slaughter Cattle for Overseas Export._ – The value of Mr. Gwynn’s original case for reduction of the rate on slaughter cattle for export overseas was negated by the fact that no reference was made to the 50 per cent. rebate given on proof that the cattle or the carcases had been exported overseas. This was through no fault of Mr. Gwynn’s, as the rebate had not then been published. His amended case rests on the value of the dressed weight of meat as compared to the railage charge. For large oxen he quotes the value at Durban at £6 per head, dressed weight, as against a railage charge of £2 1¼s., or, allowing the 50 per cent. rebate, £1 7s., from Bulawayo to Durban; the latter equals 22½ per cent. of the value at the port. At first sight this certainly appears a high percentage, but it must be remembered that the length of the journey is very nearly 1,200 miles; the Railways point out that on this mileage the earnings per truck mile work out at 2.59d. and 2.08d. over the Rhodesian system and the South African Railways respectively. In the case of a journey from Salisbury to Mafeking, the rate per truck mile on the Rhodesian system is 2.23d. These rates for earnings per truck mile certainly cannot be called exorbitant; they are, on the contrary, very low. Nor does Mr. Gwynn produce any proof that it is stopping the export. Govern-
ment statistics show the reverse to be the case, that there is a noticeable increase in the export / business. Whatever may have been the situation before the introduction of the rebate, I think no complaint can be maintained at the present figure. A point which must be borne in mind is that the cattle trade has been going through a period of depression all over the world; even in the Argentine it has been felt very strongly, and Rhodesia has been suffering from the same cause.

**Slaughter Cattle to the Rand Quarantine Market.** – The claim for a reduction in rates for slaughter cattle to the Rand is based also on the proportion of the railage to final cost. This varies from 13.5 per cent. to 16 per cent. The defence put forward by the Railways is based again on the truck mile earnings, The distance from Bulawayo to Johannesburg is 681 miles; for the portion over the Rhodesian system the truck mile rate is 4.31d. and over the South African Railways 5.79d. For the longer haul from Salisbury, the Rhodesian truck mile rate is 3.42d. Although not so low as the rate for export overseas, the Rhodesian rates, which were brought in specially at the instance of the Cattle Industry Committee and are appreciably lower than the South African Railway rate, cannot be called excessive. As to the effect on the industry in Rhodesia, it is difficult to give any results, because the market is limited by the restrictions imposed by the South African Government.

**Cattle to the Congo.** – The rate on cattle to the Congo is £15 10s. per short truck for 550 miles, after which the additional charge is 2s. per short truck for every ten miles in excess of 550. At 550 miles the rate works out at 6.76d. per truck mile, dropping to 5.44d. at 794 miles, the distance from Bulawayo to the Congo border. The Railways claim that this is ‘undoubtedly a very low rate.’ While I cannot agree to this definition, I do not think that the rate can be called prohibitive or as hindering the traffic.

**Local Rates on Maize.** – Turning next to the local rates, the rate on maize in bulk is 11th class for 450 miles; then a flat rate of 37s. 6d. is introduced until 600 miles is reached, after which a rate of ¾d. per ton per mile is applied. The General Manager admits that these rates are ‘somewhat high’ and that ‘a case does exist for the reduction of the local rates for maize, kaffir grain and most of the descriptions of produce which are charged at the same rates.’ Mr. Gwynn protests mildly against the extension of any reduction to kaffir grains, mainly on the grounds that they are native grown. I cannot agree to this differentiation in local rates on similar commodities, especially as they, as well as maize, are staple foods in the labour compounds. I think the rate is undoubtedly high and should be lowered.

**Fertilisers.** – The Rhodesia Agricultural Union in their statement of case lay stress very rightly on the importance of fertilisers, especially for the lighter soils which form so large a part of the farming area. The bulk of the fertilisers used in Rhodesia come from Firgrove, a haul of some 1,600 to 1,700 miles by rail. The
factory price varies from £4 10s. to £23 a ton. A medium price, quoted by the Agricultural Department, is £7 5s. The railage to Salisbury, excluding cartage, is 48s. a ton, of which 14s. 8d. goes to the South African Railways for the 867 mile haul to Mafeking and 33s. 4d. to the Rhodesian system for its haul of 791 miles. These rates work out respectively at one-fifth of a penny and ½d. per ton per mile. The Railways state that, though this is a low rate, the commodity is one which might be considered in future rate revisions. In view of the importance to the country and to the Railways of a fuller use of fertilisers, I think this commodity is certainly one of the first to be included in rate reductions. If, however, the rate were reduced to the same as that on the South African Railways, which is obviously a specially low one, it would mean a saving to the farmer of 18s. 10d. a ton, or only 1s. 10d. an acre. It is clear that this is not going to effect any large difference.

The trouble lies in the fact that it is economically quite wrong to haul a commodity like fertiliser 1,600 miles by rail. Mr. Gwynn admits this, but bases thereon a claim for a reduction in the rates on raw materials, which at present are carried at the same rate as fertiliser, the lowest class rate in the tariff. He cites in support of his argument the rates on raw material from Firgrove to Salisbury, but, if it is uneconomic to haul fertiliser 1,600 miles by rail, it is still worse to haul the raw materials that distance. I do not pretend to any knowledge of the manufacture of fertiliser, but the remedy appears to lie in the manufacture of the article locally, fed by raw materials from the shortest route via Beira, Low freights to Beira should not be difficult to obtain on some of the many ships which come there half-empty to load. /

General Considerations. – I have examined above the more important reductions proposed by the Rhodesia Agricultural Union; I do not propose to examine in detail all the remaining reductions which were put forward in that statement, as it would swell this already large report to inordinate lengths, nor would any very practical purpose be served by examining each item.

In order to obtain a strictly impartial view of the railage paid by the farmer on the equipment and maintenance of his property, I asked the Department of Agriculture to prepare a statement for me, showing the cost of equipping a mixed farm of 3,000 acres in the neighbourhood of Salisbury, and maintaining it for four years. The Department very kindly furnished me with the details [...]. This statement shows that the total original cost, including that of the imported material necessary for building a house and sheds, of fencing and of purchase of stock and implements, may be estimated at approximately £1,592, of which £145 10s. 7d. represents cost of railage. Of this £1,592, £182 was for the purchase of oxen, sheep, pigs and poultry, which are assumed to have been bought locally. All the material is assumed as imported via Beira, the wagon to be railed from Durban and the dairy cows and bull from Bloemfontein. £1,410 represents the cost
of the articles railed and £145 10s. the railage on them, that is, the original cost is increased by 11.5 per cent. by the railage. The expenditure on maintenance and further extensions during the first four years is placed at £1,856, of which £1,724 has paid a railage of £180. In this case the railage increases the original cost by 11.7 per cent. I do not think that an addition of 11.5 and 11.7 per cent. to the original cost of items brought a distance of 374 miles, and sometimes more, can be said to be placing such a burden on the industry as to prevent its development. The rates on some of the items, such as agricultural machinery and wagons, are certainly high, and if lower rates were in force the farmer would have more money to spend on developing his property, which would in turn make itself felt throughout the country. Lower rates would, in fact, mean a more rapid rate of development, but it cannot be said in justice that the present rates, so far as they affect expenditure, are actually proving a serious bar.

The list of reductions and concessions which the Rhodesia Agricultural Union claim in their statement is rather a formidable one. It includes the following: Maize for export overseas, local maize, maize to the Congo (for which compensation is to be given to the local growers by lowered short distance rates and to Northern Rhodesian farmers by lowered rates for export overseas and to the Union), slaughter cattle overseas, slaughter cattle to the Rand, slaughter cattle to the Congo, pedigree cattle, tobacco for export and tobacco carried locally, all rates on dairy products, eggs exported to the Congo and local, sunflower seeds, monkey nuts, potatoes, local wheat, flour, stock salt, grain bags, fertilisers, cement, petrol, cartage and storage charges, and concessions on second class passenger fares to the coast. The only rates with which it expresses content are those on citrus, cotton and cotton seed. The Railways’ general defence to these demands, as distinguished from their examination of the individual cases, rests mainly on the financial aspect; that only recently has the financial situation justified substantial reductions and that such reductions have been given, with the result that rates on many commodities and exports are lower than before the war, and that the present improved financial outlook gives a prospect of further reductions to assist development. This improvement in the finances of the Railways has certainly enabled them to reduce their rates in many directions below the prewar level, in contradistinction to most railways, where all rates are still above pre-war figures. As many of these reductions, estimated to cost £100,000, were introduced in October, 1923, when the financial outlook was by no means as good as it is to-day, I think it only right that this should be recorded. A further £100,000 has been surrendered recently in reductions, but I have already stated my opinion that this should have been larger. It is clear, however, that the acceptance of the whole of the proposals of the Rhodesia Agricultural Union would probably impair the financial stability of the Railways or, if it did not actually result in that, would divert to the local farmer practically the whole of the ben-
efits, to the detriment of the other users of the railway, who can claim that they also require some consideration. I agree that from the point of view of development the farmer is the first to be considered as being most in need of assistance, but the mines and the general public cannot be left entirely out of count. The countries, other than Southern Rhodesia, who are served by the railway, also can expect with justice some of the benefits. Nor can the Railways be expected to surrender more revenue than would leave them in a position to pay a fair return on capital invested, and it is evident from my Memorandum of Instructions / that this is also the view of the Government. I have indicated certain directions in which the need for alteration is the most urgent and important; these include the local and export maize rates, the local tobacco rate and the rate on fertilisers. If these demands are satisfied first, it would give the farming industry that priority of assistance in development to which it is entitled. The remaining rate reductions could be distributed more generally amongst the various sections of the community, preference being given to any articles which tend to increase production rather than to general goods. In this respect I am entirely in accord with the Rhodesia Agricultural Union.

In order to obtain a general view of the rates on imported articles as they compare with those in force on other African railways, I have had a series of charts prepared. These charts, which are attached to this report, show the respective charges in pence per 100 lbs. or per ton at the various mileages. I have chosen the rate ex Delagoa Bay as the South African Railways port rate to be charted, because it is over the shortest distance and therefore, from the point of view of what the traffic will bear, is the governing one, the others being adjusted to it. A few rates, such as those on fertilisers, do not lend themselves to charting and so are omitted. On the other hand, I have included charts of some of the more important export and local traffic rates, where they can be suitably treated in this way. It is necessary, however, to add a word of caution as to their application. This can be only of a very general character because the conditions vary so greatly between the railways. For example, the South African Railway has 4½ times the route mileage of the Rhodesian system, its gross earnings are seven times as great, its tonnage is 15 times as great, and each route mile produces three and one-third times as much tonnage, on an average, as one route mile of the Rhodesian system. I am glad to note that in the statements of case both the Chamber of Mines and the Rhodesia Agricultural Union the impossibility of drawing any close comparison between the two systems has been noted, and no attempt has been made to draw unfair inferences from it. On the Uganda Railway, over 60 per cent. of the capital is non-interest bearing and Indian and African skilled labour is used; on the Nigerian Railways no provision is made for renewals, beyond the sinking funds of the various loans and until 1922–1923 even without this they
did not pay their way. A lot of the trained staff is African also and costs much less than it would in Rhodesia.

All these conditions vitiate any close comparison. The charts do, however, provide sufficient information to confirm the statement that, taken as a whole, the Rhodesian rates on imports are higher than those of the other railways. The causes for this can be sought mainly in the same reasons as I have given why no close comparison can be drawn.

It should be noted that none of the public bodies, in their statements of case, have raised the point to which much attention is directed in the public Press from time to time, that the high rates are the cause of the high cost of living. In this I think they have been well advised, because, although this cry is often raised in many countries, when the matter is subjected to examination it is invariably found that even when the rates are high the actual result as reflected in the householder’s budget makes little appreciable difference. The reason is, of course, that the articles which make up that budget, such as food, drink, clothing, boots, etc., are all themselves comparatively highly priced and the railage is consequently bound to be very low in proportion. But, though the result as reflected in the individual budget may be small and is usually negligible, the total difference between low and high rates has to be borne generally by the public and goes to that extent, at any rate indirectly, to increase the general costs.

My conclusions on the subject of rates may be summed up as follows: The rates on imports, taken as a whole, are higher than on other African railways. The rates on the majority of exports are not excessive, but that on maize in particular compares unfavourably with those in force in other competing countries. That the rates are not lower cannot be attributed to mismanagement, excessive reserves for renewals, incorrect application of revenue to capital expenditure or, at any rate until 30th September, 1924, to excessive profits. It has been attributable rather to want of traffic, and that cause is being eradicated rapidly, principally through the increase of traffic with the Congo. The financial results of the year 1923–1924 justified a larger reduction of rates than was actually granted, and the reductions should have been introduced with less delay.

The rates now in force cannot be said to be hampering the development of the mining industry; in the case of agriculture, while the present rates cannot / be said to be preventing development, lower rates would induce a more rapid expansion. The further reductions which I consider justified by the present results could be applied, in the first place, most suitably to the rates which directly affect agriculture, and I have indicated the rates on export and local maize, local tobacco and fertilisers as those deserving first consideration. After that priority has been satisfied, the reductions should be distributed more generally, with preference to other categories which tend to increase production, including therein those affecting the mining industry. I consider radical altera-
tions should be made in the method of assessing rates on chrome ore and that the sliding scale for export maize rates should also be abolished.

COMPARISON OF RATES CHARGED IN RESPECT OF SOUTHERN RHODESIAN TRAFFIC WITH THOSE CHARGED IN RESPECT OF THE TRAFFIC OF OTHER COUNTRIES SERVED BY THESE RAILWAYS.

The class rates on port traffic from Beira and on the Beira-Salisbury section have a sharp taper every 100 miles up to 680 miles, after which the taper is much smaller. In other words, the rate per ton per mile decreases rapidly as the haul gets longer until 680 miles is reached, after which the rate per ton per mile does not decrease so fast. To take the most marked example, the first class rate commences at 11.2d. per ton per mile; at 680 miles it has dropped to 6.712d. per ton per mile, but at 1,460 miles it has only fallen to 4.84d. On the Rhodesia Railways and the Kalomo-Broken Hill section of the Mashonaland Railway there is a sharp taper every 100 miles up to 590 miles, and after that the taper becomes negligible; the rate per ton per mile on the longest haul is practically the same as on one of 590 miles. On class rates 11 to 13, which are applicable all over the system and are the lowest except for rates on special commodities, there is a taper up to 400 miles, after which the rate per ton per mile remains uniform.

It is the general practice in rate making to give a lower rate per ton per mile as the length of haul increases, because the long haul traffic cannot usually stand the same ton mile rate as the short haul. There are exceptions to this rule, such as zone rates and flat rates, but the principle of the taper is the generally accepted basis of all rate systems, and most of the exceptions themselves are framed with the same object of removing part of the disadvantage with which the man with the long haul is saddled. The Rhodesian railway system applies this system up to certain points, but after these it either has a more gradual taper or none at all. The result is to withdraw from the long distance man, at any rate in part, the compensation which he usually receives. The reason for this abrupt change in procedure is the competition of Union ports.

Bulawayo is 673 miles from Beira, so that the most populous portions of Southern Rhodesia get the benefit of the sharper taper on the Beira port rates, whilst Northern Rhodesia and the Congo get very little compensation for their long haul. If a uniform taper was applied every 100 or 200 miles throughout the system, the rate per ton per mile would be much smaller in comparison to the Southern Rhodesia one than it is to-day. The same applies, and with more force, in the case of goods forwarded from Beira on class rates 11 to 13; from Norton to the Congo border the rate per ton per mile remains the same. Southern Rho-
desia from Norton on suffers to a certain extent, but not to the same degree as Northern Rhodesia or the Congo.

On goods forwarded on ordinary class rates from Bulawayo, Northern Rhodesia as far north as Lusaka is, as regards taper, on the same footing as Southern Rhodesia, and on goods in the 11th, 12th and 13th classes as far north as Choma, but to all stations north of these points and to the Congo the rate per ton per mile only decreases very slowly, and so a slight advantage may be said to lie with Southern Rhodesia.

The rates from Union ports to stations on the Bulawayo-Congo border section are compiled by adding the difference between the Beira port rate at Bulawayo and the Beira port rate at destination to the Union port rate to Bulawayo. The object of this is to maintain the differential in favour of Beira throughout this section. The rate from Union ports to points on the Bulawayo-Salisbury section is compiled by adding the local throughout rate from Vryburg, or Mafeking as the case may be, to the South African Railway rate from the port to Vryburg or Mafeking. The local throughout rate mentioned would in this case be the Rhodesia Railway rate. / The effect of this is to give an advantage to the northern line; in the case of Livingstone and Salisbury, which are about the same distance from Durban or Delagoa Bay, the difference on 1st class goods is 33d. per 100 lbs; on 5th class goods it is 13d. and on 10th class goods 3d. per 100 lbs. If the comparison was extended to stations north of Livingstone and east of Salisbury, the difference would get larger, but no reasonable comparison can be drawn. Salisbury is 374 miles from Beira and 1,346 miles from Delagoa Bay; it would be quite wrong economically to encourage imports from a port which is nearly 1,000 miles further away, when there is one within 350 miles or so. No point east of Salisbury can legitimately complain that its port rates from the Union are not as low as those on the northern line. Southern Rhodesia can therefore complain that it is prejudiced as compared with one point only, namely, Livingstone.

Turning to export rates, that on maize overseas from Mazabuka, the nearest maize growing station in Northern Rhodesia to the coast, is 337d. per ton for a haul of 1,191 miles, The 300 to 600 mile zone, which covers practically the whole of the maize growing areas of Southern Rhodesia, has a rate varying from 150d. to 210d. a ton. In Portuguese East Africa the rate for export ranges from 75d. a ton for a haul of 18 miles to 143d. for a haul of 183 miles. Southern Rhodesia here is more favourably treated than her neighbours.

On maize and maize meal for export to the Union, Rhodesian rates apply as far as Mafeking, after which South African Railway rates are in force. The rate from Bulawayo to Mafeking is 210d. per ton for 492 miles, and from Salisbury 240d. for 791 miles. The next highest rate, which includes the Mazoe and Sinoia lines, is 270d. In Northern Rhodesia the lowest rate is 360d. per ton for a haul of
1,010 miles from Mazabuka, and in Portuguese East Africa it is 300d. for a haul of 982 miles. The advantage, if any, lies with Southern Rhodesia.

On maize for export to the Congo, the ordinary rate for maize in bulk is charged; that is to say, rate 11 for hauls up to 450, 37s. 6d. a ton for hauls from 451 to 600 miles, and ¾d. per ton per mile for hauls longer than that. The longest haul in Northern Rhodesia is 269 miles from Mazabuka, for which the rate is 358d. per ton. The nearest point in Southern Rhodesia may be taken as Bulawayo, with a haul of 787 miles, for which the charge is 590d. From Salisbury it is 815d. per ton for a haul of 1,086 miles.

Southern Rhodesia in this case stands little chance of competing in the Congo with Northern Rhodesia. The Agricultural Union state that they consider a maximum of 540d. to 600d. a ton should be imposed, 'which would bring the 'maize belt' in competition with Northern Rhodesian growers for Congo trade, and yet give the northern growers 2s. to 2s. 6d. (presumably per bag) protection on the geographical position; or grain traffic to the Congo should be treated as export and rated accordingly.' The statement continues that 'Northern Rhodesian growers have an outlet for surplus to Beira at 2s. 9d. to 3s., and to Mafeking for 3s.' This again presumably means per bag. At first sight this appears reasonable, but if examined more closely it will be found that at the present rates the Northern Rhodesian farmer exports practically nothing overseas and has no sale in Southern Rhodesia, except at Wankie; the rate of 450d. per ton for hauls of 451 to 600 miles allows the 'maize belt' to compete with him at Wankie, although the former has a much longer haul. The only markets thus left to him are his competitive share of Wankie, his local mines and the Congo; the last market is limited and the Northern Rhodesian farmer can claim that it is his natural outlet, while so far as Southern Rhodesia is concerned it would be an artificial one. He might with great justice complain if special rates were fixed which allowed farmers three or four times as far away to compete with him in what is not only his natural market but practically his only outside one.

The complaint of the Agricultural Union regarding the half-rate concession recently granted to pedigree cattle imported from the Union of South Africa into Bechuanaland, Rhodesia or Portuguese East Africa, was based on the misapprehension that the concession also applied to such stock sent from South African Railway stations to the Congo.

The coal rates from Wankie north are considerably higher than those to the south. The ordinary rate to the north ranges from 8s. 8d. a ton to Livingstone, or 1.39d. per ton per mile, to 37s. 4d. a ton to Bwana Mkubwa, or .80d. per ton per mile. Special agreements with the Union Minière, Bwana Mkubwa, and Broken Hill mines are in force, under which the price of the carriage of coal and coke as well as copper varies with the price of copper. The lowest figures under these are £1 12s. a ton for the Union Minière and Bwana Mkubwa, or £1 8s. for the latter
/ when 30,000 tons or more is carried in the year. The lowest figure for Broken Hill is £1 4s. 6d. per ton. All of these range between .6d. to .67d. per ton per mile, and if copper is above £61 a ton they are higher. As against this the rate south starts at 2d. per ton per mile, drops to 1d. at 50 miles, and thence by various stages to .4d. at 300, at which figure it remains. Bulawayo is the first point on the south line to use any appreciable quantity of coal, and the rate there is .47d. per ton per mile. Practically all the larger mines in Southern Rhodesia are more than 300 miles from Wankie, and so get a rate of .4d. per ton per mile. The rates to Southern Rhodesia are thus more than a third less than the special rates granted under agreement to large consumers in the north.

The only mine in Southern Rhodesia using coke in any quantity is the Falcon at Umvuma. The rate from Wankie is 25s. a ton or .8d. per ton mile for a haul of 377 miles. The rate under the contracts with the Union Minière and Bwana Mkubwa again varies with the rate of copper, but is never less than 40s. a ton or .83d. and 86d. a ton mile for hauls of 575 and 559 miles respectively. Thus, despite the special contracts and the longer mileage, the rate to Southern Rhodesia is always lower, and if the price of copper is high the difference may become very marked.

To summarise, it will be seen that only in one respect and at one point, viz., the rates from Union ports to Livingstone as compared with those to Salisbury, is Southern Rhodesia prejudiced. In all class rates Northern Rhodesia and the Congo do not receive the compensation which in ordinary practice is given to long distance traffic; in maize traffic they certainly receive no advantage, in fact it is rather the other way round; their coke rates are higher and their coal rates are over 50 per cent, in excess of those granted to Southern Rhodesia.

**CHARGE FOR CARRIAGE OF GOVERNMENT MAILS.**

The rate charged to the Southern Rhodesia Government by the Railways for the carriage of mails is £7 per mile per annum. It was raised from £5 per mile per annum as from October, 1921, to compensate for an increase of 21 per cent, in weight carried as compared with 1912, when the last test had been carried out, and also for the increase in the costs of operation.

At the same time the Government charges to the Railways for the maintenance of railway telegraph wires in Southern Rhodesia were increased by 20 per cent. on account of larger costs.

The Railways state that, when tested in April, 1922, the total amount paid per annum by the Government, namely, £8,136, represented at that time a payment at approximately 20 per cent, less than half parcel rates.

The charges for the carriage of mails are usually a matter of special contract between the Post Office and the Railways, on account of the large volume to be
handled and the special treatment required. In some countries they are regulated by legislation.

*Prima facie* a rate of 20 per cent. less than half parcel rates does not appear an excessive charge, nor to compare unfavourably with the South African Railways’ charge, which I am informed is £11 per mile. The mail matter carried by the latter is much greater, but no figures are available to me as to the amount carried on those lines, and it would be too much to ask that Administration to carry out special tests in order to supply the information. Also, conditions vary so much in each country that even when the figures were obtained no good criterion would be obtained. Furthermore, these rates are the result of arrangement and are fixed by the two parties at special prices, bearing no fixed relation to the amount carried, work done, or expense incurred. It is therefore clearly impossible to say definitely whether the rate is or is not excessive. Any change in the charges is also liable to work to the ultimate detriment of the Post Office, because the present scale takes no account of the amount to be carried, which is always increasing.

PORT OF BEIRA.

Beira is at present purely a lighterage port; ships lie in the main stream of the river, while the lighter wharves are situated on both sides of the Chiveve Creek. The rise and fall of the tide is approximately 20 ft., and the ebb tide runs, at its maximum, at about five knots. At ordinary high tide ships drawing 24 ft. can enter the port, but those of greater draught must wait for spring tides. The anchorage, although a long one, is somewhat constricted, and ships have not much room in which to swing to their anchors. / The harbour and the Customs wharf are under the authority of the Mozambique Company and not the Railways. The exports and most of the rough import goods pass over the Railway wharf, but the majority of the general import goods must go through the Customs wharf. After sorting and checking there the goods for up-country are trolleyed round by the forwarding agents to the Railway goods shed, and until then the Railways have nothing to say to them. A few trucks are loaded direct at the Customs wharf. The water in front of the Railway wharves is very shallow, and consequently the lighters, which usually draw 4 or 5 feet, are aground for three or four hours at low tide.

The Beira Boating Company undertakes the lighterage for all steamship companies using the port, except the German line, who do their own. The handling of goods on the Customs wharf and in the Customs shed is done by the same firm, but again with the same exception.

The port of Beira has a bad reputation both with the shipping firms and with the inhabitants of Rhodesia. The former complain of the delays to steamers, in consequence of which they have been forced to charge higher freights, and, in
some cases to avoid the port; the latter complain of the delays to goods in transit, entailing larger interest and insurance charges, loss of markets and dislocation of business. That there has been on many occasions serious congestion and delay, and that it is liable to occur again, is not contested by the Railways and may be taken for granted. The first point, therefore, is to find out how far the Railways are responsible, and to what extent the steps which they are taking will remedy matters. The idea that the Railways have full authority in the port is very widespread. It finds expression in the statement of the Association of Chambers of Commerce in the following words:—

‘The Rhodesian Railways under concession control the Railways in the Mozambique Company’s territory and the port of Beira in so far as the handling of traffic is concerned. In actual practice, apart from ordinary Customs precautions by the Portuguese authorities, the working of the port has always been, and is now, entirely in the hands of the Railways.’

It is strange that a public body, which has on several occasions sent sub-committees to report on the working of the port, should be so badly informed, and it is not surprising after this that the general public remain in ignorance on the point. The control of shipping in the harbour, the dredging, stevedoring and lighterage are quite independent of the Railways; in the case of goods passing over the Railway wharf, until the packages are placed from the lighters in the slings of their cranes, they have no control whatever, and in the case of those using the Customs wharf they have nothing to say to them until the cases are handed over at the goods shed and consigned up-country. At the most they can only be accused of being responsible for the delays between ship and Customs wharf through delay in dealing with lighters at their own wharf, as these lighters could then be released earlier for other traffic. For delays at the Customs wharf and between the Customs wharf and the Railway goods shed they cannot be held even remotely guilty. The importance of this lies in the fact that practically all general goods pass over the Customs wharf, and these are the consignments about which most of the merchants’ complaints arise. A striking instance occurred just before my visit to Beira. Complaint was made to the Government that goods landed from the s.s. Gloucester Castle, which cleared on the 12th April, had not reached Salisbury by the 14th May. On investigation I discovered that this ship had discharged 612 tons and the whole of this cargo, with the exception of one motor car and two lorries, had gone to the Customs wharf. There had been no undue delay in the despatch up-country of any of these three vehicles. The delay to the goods about which complaint had been justifiably lodged was due to congestion on the Customs wharf. I have dealt with this question first, as it is important that the popular misconception on the point should be corrected.
Leaving aside for the moment the question of the general adequacy of the facilities, three points were emphasised by the representatives of the shipping firms at Beira, in my interview with them and in their statement, as being necessary to obtain the best out of such facilities as existed. On all these they had arrived at a satisfactory agreement with the Railways prior to my arrival. The first was the method of sorting such import cargo as passed over the Railway wharf. The previous practice had been to check, sort and load to destination each consignment as it came up in the slings from the lighters. The delay caused thereby to the / lighters is obvious. The Railways pleaded that they were compelled to this course by the Portuguese Customs authorities, who insisted that nothing could be brought ashore in a non-Customs area unchecked. The Railways have now obtained their consent, subject to the whole area being fenced, to the goods being carried direct in trucks to a dumping ground, where all the operations of sorting, checking and loading to destination will be carried out. The dumping ground was being laid at the time of my visit and the fencing was in course of erection. The saving of time in the clearance of lighters which will result from this procedure will be considerable. Whether or not the Railways could have obtained this concession earlier from the Portuguese authorities is difficult now to determine and is no longer of great importance.

The second point was that the Railways should work double shifts on the import cranes. The Railways have agreed, and have established a continuous service from 6 a.m. to 6 p.m. They also inform me that they are prepared, when necessity arises, to put on a third shift. It is only fair to the Railways to state that the original correspondence shows that they themselves put forward this proposal in October, 1923, but the other parties did not then agree. Also, the overtime for Customs authorities thus engaged is being paid half by the Railways and half by the Beira Boating Company, and not by their employers.

The third point was the provision of another trolley line, so that three cranes instead of two can be used for the dispatch of chrome. This has now been laid.

While these alterations will no doubt improve the handling of export cargo, and of such import cargo as passes over the Railway wharves, and will benefit indirectly the handling of general goods by allowing better work to be obtained from the lighters, they cannot do anything to relieve the congestion on the Customs wharf, which, as I have said above, is the principal cause of delay to general goods. That congestion is caused by lack of space and lack of shedding. The sheds also are of bad design, having only one entrance. In the past 20 years not only has there been no increase in shed accommodation, but one shed has actually been taken from the wharf authorities and allocated to the Port Captain.

So long as the present arrangements and control obtain, it would be unwise to anticipate the provision of adequate accommodation; the new Port of Beira Company should be able to effect an improvement, but it remains to be seen
what it can do. The only hope for the immediate future lies in gradually diverting to the Railway wharf the surplus of imports, leaving to the Customs wharf only so much as it can handle with despatch. A move in this direction is being made, and it is intended shortly to divert to the Railway wharf the whole import cargo from one ship, as an experiment. If this is successful, it will justify the extension of the practice, and so afford a solution of the problem.

I attach great importance to the need for proper dredging. The amount performed now is quite inadequate, and the objection of ship owners to the port is in part due to this. The need for dredging applies not only to the anchorage and bar, but also to the Chiveve Creek, where the lighter wharves are situated. I am informed that there used formerly to be from 3 to 4 feet greater depth of water at the wharves than now. Great care will, however, have to be exercised in any dredging undertaken in the creek, so as not to imperil the piles supporting the wharves, and for this reason it will probably never be possible to regain the whole of the depth which has been lost. Now that the new Port of Beira Company has been definitely charged with the responsibility for dredging, there should be a marked improvement in the amount performed.

It remains to discuss how far the Railway wharf, when the additions now proposed have been completed, will be adequate to cope with the traffic which may be anticipated from the countries served by the port.

At present the Railways have a wharfage of 905 feet and 94,980 sq. feet of warehouse area. On the wharf are eleven steam cranes of modern design, and the layout of the lines to serve the wharves is satisfactory. Of the eleven cranes six are, in normal times, detailed for export and five for import. When heavy despatches are taking place, this is varied; eight would probably be engaged on exports and only three on imports. The Railways estimate that, working an eight hour day, this number of cranes can deal with the cargo of six ships, four loading and two discharging. This allows two cranes to each of the four ships loading and three cranes to the two discharging. The rate of handling the different commodities varies; with maize one crane can handle about 300 tons in eight hours, with copper about 250 and with chrome about 400 tons. Thus, on the assumption / that two of the ships were loading maize and the other two chrome and copper, each would be loading about 600 tons a day, which may be considered a fair rate for one ship. With smaller ships and mixed loading the rate would be lower; three cranes would then be occupied in handling the cargo from the two ships discharging. A good deal would, of course, be passing over the Customs wharf. The effect of working 12 hours instead of 8 may be taken as causing an increase of about one-third, because for various reasons, such as changing over, drawing full and replacing empty trucks, and tides, full use of the extra hours worked cannot be obtained. On this basis a third ship loading chrome and copper and a third loading maize could be managed.
Steps are now being taken to add another 500 feet of wharfage, equipped with four cranes. The practical effect of this addition may be taken as the equivalent of two additional ships, when working eight hours a day, or three, when working continuously from 6 a.m. to 6 p.m. To summarise, the wharf is now competent to handle the cargo of six ships during normal hours, or of eight when working twelve hours a day; when extended, it will be able to handle the cargo of eight ships during normal hours, or eleven ships on a twelve hour basis.

During the past heavy traffic season it was not uncommon to have more than eight ships in the harbour for cargo at one time, and at times there have been ten or even more. The maximum was thirteen, but some of these were not discharging or loading appreciable quantities. Eight ships at a time cannot therefore be regarded as an abnormal number to expect at the present time; during the coming maize season the wharf will only be able to meet this situation by working an extra shift, and the proposed extension will only just allow for the same number during normal working hours. The only margin it will possess will be that of working longer hours. This remedy is not altogether a desirable one, although, of course, it must be used when necessary; it is expensive and proportionate work is not obtained from it. As a margin for the increase in traffic which may reasonably be expected, it is quite inadequate.

Looking at the problem from another point of view, the figures for the total tonnage passed over the Railway wharf during the years 1920 to 1924 are as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Total tonnage</th>
<th>Percentage of increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920</td>
<td>229,186</td>
<td>–</td>
</tr>
<tr>
<td>1921</td>
<td>262,192</td>
<td>14 per cent.</td>
</tr>
<tr>
<td>1922</td>
<td>273,069</td>
<td>4 per cent.</td>
</tr>
<tr>
<td>1923</td>
<td>323,713</td>
<td>19 per cent.</td>
</tr>
<tr>
<td>1924</td>
<td>426,550</td>
<td>32 per cent.</td>
</tr>
</tbody>
</table>

The increase in four years has been 86 per cent., or an average of 21½ per cent, per year. The rise in 1924 would have been still more marked, had it not been a bad maize year in Southern Rhodesia. The maize shipments were over 50,000 tons less during the last seven months of that year than during the same period of 1923. Had the maize crop been even a normal one, the rise in tonnage would have been over 45 per cent.

Taking the important export traffics* in detail, chrome has risen in the four years mentioned from 50,857 to 157,455 tons, or 210 per cent; copper from 25,807 to 83,144 tons, or 222 per cent., and asbestos from 14,515 to 25,374 tons, or 75 per cent. Lead is the only important mineral which has fallen off, the tonnage having dropped from 16,305 to 8,141, a decrease of about 50 per cent.

* Annual reports of General Manager.
This is, however, unimportant compared to the other minerals, and its place may be taken by zinc. As regards the others, although I understand there is a limit to the world’s demand for chrome, it would be unwise to assume, in face of the steady rise which has taken place hitherto and the possibility of finding new uses for it, that the demand for ore from Rhodesia is suddenly going to stabilize at the present figure. In copper there is every chance of a large increase from the mines in Northern Rhodesia, quite apart from what may be anticipated from the Congo. In the case of asbestos there appears to be no reason to expect that the output should not go on increasing at the same rate. Maize has fluctuations, but over a period of years there is a large increase. Throughout the countries served there has been a much larger acreage placed under cultivation, and the result of his will be seen as soon as a good season occurs, when undoubtedly the figures for 1923 will be passed. / 

The Railways do not deny that the present provision of wharf accommodation is inadequate; it is tacitly admitted, in fact, by the request which they made a year ago to the Mozambique Company to be allowed to build an extra 380 feet of wharfage, now altered to 500 feet. This amounts to an increase in capacity of about 40 per cent., or less than two years’ increase according to the standards of the last four years. If the progress of the last year, or even of the last two years, is maintained, the new wharfage will barely suffice for the increase which will have taken place by the time it is constructed, i.e., the season of 1926–1927, and will be inadequate for the traffic of 1927–1928. It is true that it will be possible to get more work out of the new wharves, as a certain proportion of the length, at any rate, will be in water, which will allow lighters to be worked at all states of the tide. But this does not constitute a large margin for contingencies, and the Railways themselves do not calculate that their average capacity will be increased by more than 40 per cent.

I do not therefore regard the present construction proposal as more than the minimum required to deal with the requirements of the next two to three years; beyond that there is no margin for the expansion of trade, except through the expedient of working extra shifts. In his speech as Chairman at the General Meeting of the Rhodesia Railways Trust, Sir Henry Birchenough is reported to have referred to the extra 500 feet of wharfage as ‘the first section of a large scheme of construction.’ From this it would appear that the Board are also aware that the provision of this 500 feet will not fulfil requirements.

The first thing, therefore, now that the negotiations with the Port of Beira Development Company are completed, is to push ahead with the construction of the new extension, so as to be ready for the opening of the 1926 maize season. There should be no great difficulty in accomplishing this, provided the work is put in hand early and is not delayed further by negotiations. I class the importance of efficient dredging as about on a par with that of more wharfage, and I
I am glad to see that at the same meeting it was stated that this would be taken in hand. I consider that it is a matter of first importance that the question of further extension should not be allowed to wait for the completion of this section. Plans and arrangements should be prepared and any necessary approval obtained well in advance, so that construction is not delayed. Otherwise in three or four years’ time the state of affairs at the port will be little, if at all, better than it is to-day. The form which the further extension should take belongs more properly to Part II. of this report, and is fully discussed there.

As regards the responsibility for the past and present inadequacy of the port, the Railways at present have a wharfage of 905 feet and 94,980 square feet of warehouse accommodation. In 1912 they had 378 feet of wharfage and 41,100 square feet of warehouses. In 1912 57,694 tons were landed and 64,762 shipped at this wharf, a total of 122,456 tons as against 44,734 landed and 381,816 shipped in 1924, a total of 426,550 tons. Thus in these twelve years there has been an increase of 248 per cent. in tonnage handled, of 139 per cent. in wharfage and 131 per cent. in shedding. The facilities have obviously not kept pace with the tonnage to be moved, unless those available in 1912 were much in excess of requirements. This was clearly not the case, as shortly afterwards a scheme of extension was commenced.

The reason which the Railways plead for not having kept abreast of the requirements of the port is that under the Van Laun concession the whole of the railways and harbour works could be expropriated in 1926, the price to be paid being the capital sum which at five per cent. produces an annual return equivalent to the average of the net receipts of the three previous years. If this appeared prejudicial to either party, the indemnity payable might be fixed by agreement or by arbitrators. If the arbitrators did not agree, an umpire was to be appointed by the Portuguese Supreme Tribunal of Justice. The capital sum could be paid down or in annual instalments, also with interest at five per cent., at the choice of the Government. No mention is made as to the amount of the annual instalments. The dates for expropriation were 1916, 1926 and so on. Harbours are admittedly works which take a long time to pay an adequate return on moneys invested.

The Railways contend that under the concession new harbour works would have become liable for expropriation long before the net receipts from them could, if capitalised according to the terms quoted, represent the cost of their construction; that, if resort had been had to arbitration, the decision in the final event would have rested with a Portuguese judge, and that, even if an adequate sum had been fixed by arbitration, the compensation could have been paid by annual instalments, the sum paid each year being entirely at the option of the payer, who was therefore at liberty to fix them if he chose at ludicrously small amounts. They claim that it would have been extremely difficult, if not impossible, to raise money for a large harbour scheme on such conditions. Their
attempts to provide further lighterage berths had been negatived by the refusal of the Mozambique Company to sanction the proposal put forward about two years ago to add another 380 feet, the cause of the refusal being the concession granted to the Port of Beira Development Company.

The force of these contentions cannot be denied.

ROLLING STOCK.

The shortage of rolling stock forms a subject of complaint in the statements of case of the Chamber of Mines and the Association of Chambers of Commerce. In the former a list of the delays caused to the Wankie Colliery by the shortage of trucks is given; in the latter no details are supplied; delays in the past are referred to in general terms and the fear is expressed that the new stock, notified publicly as on order, will be inadequate to meet the expansion of traffic. The Rhodesia Agricultural Union states that the Railway Administration has in the past been considerate in handling seasonal traffic with little delay, although instances have occurred where truck shortage has jeopardised the trade in grain at other than the principal marketing centres. It also expresses the fear that the rolling stock now on order will not fulfil the requirements of expansion.

The General Manager in his reply on this subject admits that ‘the tonnage of traffic which the Railways are handling at the moment is not far from our maximum effort with existing facilities,’ that ‘there is more traffic offering than we can at present accept,’ and that the 12 Garrett engines, 250 steel bogie trucks and 25 bogie cattle trucks on order will enable the Railways to deal adequately and without delay with the extended traffic of 1925–1926, but with no great margin for further expansion. He states that ‘fresh orders on a generous scale are now being considered, and it is certain that demands for a large number of additional engines and trucks will be sent to London shortly.’ He admits that the Railways cannot supply sufficient transport to meet the full requirements of the Wankie Colliery, which includes making up the arrears caused by washaways and heavy rains.

In order to ascertain the situation as it existed before the dislocation of traffic in January of this year, I obtained statements from the Wankie Colliery to show how the truckage which they required had been met in the last two years. These statements show that in 1923 54,000 tons of coal and 117,738 tons of coke were required by the Union Minière, and 54,176 and 118,001 tons respectively were supplied. In 1924 51,500 tons of coal and 130,872 tons of coke were required and 52,255 and 131,109 tons respectively were supplied. This is clear evidence that until the end of 1924 the Colliery obtained all the truckage it
required; nor does it make any complaints on this score prior to that date. The Rhodesia Agricultural Union statement also makes no serious complaint as to the past; on the whole, in fact, it gives a good certificate to the Railways. The only definitely condemnatory statement is from the Association of Chambers of Commerce, but as it advances no facts in support of its accusation, which is itself of a most general character, it is impossible to accept it against the statement of the Rhodesia Agricultural Union and the actual figures in the case of the Wankie Colliery.

Truck supply is a fruitful cause of complaint on every railway, and especially those with seasonal traffics. The traffics on the Rhodesian system are less seasonal, taken as a whole, than on most tropical railways, but even in its case the rise and fall is considerable. It is enabled to adjust the balance to a certain extent by accumulating stocks of chrome ore at Beira, and so restricting that traffic during the maize season. No railway can be expected to carry the full equipment for the peak load; otherwise the stock would lie idle during the rest of the year, with considerable loss to the railway, and hence, indirectly, to the public. What it can be expected to do is to carry the seasonal traffics within a reasonable period so as not to lose markets or expose produce to the weather. It is evident from the statement of the Rhodesia Agricultural Union that the Railways have succeeded on the whole in the past in this respect, and the figures from the Wankie Colliery show that their demands have been fulfilled, too. Nor are there any complaints regarding chrome ore. I think, therefore, that the Railways may be considered as having complied with their obligations in this respect until the end of 1924.

The situation changed with the new year. The washaways and heavy rains dislocated the traffic arrangements seriously; besides the actual stoppages much less work was obtained from the equipment. The increasing traffic demands added to the troubles, with the result, as confessed by the General Manager, that the Railways are still unable to meet the full demands of the Colliery at present.

This critical situation will last until the end of the year, when the first of the new engines is expected to be on the road, but full relief will not be felt until the end of March, when all the new stock ordered should be in service. This, again, will only afford temporary relief; the increasing demands of the Congo and the new ballasting programme will both make heavy demands, and the new orders which are being sent Home shortly should make full provision for these.

It is also important that these orders should be despatched without delay, because, as shown by the time to be taken in the delivery of the locomotives now on order, it is not safe to calculate on engines being available for service in less than nine months to a year from the time of ordering.
ADMINISTRATIVE ORGANISATION.

One of the points to which my attention was directed in the Letter of Instructions was whether, having regard to the requirements of mining, farming, commerce and of the general public, the equipment and administrative organisation of the Railways produce the best commercial results.

The question of equipment has just been dealt with. As a result of my examination of working expenditure and administration, I have already recorded my opinion that the system is generally managed and operated with a good measure of efficiency, and that such points as I had had occasion to criticise were already the objects of special attention by the management. The points to which my criticisms were directed in particular were the necessity for reducing the stocks of stores held, for the introduction of the divisional system of operation, and for the strengthening of the track:

In regard to the port of Beira, I have stated that the present administration leaves much to be desired, in particular in regard to imported goods (but for this the Railways can be held responsible only to a partial degree), that there is an urgent need for proper dredging, that the present wharfage facilities are inadequate, and that the additional 500 feet proposed can only be regarded as the minimum required to deal with the requirements of the next two or three years, after which further extension will be necessary.

I place the need for more equipment, for dredging, for strengthening the track, and for further wharfage at Beira in the first order of urgency. Nothing should be allowed to stand in the way; failure to make provision may, and in all probability would, have most serious results.

In the second order of urgency I place the need for safeguarding the railway where it crosses the Pungwe. My reason for placing it in the second category is that while grave inconvenience is caused by a complete interruption of traffic, especially for such a long period as twenty-four days, the congestion can in time be worked off. The effects of continuous derailments last for several months; the effects of want of dredging and equipment are ever-present as long as the want lasts. Steps should certainly be taken to cure the trouble at the Pungwe, but it should not be allowed to take precedence of the other urgent needs, such, for example, as that for strengthening the track. I am laying stress on this point because it was the latter and not the former which was the main cause of the congestion in the early part of this year. When the Pungwe overflowed during last wet season, the line was breached in several places between miles 32 and 37, and traffic was suspended from the 4th February to the 28th February. It had been breached previously in 1918 and 1923. The trouble is due to a variety of causes; in addition to the flooding of the river itself, which is at its maximum about fourteen miles in width and several feet deep, the effect is increased if
it coincides with high tides. The channel of the river is very unstable, and has shifted under the main bridge since its erection. It is also considered by well-qualified persons that the flooding is not caused by water from the catchment area of the Pungwe alone, but is augmented by the Zambesi overflowing in heavy rainy seasons the low watershed between it and the Pungwe. [...] 

An expenditure of £11,000 as a first instalment has been sanctioned by the Board; with this it is proposed to construct two additional 100 feet spans and raise the bank at the place where it was overtopped last season. This work will be completed before the next rains. The final scheme is, at the time of writing, in course of preparation; when it is completed it is estimated to cost roughly £30,000, including the £11,000 referred to above. The necessity of providing funds for this purpose has been recognised by the Board.

ESTIMATED RESULTS OF WORKING THE PORTION OF THE SYSTEM INSIDE SOUTHERN RHODESIA.

In order to ascertain whether that portion of the railway system contained within the boundaries of Southern Rhodesia might be considered self-supporting, the Railway Administration has prepared the statement given in Appendix XL (not included). This statement was submitted to me during the various stages of its compilation, and I agreed to the final results before they were entered. Where it has been possible to allocate operating expenses at all definitely, this has been done; where it has not been possible, a division based on mileage has been made. The same general principle has been followed in regard to other expenditure. I have already explained how the revenue from goods and mineral traffic was estimated. In the case of passenger traffic it was possible to obtain the proper division of the Mashonaland Railway Company’s receipts direct; for the Rhodesia Railways, Southern Rhodesia was credited with 95 per cent of the takings from the Salisbury-Kalomo section, and those from the Vryburg- Bulawayo section were divided on mileage. On the Beira-Salisbury section a mileage proportion was taken for the receipts due to the Salisbury-Portuguese Border length. The same methods were adopted for livestock and vehicles. In the case of the other sources of revenue, division by mileage has been taken where no closer allocation could be made.

It must be realised that in compiling a hypothetical statement of this character, a good many assumptions have to be made. Division of expenditure by mileage, though the only practical method of estimating in certain cases, is at best only an approximation. For example, on the Rhodesia Railways section from Salisbury-Kalomo, the northern portion from Livingstone to Kalomo is clearly cheaper to run than the portion from Salisbury to Livingstone, but it would be
impossible to gauge how much cheaper it is without a detailed examination of items, which is obviously out of the question. A mileage division was therefore adopted, and in this, as in all the other cases, the assumptions taken have never been unfavourable to Southern Rhodesia, and wherever there has been a doubt it has been given in its favour.

Two items call for comment; the first the deduction of £44,500 for bonus mileage given to the Portuguese portion of the Beira-Salisbury section by the Rhodesia Railways. This has been deducted, as it is assumed that the present agreements remain in force; also, if the Southern Rhodesian portion were cut off it would probably still find it advisable to pay this bonus mileage, for the reasons I have given earlier. The share of pier dues at Beira, now credited to the Beira-Salisbury section, has been included also, because the present working agreement allows for this. The sum included is the portion due to the Salisbury-Umtali section of the Mashonaland Railway Company, plus the proportion due for the short section of the Beira Railway, between Umtali and the Portuguese frontier. / Throughout, this small section, six miles, has been treated as being included in Southern Rhodesia, although it belongs to the Beira Railway Company. The share of port working, calculated in the same manner, is also included on the other side.

The result of this estimate is to show a surplus for the portion in Southern Rhodesia of £37,900. If no bonus mileage was given this would increase to £82,400.

It must not be assumed from this result that if the Southern Rhodesian portion were cut off from the remainder of the system it would support itself. The working expenditure is usually higher in proportion on a smaller system, and the overhead charges weigh more heavily. The portion in Southern Rhodesia, if cut off and maintained as a separate concern, would certainly not realise as large a surplus as is given above, and would probably not prove to be self-supporting.

The surplus of £37,900 for the Southern Rhodesian portion contrasts in rather marked fashion with the figure of £428,983, the combined net profits of the Rhodesia Railways and of the Mashonaland Railway Company for the same year. The comparison shows clearly that the best paying sections of both Railways are those which lie outside the borders of Southern Rhodesia; the advantage to this Colony of maintaining the financial connection is obvious.

I have the honour to be,

Sir,

Your most obedient, humble servant,

F. D. HAMMOND.

NATAL GOVERNMENT RAILWAYS.

REPORT

OF

J. H. SMITH

SPECIAL RAILWAY COMMISSIONER.

UPON THE

ADMINISTRATION, ORGANISATION AND WORKING

OF THE

NATAL GOVERNMENT RAILWAYS.

[...]
To the Hon. the Minister of Lands and Works,  
Colonial Office, Pietermaritzburg, Natal.

Sir,

In pursuance of the arrangement I entered into with the Agent-General on behalf of the Government of Natal, to visit the colony for the purpose of investigating the present administration, organisation, and working of the Railway Department, and to recommend what alteration, if any, it would in my opinion be desirable to make for the more efficient working of the service, I have the honour to state that I left England on the 18th of October, 1902, arrived at Cape Town on the 5th November, and after interviews with the principal Cape Railway officials, proceeded to Johannesburg, where I had the pleasure of meeting Sir Percy Girouard, the Commissioner of the Central South African Railways, arriving at Pietermaritzburg on the 12th November.

After a conference with the Prime Minister, I proceeded to Durban, and commenced my inspection and enquiries into the working of the Natal Railways.

Through the full and ample facilities which were afforded me by the direction of the government, and the ready and courteous assistance rendered by the management, I was enabled to travel over the entire system, to visit and inspect every Station and Goods Shed, the Engine Sheds and Workshops, the Stores and Maintenance Depots, the Pumping and Electric Light Stations, and the Indian and Native quarters. I had also interviews with the General Manager, the Assistant and Traffic Managers, the Chief Accountant, Engineer-in-Chief, Superintending Engineer of Construction, Maintenance Engineer, the late and the present Locomotive Superintendent, and the other officers in the various Departments. I also enquired into the working of the different offices with the staff attached thereto, as well as the Stores Superintendent’s Department. As far as time would permit, on various occasions I also took the opportunity of inspecting the condition of the stores and materials in stock.

During my visit I thought it desirable to obtain interviews with representatives of the traders of Durban, Pietermaritzburg and Ladysmith, and also with the Committee of the Natal Fruit Farmers’ Union.

On leaving Natal en route for England I again visited Johannesburg for the express purpose of enquiring into the working of the office established there by the Government to represent the interests of the Natal Railways.
ENGINEERING DEPARTMENT.

CONDITION OF LINES.

MAIN LINE.

As regards the Main Line, it is well ballasted with broken stone throughout, effectually drained and weeded, and for the greater part sufficiently fenced. The banks and cuttings together with the permanent way have been maintained in first class order, and the whole of the line having now been laid with a rail weighing 78 lbs. to the lineal yard, it is capable of carrying an almost unlimited traffic.

I discussed with the Engineer-in-Chief and the Maintenance Engineer the merits of the method of laying the rails with what is known as ‘broken’ joints, instead of ‘even’ joints, especially having regard to the breakage of the 45 lbs. rails on the Branch Lines.

The system of platelaying adopted by American Engineers, which is almost universal over their 200,000 miles of Railways, is that known as the ‘broken’ joint, and although engineers in different countries have divergent views as to the merits of the plan, it cannot be gainsaid that American engineers have an extensive experience, and that they are quick to grasp the value of any system which will improve the road. It has been successfully demonstrated in America that the derailment of engines and vehicles is far less than was formerly the case, and that the running of the trains is much smoother and more agreeable to passengers.*

BRANCH LINES.

North Coast Branch.

In regard to the branch lines, so far as the permanent way is concerned, they are not in the same satisfactory condition as the main line. They are for a considerable portion of their different lengths ballasted with sand and / laid with rails of 45 lbs. to the lineal yard. I have rarely travelled on any line with so much discomfort as on the North Coast Line. On making enquiries as to the cause, I was informed that the 45 lbs. rails had been in the road for over 20 years, but that it was intended to relay the first section with a heavier rail during the current year, and experience has proved that a fairly heavy rail with good stone or gravel ballast is the most economical in the end.

South Coast Branch.

The above remarks will equally apply to the South Coast Line, which, in my opinion, deserves far more attention than it has received up to the present. Its almost unique and unrivalled position, running as it does for nearly the whole of

* Col. Yorke, in his recent Report to the President of the Board of Trade upon his visit of America, confirms this.
its length along the sea coast, affording views of beautiful lagoons and rivers, and the most delightful bushland scenery, renders the line, from a passenger point of view, the most attractive branch in the Colony, both for holiday makers, health seekers, and for residential purposes. Several pleasure resorts have already been established, and the development of new places cannot fail to become popular, if only the line is brought up to the standard and a train service provided such as the district requires and deserves.

If it is urged that the extent of the present traffic will not warrant a better train service, I can only rejoin that without additional facilities the traffic is never likely to improve. It is the train service after all that develops a district and produces traffic, and although it is quite possible that at first some loss would be sustained, such a district, if fostered and afforded reasonable accommodation, would soon convert a non-paying into a profitable line. It would hardly be credited outside Natal, that it is now impossible for a passenger to travel by rail 77 miles from Durban and to return the same day.

**Richmond and Umzinto Branches.**
The Richmond and Umzinto Branches I found in good order, and I was glad to see that the ballasting of both these branches was being systematically undertaken, to bring them up to a higher standard of efficiency.

**Bluff Branch.**
The Bluff Line, when relaid with the heaviest rails and well ballasted (which will no doubt be an accomplished fact by the time this Report is presented, as the work was proceeding when I left), should develop into an important Branch with the heavy coal traffic which should be dealt with at the Bluff in the future. /

**Orange River Colony Branch.**
The running road was in good order, but the fencing which had been destroyed during the late military operations, and the repair of which was about to be proceeded with, should be completed as soon as possible, as the train in which I travelled was pulled up three times through cattle and horses being on the line.

**Dundee Branch.**
The Dundee Branch I found in good running order, but this line, as well as other branch lines where the 45 lb. or 46 lb. rails are at present laid, I would recommend should be relaid as soon as circumstances will permit, with a rail weighing not less than 60 lbs. to the yard.

**Formation of Main Line and Traffic Capability.**
The existing curves, as well as some of the grades, it appeared to me would admit of material improvement at a moderate cost, and whatever policy may be decided
upon as to the construction of new lines, the improvement of the present line should be kept steadily in view, and a reasonable amount set apart year by year to defray the cost. If the improvement of those places, where the heavy grades and sharp curves meet together, are systematically undertaken and additional crossing places are provided between Durban and Ladysmith, the carrying capacity of the line can be brought up to the practical working and haulage of upwards of 4,000 tons per day. By practical working I mean, apart from the running of the necessary trains, that a sufficient interval of time would be allowed for the effective maintenance of the line.

From diagrams which were prepared for my information, I found that at the present time a goods train service could be provided capable of dealing with 3,000 tons of Up traffic out of Durban per day, and when the new Crossing Place which is nearing completion between Botha’s Hill and Drummond is opened, and the further Crossing Place which is in contemplation, but not yet sanctioned, viz., between Hill Crest and Botha’s Hill is provided, 3,500 tons could be conveyed from Durban daily by 34 trains, or 1,085,000 tons a year of 310 working days.

I ascertained that at the time of my enquiry the traffic sent over the Main Line daily from Point and Durban amounted on the average to about 2,000 tons.

From a return of traffic conveyed for the year ending December 31st, 1902, I found that the gross tonnage dealt with between all stations, including live stock, amounted to 1,808,666 tons, or an average of 5,834 tons per day (excluding Sundays, Christmas, New Year’s day and Good Friday).

Goods Sheds.
At most of the goods sheds, I found that the flooring consisted of timber, and that rats had caused serious damage to the goods lying in the sheds. A concrete flooring should, in all future erections, be provided, and the existing timber floors replaced as early as possible.

Maintenance of Pumps.
At the present time all steam pumps used in connection with the watering arrangements are maintained by the Locomotive Department. They should be under the care of, and maintained by the Engineering Department. Any electrical pumps should be maintained by the Electrical Department.

Rail Creeping.
From a return I called for, I find that during the year 1902, there were 62 cases of ‘creeping’ of rails. On a number of railways an anti-creep chair has been adopted with the very best results, and as far as I have been able to ascertain, there has
been no case of creeping where they have been introduced. I would commend this matter to the attention of the Engineer-in-Chief.

**Station Waiting Rooms.**

At a number of stations the Waiting Rooms are badly designed. It surely cannot be necessary for four or five separate doors to be provided to obtain entrance to the Ladies’ Lavatories.

At some of the new stations the fittings supplied are of a much more expensive character than is necessary. Some of the fire-places, overmantels, furniture, and lamps are better suited to private mansions than Station Waiting Rooms.

**TRAFFIC DEPARTMENT.**

**Control of Stations.**

At a number of the stations visited I found a laxity prevailing which ought not to exist on any well-conducted railway. Some of the station masters and other employees were uncouth in their manner and ill-suited to come into direct contact with the travelling public. A want of discipline was apparent, and the disregard of the rules and regulations laid down for the guidance of the staff was very pronounced.

There were some notable and gratifying exceptions to this state of things, but these only tended to emphasise in my mind the conclusion at which I had no alternative but to arrive in other cases, and which I attribute to a want of close, continuous, and intelligent supervision.

At most of the stations the accounts were well kept, but otherwise disorder was a noticeable feature, and although no doubt at many of the stations the office accommodation is old and inconvenient, no reasonable excuse could be urged for the condition in which many of them were found.

I will instance some of the matters which came most forcibly before me:

**Fire Buckets.**

At some of the more recently-erected stations this important part of the equipment had not been furnished. At others although the buckets were there, they were empty, and in many cases had apparently been so for a considerable time.

**Instructions to the Staff.**

Although proper books are provided for the purpose, in comparatively few cases were the circulars issued from time to time by the different officers properly filed. I found them lying about in all directions, and apparently treated as so much waste paper, instead of being kept in order of date for ready reference.

Other books supplied for a specific purpose, such as the station equipment book, had in many instances not been entered up at all.
At stations, as a rule, where there was the least work to do, the greatest neglect was exhibited.

On calling for the Rule Book, which every servant of the Department ought to have readily available, it was frequently not forthcoming, and in many cases when produced was out of date. / 

I consider that the present system of issuing circulars for the guidance of the officers and staff should be altered. I cannot, for instance, see the utility or necessity for sending to Port Shepstone a circular relating to the working or alteration of the Glencoe Junction Yard.

Any notices which it is necessary to issue for specific purposes should be restricted solely to the places and persons affected.

I noticed that in a number of the circulars issued there was a clause warning the staff of the penalties that would be incurred by a disregard of the instructions.

I think this system of assuming that the staff will not obey the instructions is not that which is best calculated to obtain the strict and willing attention of the staff, and, in my opinion, it is better to assume that the staff will obey instructions and deal with any cases that arise when they are not carried out.

**Lamp Rooms.**

At many of the stations the Lamp Rooms were dirty and badly kept, and, as if to court disaster, accumulations of old books and forms were stacked therein.

**Links.**

There is a regulation that links must not be allowed to lie about the station yards, and that they are to be collected and placed on the stands provided for that purpose, or where there are no stands, that they must be deposited at a place specially set apart. At some stations this regulation was strictly observed, but at other stations the regulation was entirely disregarded, and I found links lying about in all directions. The instructions to Foremen Platelayers to collect any links lying about on their sections are also not carried out.

**Luggage Arrangements at Point.**

During my enquiry a number of complaints were made to me with regard to the difficulties experienced by passengers by the incoming steamers in obtaining possession of their luggage. The arrangements are anything but what they should be, and passengers landing and wishing to proceed on their journey by rail have good cause for complaint when in some cases several days elapse before they receive their luggage.

In three cases into which I personally enquired there was no valid excuse whatever for the detention, and if it is desired that the Port of Durban should not be prejudiced, a radical alteration should be effected in the existing arrangements.
Running of Trains.

From the returns which I had prepared for three months, it appears that out of the total number of Main Line trains, 76 per cent. ran to time; 10 ½ per cent. were from 1 to 5 minutes late; 4 ½ per cent. were 10 minutes late; 3 ½ per cent., 20 minutes; 2 per cent., 30 minutes, and 3 ½ per cent. over 30 minutes late. Of the Branch Line Trains 75 per cent. ran to time; 9 ½ per cent. were from 1 to 5 minutes late; 6 per cent., 10 minutes late; 5 per cent., 20 minutes late; 2 per cent., 30 minutes late, and 2 ½ per cent. over 30 minutes late.

Of the through Up trains to the Transvaal for the same period, 60 ½ per cent. were handed over at the Border to time, 8 ½ per cent. from 1 to 5 minutes late; 7 per cent., 10 minutes; 9 per cent., 20 minutes; 6 per cent., 30 minutes, and 9 per cent. over 30 minutes late.

On the Down journey the trains handed over to this Administration were as under:–

37 ½ per cent. to time; 3 per cent. from 1 to 5 minutes late; 13 ½ per cent., 10 minutes late; 18 per cent., 20 minutes late; 9 per cent., 30 minutes late, and 19 per cent. over 30 minutes late.

During the month of January, the evening Mail from Johannesburg was handed over at the border, 70 minutes late as a daily average. This irregular and bad working reacted on the Natal Service most prejudicially.

Although it is difficult to secure the same amount of punctuality in working over a single line, as with a double line, there is room for considerable improvement.

Signalling.

On the Natal Railways the signalling arrangements are of the most primitive character, and if the Railways were under the control of such an authority as the Board of Trade of Great Britain, I have little doubt that notice would be given to the effect, that in the interests of the public, the safety appliances now required and almost universally adopted, must be provided within a given time, or the working of the railways must cease.

‘Safety and not Speed’ may be a most excellent maxim, but I fail to see why in Natal time should be considered of less value than in any other part of the world.

The watchwords of every railway manager should be ‘expedition,’ ‘efficiency’ and ‘economy,’ and I cannot too strongly impress upon the Government the necessity for giving this matter the earliest consideration with a view not only of increasing the speed of the passenger trains, but of ensuring a greater degree of security than is the case at the present time. Such signals as are at present in use are a delusion, and afford very little protection either to the passengers or the engine drivers. In some cases I am able to say from personal observation, they have been disregarded altogether, and in others that divergent views prevailed between the day and the night staff as to the way in which they should be
treated. With a Main Line properly signalled and points interlocked on the most up-to-date methods, the adoption of automatic exchanges and suitable engines, the mail trains could be expedited between Durban and Charlestown by at least two hours and a half – a matter of no small importance to the travelling public.

Staff Working.
The system which has been adopted and is known as the ‘Electric Train Staff System’ is admirably adapted to the safe working of the Natal railways. Although where human agency has to be reckoned with, it cannot be described as absolutely infallible or as rendering accidents impossible, it is as near perfection as any system that has been introduced.

Stationery.
At few stations, at Home or abroad, have I observed anything worse than the system, or, rather, want of system, in dealing with the stationery. Many of the books and forms I found were stored under counters, in drawers, and on shelves, in the most untidy manner, and without any regard to economical consumption. Requisitions for many of the forms were sent in at the regular periods, although there were already supplies on hand, in some instances sufficient to last for several years. At one station there were some thousands of wagon labels of which 100 only, on the average, were used per month, and this state of things obtained more or less at most of the stations. At few places was the average consumption filled in in the column provided for the purpose, and in very few instances had the Stores Department failed to execute the requisitions exactly as they were made out by the station masters. At some of the stations forms and books had been supplied which were never used, and had apparently been there for several years. No check or control would appear to have been exercised in any quarter.

Tarpsaulins.
While the rule in regard to the care and treatment of tarpaulins is perfectly clear and well-defined, throughout the whole system the instructions appear to be ‘more honoured in the breach than in the observance.’ The general practice was not to fold the sheets carefully and in the prescribed manner as soon as the trucks are unloaded, but for them to be thrown upon the ground and exposed to the weather and rough usage. I was not surprised to find that two fully-loaded trains had been detained for over twelve hours because there were no tarpaulins available to cover the wagons, owing to the want of care and delay in returning them; no supply of sheets however ample would be sufficient to meet the requirements under such conditions.

As bearing upon the foregoing, and as exemplifying my remarks in another place upon the cost of renewing wagon covers, ropes and chains, I may point
out that for the year ending December 31st, 1902, the amount expended under this head was nearly £20,000, whereas on one of the English Railways with a mileage 50 per cent. in excess of the Natal Railways, and a revenue greater by 40 per cent., the cost incurred was under £13,000 per annum. No doubt a portion of the expenditure is due to the state of affairs arising out of the late war, but a large proportion of the amount is undoubtedly due to the destruction of the tarpaulins caused by the careless way in which they are dealt with at the stations.

Uncollected Tickets.

From a return which was called for, I found very serious laxity prevailed in the collection of tickets. On other British and Colonial Railways, if the number of tickets uncollected during any single month amounts to over two per cent., it is known that something is wrong, and, from the monthly returns which are prepared, a careful watch is kept upon the collection.

Upon the Natal Railways, however, it has not been the practice to keep any such return, but, from the figures above referred to, I find that no less than 16·42 per cent. of the tickets issued were never collected. This indicates either great carelessness on the part of the staff responsible for the collecting, or irregularities which ought not to occur. The subject will well repay continuous and systematic enquiry.

Weighing Machines.

At few of the stations was the rule in regard to weighing machines being attended to as a matter of daily routine, carried out. In numerous instances the steel-yards were rusty, and the excuse made in some cases was that it was the business of the Weighbridge Inspector to see to their cleanliness and proper condition. At most of the Goods Sheds the condition of the weighing machines was even worse than on the stations.

Observations and recommendations.

Accumulation of Old Books, Accounts, Correspondence, &c.

At the earliest opportunity I would recommend that a complete clearance throughout the whole system be made of all accumulations going further back than two years.

There can be no good reason for keeping waybills, invoices, or correspondence relating to matters of the time only, for a longer period than that mentioned, encumbering the stations with a mass of absolutely useless documents.

Booking of Seats.

I noticed on several occasions that passengers at Durban who had omitted to book their seats, not being aware of the necessity for so doing, were not allowed to proceed by the mail train, although there were a number of seats vacant in the
carriages. The explanation I received was that these seats were reserved for passengers from Pietermaritzburg, whether they were or were not required. / In accordance with the universal practice passengers from the longest distance are entitled to the preference, and they should be allowed to travel to any station where a train is timed to stop. I question very much the legality of any regulation to the contrary.

**Claims.**

For the year ending the 31st December last no fewer than 6,945 claim were lodged, the main proportion of which were for loss of and damage to goods, while the total amount paid and remaining to be paid amounted to about £17,000.

A very unsatisfactory feature is the growing number of claims, and the amount paid for compensation is very large compared with other Colonial and English Railways. I received strong complaints from the traders as to the inordinate number of losses through pilferage and breakages caused by careless handling, and these complaints were justified, judging by the claims paid.

I saw the Superintendent of the Railway Police, and he assigned as one reason for there being so many claims for goods lost, the errors made by the checkers, and the consequent wrong loading of goods.

If an improvement is not speedily effected, it may become necessary to consider the desirability of establishing a special Railway Police Staff.

The Goods Superintendent at the Point has introduced a very good system of recording the number of errors made by each checker, and there is no doubt that the knowledge that this record is being kept will tend to greater care on their part.

**Convict Traffic.**

I find that on the average upwards of 300 convicts are conveyed daily from Durban to Point and back.

No payment is made for this service to the Railway Department, which should not be expected to perform work gratuitously for other departments. The amount involved is about £1,500 per annum.

**Durban Station.**

The whole of the arrangements and accommodation for dealing with the coloured traffic are very inadequate, and the sooner they are improved the better. / I constantly saw carcases of frozen meat lying on the ground outside the latrines, and the necessity for an alteration is very pressing.

I think it would be advantageous if more European porters were employed on the platforms. Passengers arriving by steamer, and desirous of proceeding by train, are hampered through being unable to make the natives and coolies under-
stand where they wish to go and how they wish their small articles of luggage disposed of.

Complaints were made to me also that when the trains from the Transvaal are very late, passengers often experienced great difficulty in getting their luggage dealt with, owing to the want of sufficient porters.

**Durban Forwarding Parcels Office.**

This is very inconveniently situated, having regard to the distance parcels for despatch by train have to be conveyed between the office and the train. I understand, however, that the existing arrangements are only temporary, and awaiting the adoption of a scheme for improving generally this part of the station.

**Durban and Maritzburg Goods Sheds.**

At neither of these stations are the goods sheds arranged so as to permit of the expeditious and economical handling of traffic.

Whenever the inevitable alterations are carried out, it is to be hoped that the greatest care will be exercised in their design, and that the most modern and best labour-saving appliances will be supplied. I saw on one occasions when at Maritzburg fourteen men engaged in unloading from one of the 33-ton high-sided wagons, a case weighing about 10 cwt., which occupied them fully a quarter of an hour. With a proper crane it could have been transferred from truck to trolley in less than two minutes, and three men at the outside would have been engaged in the work.

**Electric Lighting of Trains.**

I find that experiments have been made and are still in progress with a view of effecting an improvement in the lighting of the passenger trains. The fittings for the system of electric lighting known as ‘Stone’s’ were ordered for 44 carriages of various descriptions. In this case, bearing in mind the largeness of the order, a decision would appear to have been arrived at before it had been sufficiently demonstrated that the system was suited to the particular character of the Natal Railways, and that it would meet all requirements. Upwards of £6,000 has been expended in fitting a number of vehicles to test a system of lighting which there is little doubt will prove ineffectual and unsuitable for the Natal Railways, at any rate with the apparatus which has, up to the present, been provided.

It appears to me that before so large an expenditure was incurred a single coach equipped with the ‘Stone’s’ system would have been amply sufficient to demonstrate its suitability or otherwise, and the experiment should have been carried out at the sole cost of the patentees. It is evident that however satisfactory the system may be on other railways where a high rate of speed can be obtained, it is not, as at present supplied, suited to a railway where, on account of the heavy grades, the speed is necessarily limited.
In regard to what is known as the ‘Accumulator’ system, that appears to answer all requirements. The initial cost is far less than ‘Stone’s,’ the maintenance is much cheaper, while the light afforded is, on the whole, infinitely better.

The cost of fitting up a train consisting of five vehicles with ‘Stone’s’ patent apparatus is about £680, while the cost of fitting four coaches and a van on the ‘Accumulator’ system is about £180.

The ‘Accumulator’ system has also the advantage of adding to the dead weight of the train less than one-half the weight of the ‘Stone’s’ apparatus.

‘Exceptional’ Arrangements.
There are, I consider, far too many ‘exceptional’ arrangements in force on the Natal Railways, both in the Coaching and Goods Departments.

In the former, when once the regulations, which should be carefully revised, have been adopted, they should be adhered to in their entirety.

The same remarks also apply to the goods rates and arrangements. It is not only confusing to the public, but also to the staff, for arrangements involving a departure from the established tariff to be continually introduced.

Fines.
The fines inflicted upon the staff at the present time are credited to working expenses. This is wrong in principle, and the amount should form the nucleus of a fund for the relief of the relatives of employés injured in the execution of their duties.

The head of each Department should be empowered to deal in whatever way he may find to be necessary with the employés in his own Department, but any dissatisfied servant should have the right of appeal to the Commissioner of Railways.

Fruit Traffic.
In regard to representations made by the Committee of the Natal Fruit Farmers Union, I could not but recognise the reasonableness of their application that suitable trucks should be provided for the conveyance of the various fruits, and that greater care should be exercised in the loading and unloading thereof.

When iron trucks are used and covered with tarpaulins, fermentation soon takes place, causing serious loss to the grovers. At the stations from which fruit is mostly sent, it is also desirable that covered accommodation should be provided so that it may be loaded without detriment in all conditions of weather.

The Committee also suggested that it would be desirable for a small charge to be made for the empties returned, and were pleased to hear that I had already arrived at the same conclusion, and decided to make such a recommendation in my Report to the Government.
**Goods Rates and Classification.**

With comparatively few exceptions the goods rates in Natal have been framed so that the same rate per ton per mile for the carriage of merchandise obtains for the last mile as for the first, whereas throughout England, France, and other countries in Europe, Australia, and America, the principle adopted is a 'decreasing rate' per ton per mile for an 'increasing distance.'

As an example how this operates, I may point out that for goods classed as Normal, and conveyed from the Point to Johannesburg, the rate is £7. 13s. 4d. per ton of 2,000 lbs., or 3·78d. per mile for the throughout distance.

On the English railways the following scale may be taken as a fair sample of the basis upon which the rates are calculated for the carriage of goods in the corresponding class:

<table>
<thead>
<tr>
<th>Distance</th>
<th>Rate per ton per mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 20 miles</td>
<td>4·30d.</td>
</tr>
<tr>
<td>For the next 30 miles</td>
<td>3·90</td>
</tr>
<tr>
<td>” 50 ”</td>
<td>3·80</td>
</tr>
<tr>
<td>Beyond 100 miles</td>
<td>2·90</td>
</tr>
</tbody>
</table>

On the French railways, for similar goods the initial rate for the first 50 miles is 2 1/2d. per ton per mile, and is gradually graded down so that when the distance the goods are carried exceeds 625 miles, it is no higher than 1 1/4d. per ton per mile.

On other Continental railway systems the rates are based upon the following scale:

<table>
<thead>
<tr>
<th>Distance</th>
<th>Rate per ton per mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 46 miles</td>
<td>1·56d.</td>
</tr>
<tr>
<td>From 47 to 93 miles</td>
<td>1·25</td>
</tr>
<tr>
<td>” 94 ” 124 ”</td>
<td>.94</td>
</tr>
<tr>
<td>” 125 ” 217 ” and over</td>
<td>.62</td>
</tr>
</tbody>
</table>

In America, as is well known, for long distances merchandise is carried at rates which gives an almost infinitesimal sum per ton spread over the entire mileage, but at the same time yield a fair profit.

In Australia the following will serve to show the basis upon which the rates for the carriage of goods in the highest class are calculated:

<table>
<thead>
<tr>
<th>Distance</th>
<th>Rate per ton per mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>For the first 100 miles</td>
<td>5·25d.</td>
</tr>
<tr>
<td>” second ”</td>
<td>4·20</td>
</tr>
<tr>
<td>” third ”</td>
<td>3·675</td>
</tr>
<tr>
<td>” fourth ”</td>
<td>3·15</td>
</tr>
<tr>
<td>From 401 to 500 miles</td>
<td>2·625</td>
</tr>
</tbody>
</table>

On some of the European State-owned railways the rates have been fixed not so much with the object of obtaining the best financial return upon the outlay involved in the construction of the lines, but to develop the resources and trade of the countries.
Throughout the whole of the South African Colonial Railways I would strongly recommend, if it has not already been brought about, that there should be adopted one uniform classification of goods, in accordance with the practice in Great Britain, America, on most of the European railways and in the Australian Colonies, and the antiquated system at present in operation of classifying goods as ‘Normal,’ ‘Intermediate’ and ‘Rough’ abolished.

There are many reasons which could be adduced why such an alteration should be brought into force as early as possible. / Inter-Colonial Relations.

I have referred to this important question of through rates in detail, because the present practice is so entirely opposed to that prevailing elsewhere. There is no single instance of which I am aware in Great Britain where, in the case of through traffic conveyed at agreed rates, the receipts are not divided according to mileage, and there would appear to be no sound reason why the same system should not be adopted in the case of Natal and the Transvaal.

When the Netherlands Company was in existence, masters of the situation dominating the position, and able to dictate their own terms, the position was different, but now that British Colonies alone are concerned, more equitable arrangements should be adopted.

That the cost of living is so great is largely due to the abnormally high rates charged for the conveyance of the necessaries of life, and until a different state of things is brought about, the prosperity and development of the Colonies must be seriously retarded.

I understand that a Conference is to be held for the purpose of considering these and other railway matters, and it is to be hoped that a broad-minded view of the whole position will be taken, to the advantage of all the Colonies concerned, and that the ultimate federation of the railways of South Africa will be borne in mind. But until this is an accomplished fact, I would commend to the notice of the Government the desirability of initiating steps with a view to the pooling of the receipts from the through traffic to the Transvaal.

It cannot be desired that one Colony should profit to the detriment of another Colony, but that all should work in harmony and with the utmost goodwill to each other.

If such an arrangement could be brought about there should be no difficulty in settling the terms, allocating the receipts, and fixing the allowance for working expenses by whichever route the traffic is carried. A body of competent railway men would find no difficulty in adjusting the terms on a basis satisfactory to the different Colonies concerned.

I may instance in support of this statement, that 40 years ago an agreement was entered into between three of the most important railways in England for
a division of the receipts from traffic for which they were all competitors. This agreement is still in operation and has worked with the most beneficial results to all parties.

Mails.
The amount received by the Department from the Post Office for the conveyance of Mail matter, is the same to-day as it was in the year 1892, viz., £7. 10s. per mile.

For the year ending 31st December, 1892, the amount paid to the Department was £2,897, for the year ending 31st December, 1902, £4,505. The postal revenue during the same period increased from £49,433 to £110,277, so that the Railway Department is not receiving an adequate return for the service rendered.

The payment ought not to be less than £12 a mile at the present time, having regard to the increase in the work performed by the Railways for the Postal Department, and seeing that the Railway Department pays no less a sum than £4,500 per annum to the Postal (Telegraph) Department for the maintenance of the wires and appliances used in the working of the Railways.

Maritzburg Ladies’ Waiting Room.
I consider the employment of a Night Attendant for the Ladies’ Waiting Room at Maritzburg is unnecessary.

One is not provided at Durban nor at the Waiting Rooms on the principal stations in England after 8.0 p.m.

Occupation of Ground by Military.
When at Harrismith I saw a large area of ground stacked with Military stores. I presume that some arrangement will be come to with the Military authorities to pay a rental if the occupation is intended to be a lengthy one.

Parcels over 50 lbs. in Weight.
The temporary restrictions in regard to parcels over 50 lbs. in weight not being accepted for conveyance by passenger train, should be put an end to as soon as possible.

If traders are willing to pay for the conveyance by passenger train of ordinary parcels at parcels rates, there should be no limitation whatever to the weight they may desire to send. It simply means throwing away the revenue to be derived from a good paying traffic.
Passenger Fares.
The passenger fares, especially for the long distances, are abnormally high. Three pence per mile first class and two pence per mile second class for the entire distance, are rates that are now but rarely charged in any country.

I would recommend a revision, and that a new set of fares, based on the scale shown below, should be introduced.

<table>
<thead>
<tr>
<th>Miles</th>
<th>1st Class</th>
<th>2nd Class</th>
<th>3rd Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 100</td>
<td>3d</td>
<td>2d</td>
<td>1d</td>
</tr>
<tr>
<td>101 ” 110</td>
<td>2·95</td>
<td>1·95</td>
<td>1</td>
</tr>
<tr>
<td>111 ” 120</td>
<td>2·90</td>
<td>1·90</td>
<td>1</td>
</tr>
<tr>
<td>121 ” 130</td>
<td>2·85</td>
<td>1·80</td>
<td>1</td>
</tr>
<tr>
<td>131 ” 140</td>
<td>2·80</td>
<td>1·80</td>
<td>1</td>
</tr>
<tr>
<td>141 ” 150</td>
<td>2·75</td>
<td>1·75</td>
<td>1</td>
</tr>
<tr>
<td>151 ” 160</td>
<td>2·70</td>
<td>1·725</td>
<td>1</td>
</tr>
<tr>
<td>161 ” 170</td>
<td>2·65</td>
<td>1·70</td>
<td>1</td>
</tr>
<tr>
<td>171 ” 180</td>
<td>2·60</td>
<td>1·675</td>
<td>1</td>
</tr>
<tr>
<td>181 ” 190</td>
<td>2·55</td>
<td>1·650</td>
<td>1</td>
</tr>
<tr>
<td>191 ” 200</td>
<td>2·50</td>
<td>1·625</td>
<td>1</td>
</tr>
</tbody>
</table>

Return fares to be a single fare and a half.

Passengers’ Luggage.
The practice which at present prevails of luggage being left by passengers on the platform on arrival at Durban for the Department to look after, should be discontinued. All passengers should be required to claim their luggage on arrival of the train, and if they desire to deposit it in the Cloak Room they should do so under the existing regulations. At the present time the Department takes custody of the luggage, and stores it for the passengers for varying periods.

Although a charge is made for this service, it is a bad practice, and the contract with the passenger having been completed upon his arrival, any / further services required of the Department should be the subject of a new contract.
Passes.
The percentage of passes uncollected was not less than 44 per cent. of the total number issued. This is even still more indicative of the laxity which exists on the part of the collecting staff. It would tend to lesson the number of uncollected passes if separate passes were issued for both the outward and return journeys, instead of one pass covering both journeys, as at present.

It would also appear, from the circulars issued in regard to lost ‘periodical’ passes, that there is great carelessness on the part of the persons to whom they are issued, and only under the most exceptional circumstances should passes be re-issued to those who lose them. I am well aware of the difficulties in carrying out such a regulation in its entirety, but if once it were known that there would be great difficulty in obtaining a re-issue, it would ensure more care on the part of the holders.

The number of uncollected ‘periodical’ passes was as under:–

<table>
<thead>
<tr>
<th>Pass Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual ‘All stations’ passes</td>
<td>18·6%</td>
</tr>
<tr>
<td>‘Sectional’ passes</td>
<td>24·3%</td>
</tr>
<tr>
<td>Short period passes</td>
<td>15·4%</td>
</tr>
</tbody>
</table>

A very unsatisfactory state of affairs.

The number of periodical free passes issued is very large, and the list should be most carefully scrutinised and revised.

The number of open passes issued – *i.e.*, passes not bearing the name of any particular person – is far too great, and only under the most special circumstances should they be issued. Such passes are readily transferred, and, during my enquiries, I ascertained that it was by no means a rare occurrence for this to be done. There can be very little security for the Department so long as such passes are in existence. Contractors and others carrying out Departmental works should be required to pay not only their own fares, but those of their workmen. It has been stated that if this were required the cost of the works would be increased, but even if that were so – although I do not admit it would be the case – a bad system would be abolished.

I think it is also desirable that a rule should be laid down that no employé in receipt of less than £250 per annum should be entitled to a first-class pass.

I would further recommend that the head of each department should be empowered to issue single or return journey passes to the employés in his own department, all sectional and periodical passes being issued from the office of the Commissioner.

I find that there are no regulations in force as to the issue of free passes over the Natal Railways, nor have any instructions been issued to the Staff, giving the names of the Officers authorised to sign and issue passes.

The Regulations should stipulate:–
1. The names of the Officers having authority to issue passes.
2. The circumstances under which passes may be given, viz., for business, leave, or special reasons.
3. That monthly returns of all single journey passes issued must be sent to the Accountant, so that he may take steps to see that all such passes have been properly dealt with and collected.
4. That the Officers authorised to issue sectional and periodical passes will, in the same way, be held responsible for the collection of such passes, upon expiry, from the persons to whom they have been issued.

It is the general practice for a circular to be issued at the end of every year advising the Stationmasters, Ticket Collectors, and all concerned as to the description of passes which will be in force for the ensuing year, and, giving the names of the officers authorised to issue and sign them.

The Officers and Employees of the Department who have obtained leave of absence for their annual holiday, and to whom passes are now issued might, I think, have the privilege extended to their wives. I have always found that a little liberality in such cases is much appreciated by the staff, and tends to the creation and maintenance of good feeling.

Pietermaritzburg Passenger Station.
No more inconvenient station so far as the office accommodation is concerned, could have been designed. All the offices and rooms required in connection with the passenger traffic are dark and dismal, requiring artificial light throughout the daytime.

The structural arrangements are certainly not conducive to the health and well being of the staff, while the inconvenience of carrying on the business of the station in such ill-ventilated and ill-lighted rooms can hardly be realised. / 

Private Sidings.
I consider that the conditions upon which any new sidings required for the accommodation of private parties are provided, should be altered, and that the cost of the work upon the land of the Department as well as upon the owner’s land, should be borne entirely by the applicants.

Public and Working Time Tables.
I had intended recommending that a suitable time table for the information of the public should be issued, but I am glad to find that the question has been receiving attention, and the first presentable book of its kind has recently been published and issued. The time table appears to meet the requirements, but its value would be enhanced by the addition of a good map on a comprehensive scale similar to that attached to this Report. I felt very greatly the want of a good and modern map of Natal during the course of my enquiry.
In the small editions descriptive matter of general interest might well be added, and the publication could be improved upon and made much more artistic and attractive than at present.

Arrangements should be made with the Steamship companies trading regularly to and from Durban for a supply of the public time tables as well as the small editions to be placed in charge of the Purser, who, when the vessels left the respective ports outward-bound, should place them upon the tables in the saloons for the information of the passengers.

I found it impossible to obtain any information whatever in regard to the train service in Natal on the steamer by which I travelled.

I consider that the Working Time Tables might also be simplified. At present the highest train number shown in the working book is 536, but the number of trains provided for is about 390, the difference being accounted for by lapsed numbers. Taking however the trains actually run on a given day, the number was only 265 including both Ordinary and Specials. In my opinion too, the letters a.m. and p.m. are preferable to the vertical line now used to show the distinction in the trains running between 12 noon and 12 midnight.

Refreshment Rooms.
These are well-conducted. The food and drinkables supplied are good, the charges are moderate and the attendance satisfactory, while the Contractor and his managers exercise close supervision and attention to details. I found in no single quarter any dissatisfaction, but, on the contrary, approval of the efforts made by the Contractor to provide for the requirements of the travelling public.

When, however, the present tenancy expires and fresh tenders are called for, I would suggest that in addition to the rent that may be offered, the conditions of tender should stipulate for a percentage payment upon the gross receipts, so that the Railway department may participate during the currency of the tenancy in any development and improvement of the traffic that may be brought about through the growing prosperity of the Colony.

This suggestion also applies to the Contracts for the Bookstalls, Advertisements, and Automatic Machines.

With a view also of maintaining the principle that as little traffic as possible should, under any circumstances, be conveyed free of charge, I recommend that, on the expiration of the present Contract, a quarter of the ordinary goods or parcels rate should be charged for the carriage of all provisions sent from or to any Refreshment Room on the Natal Government Railways, Advertisements, and for all articles sold at the Bookstalls, or required for replenishing the Automatic Machines. Unsold articles, books and show cards to be returned to Durban free of charge.
Returned Empties.

I would recommend that a small charge be made for the conveyance of returned empties.

During my Inspection, I found quantities of empties at various stations that had been carried by the Department considerable distances, which the consignees did not think it worth their while to remove.

It was in fact suggested at an interview I had with one of the Trading Associations that such a charge should be made in order to ensure greater care on the part of the servants of the Department in dealing with the empty packages.

Season and Traders’ Tickets.

The basis upon which the Season Ticket rates are framed should be revised.

I do not think it advisable that Season Tickets should be issued for any less period than one month, and that the issue of other Season Tickets should be restricted to quarterly, half-yearly and yearly.

The rates for quarterly and six-monthly tickets are altogether disproportionate to the yearly rate. The monthly rate should be one-twelfth that of the yearly rate, plus 20 per cent; the quarterly rate should be one-fourth that of the yearly rate, plus 15 per cent; and the six-monthly rate half the yearly rate, plus 10 per cent.

The practice of refunding the value of the unexpired period of the tickets should be abolished, and only in the case of the death of the holder, or some very exceptional circumstance, should any portion of the amount paid be refunded.

It would I consider be desirable that season tickets should be issued on a reasonable scale over a minimum distance to traders paying not less than £500 per annum, also to bona fide Insurance Agents and Commercial Travellers.

South African Produce.

Although from my experience I have found that it has been the wish of the respective Governments of the Colonies with which I am acquainted to develop the local industries, either by high protective duties or concessions in the freight rates, it has come to be recognised that such concessions should not be made at the expense of the community at large. In respect to one industry alone, and dealing only with a single case, I find that under existing arrangements there is an absolute loss upon the traffic dealt with, amounting to close upon £1,800 per annum.

In addition to this, the necessity for the abolition of certain of the Colonial produce rates was urged upon me by some of the traders’ representatives, as it was pointed out that in a number of articles described as products of the Colony, the principal ingredients were actually manufactured elsewhere and imported.

The whole of the arrangements in regard to this traffic require the most careful revision, and such regulations laid down as will guard against losses and prevent undue advantage being taken of any concessions made by the Government.
In another case I found a truck occupied practically for a whole day in conveying 15 tons of stone, for which the Department received the sum of half-a-crown.

**Sunday Trains.**

While not an advocate for the employment of unnecessary Sunday labour, I consider that facilities should be afforded to the public who cannot avail themselves on week-days of visiting such well-known sea-side places as Isipingo, Amanzimtoti, Illovo and Umkomaas on the South Coast, and as far as Pinetown on the Main Line, trains being arranged at such suitable hours as would doubtless attract a considerable traffic. Cheap Return fares should be issued at 3/– 1st class, and 2/– second.

The experiment might also be extended to Wests and Return tickets issued at 1/6 1st class, and 1/– second.

**Uniforms and Clothing.**

I think the uniforms and caps supplied to the staff might be very much improved upon, and brought more up to date.

The travelling public attach a great deal of importance to the smart appearance of the staff, as giving a tone to the system generally. Employés to whom it is decided that clothing is to be supplied should be designated, and the articles of uniform specified.

**Locomotive Department.**

**Accidents and Derailments.**

During the year ended 31st December, 1902, there were 161 casualties, of which 26 were fatal. There was no accident attended with loss of life to any passenger, but the number of derailments to engines, wagons, and carriages, and the number of collisions, amounted to no fewer than 986. Out of this number, engines left the rails on 521 different occasions, of which 380 were of the ‘Reid’ class. There were also 411 derailments of wagons, so that it is evident, either that the road was not properly maintained and was out of order, or the engines and wagons were unsuited to the road.

I could find no evidence to warrant the former presumption, so that there is no alternative but to assume the latter.

**Carriage Examination.**

I do not consider the examination of carriages as at present conducted is sufficient, or that it is carried out as it should be.
I travelled from time to time in carriages in which there were a number of defects which ought to have been detected and remedied before the carriage was put into traffic working.

Carriage Sheds.
Throughout the whole of the system there is practically no provision for the protection of the carriage stock, which, having to remain in the open, is exposed to all the varying climatic conditions, rendering the cost of maintenance far heavier than it would be if proper carriage sheds were provided at different points for the protection of the stock.

Carriages.
The carriages now running on the Natal Government Railways are well adapted for the traffic, and would appear to be generally appreciated. The windows and louvres, however, are provided with antiquated and most dangerous fittings. They are expensive, ineffectual for the purpose required, difficult to manipulate, and their use is attended with personal risk. I tried on several occasions to raise or lower both the windows and louvres without success, while it would be almost impossible for ladies to move some of them at all. Appliances of a very simple and effective character are now in use, and have been generally adopted, and the present fittings should be dispensed with at the earliest opportunity.

During my travels I heard the most uncomplimentary remarks made about these appliances, and they certainly deserve all the condemnation which in my hearing they so frequently received.

I find the new carriages that have been delivered, notwithstanding that they are fitted with the electric light apparatus, have also a cumbrous Provision made for their lighting with oil lamps. This is a reflection upon the electric lighting Department, which, from the experience of the past, is not warranted. In no new railway carriage in England will any such duplication of fittings be found.

Cleaning of Waste and Sponge Cloths.
It would pay the Department to provide appliances for dealing with the oily waste and sponge cloths. The residue could be adapted for the various machines in the works, while the cleaned waste could be utilised for engine cleaning and other purposes. /

The consumption of waste is very considerable, and the article so expensive that the adoption of the suggested appliances would be attended with an appreciable saving.
Durban Locomotive Yard.
I think it is a matter for regret that on so invaluable a site for traffic requirements as is occupied by the different shops in connection with the Locomotive Department, new buildings for the latter department should be in course of erection.

Sooner or later the greater portion of the ground upon which the buildings stand will be required to accommodate the passenger traffic, which it is to be hoped that the growing prosperity of the Colony will develop. The present method of dealing with the out-going and in-coming trains can only be regarded as a makeshift.

The accommodation for the Locomotive Department is cramped and confined. The yard is practically open to every person who chooses to enter it, and with materials lying about in all directions a premium would appear to be placed upon dishonesty. However limited and insufficient the accommodation may be, I cannot admit that there is any excuse for the present condition of the Locomotive Yard. A thorough overhauling is required and the scrap heap which would be established if the yard were properly cleared would be of no small dimensions. I have never seen such disorder prevail in any Locomotive yard.

The irregular disposition of the shops necessitates the employment of a larger number of foremen than would be necessary if they had been erected in a modern and systematic manner on a suitable site with a due regard to future extension.

Emission of Smoke at Stations.
On many occasions I noticed that the rule in regard to Engine drivers arranging their fires so as to avoid any unnecessary emission of smoke from their Engines while standing at or passing stations, was disregarded, to the evident annoyance of passengers and the injury of the station buildings.

Engines, Carriages and Wagons Under or Waiting Repairs
In January, out of 225 engines all told, 48 were under or waiting repair, or 21 per cent. This is higher than it should be, the normal rate being from 14 to 15 per cent. / The percentage of the carriage stock under repair or waiting repairs was 12.57, and of the wagon stock 4.76. Both are above the average, which in coaching stock should not exceed 5 per cent. and in wagon stock 3 ½ per cent. I am glad to find that the Locomotive Superintendent fully appreciates the necessity for getting all vehicles out of the shops and into traffic as quickly as possible.

Engine Sheds, Turntables, Pumping Stations.
Some of the engine sheds and turntables are not kept as clean and the pits washed out as they ought to be. The same remark also applies to the pumping stations.
The only explanation I could obtain was that the coolies neglected their duties, but the Inspectors should see that the men employed for specific work attend to it.

Footboards on Carriages.
The carriage footboards on a large proportion of the stock are dangerous as at present constructed, and such carriages would not be allowed to run in England. The steps are continuous, but they would not prevent passengers falling between the platform and the carriages. The platforms throughout should be of uniform height and so built as to admit of the carriage steps clearing them when constructed the recognised and regulation width.

Hose not Properly Secured.
At a number of the stations I noticed that after the engines had taken water no attempt was made to leave the hose properly secured in accordance with the rules.

Johnston’s Buffer.
I find that since 1895 the rolling stock has been almost entirely fitted with Johnston’s Patent Buffers. The number fitted and on order amounts to 2,786 at the time of writing.

The cost of this buffer is £8. 17s. 9d., while the ordinary buffer used on the old stock costs from £3. 16s. 0d. to £4. 2s. 10d. / It is extremely doubtful if the advantages claimed for the Johnston’s buffer warranted its adoption at such a price, and although it cannot be denied that it does possess certain merits, yet I found the working staff did not regard it with entire satisfaction, and a train by which I travelled was detained five minutes before a connection could be made between the engine and carriage.

The buffer was submitted to some of the railway authorities in Australia, and its advantages were not considered commensurate with its cost. I have heard quite recently that the price of the buffers made locally did not exceed 35s. each, and this in a Colony where the prevailing rate of wages is as high as in Natal.

‘Reid’ Engines.
As regards the order which was given for the construction of 99 additional engines of the ‘Reid’ type, I cannot but express the opinion that far too precipitate action was taken in the adoption, after only a few weeks’ trial, of an entirely new class of locomotive, which had taken seven years to design and produce. However pressing the necessities brought about by the disorganization caused through the late war, I consider that at least a twelve months’ effective and continuous trial should have been given, to demonstrate whether the engine possessed all the merits and advantages claimed for it, and the late Locomotive
Engineer, writing, before the experimental engine had even been ordered, stated that it would require at least a six months’ trial before any satisfactory decision could be arrived at.

Neither its adaptability to the road, its effect upon the permanent way, its own wear and tear and cost of repairs, its consumption of coal and stores, could possibly have been determined after only a few weeks’ trial.

While the type of engine may eventually be found to answer the purpose for which it was specially designed – viz., for the haulage of heavier loads at a moderate speed – it is nevertheless a fact that, at the present time, there is no engine suitable for the hauling of the new Corridor trains, one of which has arrived and the other shortly expected.

**Rolling Stock and Engines.**

I recommend that the stock-taking of January 4th, 1903, should be taken as the stock to be maintained and kept intact for the future, and that all renewals or replacements necessary to maintain the stock in accordance with the returns then obtained should be a charge against working expenses. / I would also recommend that, from the same date forward, there should be replaced 2 per cent. of the engine stock per annum, and that the cost of these renewals should be charged against working expenses.

The time has now arrived when it will be necessary to commence the rebuilding and replacement of some of the older engines, and in adopting 2 per cent. as the extent of the replacements, it will be found that this is the general practice pursued by the principal Railway Administrations.

**System of Paying Employees.**

I noticed when in Pietermaritzburg, that under the present system of paying the employees, very considerable time was occupied, and while the labourers were receiving their pay, the machines and mechanics in charge of them were idle.

Some better system should be introduced, so as to avoid the loss of time and waste of power.

**Testing of Crane Chains and Slings.**

I find there are no regulations in force as to the systematic and periodical testing of the crane chains and slings.

Rules should be laid down providing for every chain and sling being sent once a year to the Locomotive Department to be tested.

**Testing Eyesight.**

It appears that there have been in force no regulations for the periodical examination or tests of the eyesight of the enginemen and firemen.
With so imperfect a system of signalling as that which now exists it has not been considered of importance, but with the introduction of proper and up-to-date signals this matter should receive the attention of the Locomotive Superintendent.

**Wagons.**

Before adopting the present 33-ton eight-wheeled high-sided wagon as the standard, I think further enquiry should have been made, and more experience obtained with a view of satisfactorily testing its suitability or otherwise for the traffic required to be carried. I have heard many complaints respecting this description of wagon, and have noticed at various times and places with what difficulties some of the wagons have been loaded and unloaded; one thing is quite certain, that they are far heavier than is necessary, the dead weight hauled being equivalent to 50 per cent. of the carrying capacity. The aim of all Railway Administrations of late years has been to get the lightest vehicle possible, compatible with strength, and on a number of railways, wagons are now running with a carrying capacity of 50 tons, while the dead weight of the wagon is only slightly in excess of 15 tons.

It will be interesting to note that the total carrying capacity of the wagons in use on the Natal Government Railways, assuming them to be fully loaded, which in actual working is impracticable, was at the time of my enquiry 65,606 tons, while the dead weight of the vehicles equalled 36,357 tons, or 55 per cent.

By the adoption of pressed steel underframes, great strength, combined with lightness, is obtained, and when it is not only possible but quite feasible to increase the ratio of paying freight from 45 per cent. to upwards of 75 per cent. the importance of the subject, especially on a system like the Natal Railways cannot be overestimated.*

For the six months ended December 31st, 1902, the total quantity of merchandise conveyed to and from the Transvaal and Orange River Colonies amounted to 212,588 tons. On this basis the total yearly traffic may be assumed at 425,000 tons. With suitable stock as described above, 127,500 tons additional could have been hauled at the same cost.

The cost of the iron wagon is also very high, being not less than £535 per wagon, with freight, insurance and erection charges included.

The maintenance charge during a given time has yet to be ascertained, but it will, I am afraid, be very heavy judging from the number of cases of hot boxes I noticed. The returns for November and December showed that there had been no fewer than 131, while for all classes of vehicles the number was 189.

* See also Col. Yorke’s Report of recent date on this subject.
WORKING EXPENSES.
The working expenses in the Locomotive Department for the year 1902 are out of all reason, and it will devolve upon the Locomotive Superintendent to see that they are reduced to fair proportions.

The cost of running per train mile, compared with 1897, is more than double, while the total expenditure per train mile has increased by no less than 1s. 1.27d.

It is necessary for the most vigilant supervision to be exercised, with a view of bringing the expenses in this Department to a normal condition.

STORES DEPARTMENT.
It is much to be regretted that the arrangements for housing the general stores and other materials are of such a hybrid description. Within such a limited area it is impossible that the different buildings and sheds can be so concentrated and arranged as to permit of effective supervision, and the business of unloading stores and loading up for distribution is attended with difficulty and inconvenience.

While some of the present buildings are well adapted, if there were suitable land available, or it could be secured, the whole Department should be remodelled and additional buildings erected to provide for the more effective reception, custody, and distribution of the stores than is possible at present.

The Stores Department is invariably regarded in all railway systems as the commercial arm of the service, and it is above all things desirable that the officer in charge should be well acquainted with the condition of markets, and keep a close watch on the course of events as being likely to influence prices of the many articles in daily use on every railway. It is also desirable that practical men should be associated with him to assist in the selection, and valuation of the stores purchased.

So far as regards local contracts, the terms of contract should always stipulate that the names of the makers of the different articles are to be furnished in the tenders, so as to render it impossible for articles of an inferior character to be foisted upon the Department.

DISTRICT STOREKEEPERS.
The District Stores at Greyville, Maritzburg, Ladysmith, and Charlestown when established, should be placed in charge of District Storemen, under the supervision and control of the Superintendent of Stores.

A much more effectual check over the consumption would be possible under this arrangement than is the case at present.
Home Indents.

When specifications and drawings are forwarded to the Agent-General they should be of the most complete character, as otherwise considerable difficulty is experienced in concluding contracts and effecting satisfactory purchases at so great a distance from the source of information.

Stationery.

As regards the requisitions for stationery from all Departments, these should be passed through the respective Chief Offices, so that a more effectual control may be obtained.

The lax conditions which I found to prevail at a number of Stations mainly accounts for an increase of no less than 45 per cent. in the cost of stationery supplied during last year, as compared with that of the previous year.

The increase in the traffic for the same period being only 24 per cent., tends to show the necessity for more direct supervision.

Supply of Stores to Stations.

As regards the supply of stores to stations, I think it would lead to greater economy if the general stores were supplied quarterly instead of monthly, and as there is practically no check at the present time upon the requisitions, they should, so far as the Coaching Department is concerned, be transmitted through the office of the Superintendent of the line, and when sanctioned, passed on to the Storekeeper for execution.

In the same way requisitions from the Goods depôts should be passed through the Goods Manager’s Office, and similarly dealt with. The same regulation should also prevail in regard to the Engineering, Locomotive, and other Departments.

Tarpaulins.

I do not consider that the system of dealing with the wagon tarpaulins is correct. The last sheet manufactured was numbered 6224, from which it would reasonably be assumed that that was the number of / sheets available for traffic purposes excepting those under repair or waiting renewal. Such, however, is not the case. I find that the numbering of the sheets commenced originally from 101, then between 4250 and 5001 there was a break, and no sheets bearing those numbers, I was informed were manufactured. The reason for this I was unable to ascertain, as the arrangement was made some years ago, and there are no official records.

It appears also that when a sheet is condemned it is not the practice to replace it with one bearing the same number, but to defer in some cases for as long a period as two years the issue of a new sheet bearing the number of that condemned. For this practice I could obtain no satisfactory explanation.
The tarpaulins actually available for traffic at the end of January numbered 3,594, and those waiting repairs, under repair, or waiting issue, 1,140. With the lapsed numbers of 750 and 100 this would leave a deficiency, according to the stock books, of 640 sheets.

The stock-taking which was appointed for the 4th January last, may disclose the whereabouts of these missing sheets, but the returns not being complete when I left Natal I was unable to pursue the matter further, but as each sheet costs about £10, every means should be adopted to trace them, and to get both the stock and the books in accord.

In future whenever a new wagon is handed over to the Traffic Department a new sheet should be issued with it as a part of its equipment, and the number to be maintained, and the cost charged against working expenses, should be that shewn by the stock-taking of January 4th last, any deficiency also being made good and replaced at the same cost.

**Value of Stocks on Hand.**
The stocks on hand at the end of 1902, were valued at £164,409, which cannot in any way be regarded as excessive, and from the enquiries I made, I found that this amount represented not only the book, but very closely approximated to the actual, value.

The value of the timber in stock was under £10,000, and of the rails, about £8,000. There were on order, rails to the value of £24,000. / It is desirable that advantage should be taken of favourable markets, to augment the stocks of both timber and rails.

**Working Charges.**
In order to cover the working charges of the Stores Department, amounting to about £21,000 per annum, it was formerly the custom to charge a percentage upon the whole value of the Stores passed through the books, so that each of the Departments contributed towards the cost.

For the year ending 31st December, 1902, the value of the stores and materials issued was £1,180,054. In this amount was included the cost of Engines, Rolling Stock, and Permanent Way material. To cover the entire expenses therefore, it would have been necessary to charge about 1 ¼ % upon the value.

The practice now is, however, for the whole of the salaries and incidental expenses to be placed upon the Estimates and voted by Parliament, whilst as regards the wages staff and other expenses, it is still the practice to charge a percentage upon the value of the stores issued to the consuming Departments.

It is not desirable that this diversity of practice should be continued, and the whole of the expenses should either be included in the estimates and voted by Parliament, or each Department should be debited with a percentage on the
value of the Stores supplied to cover all expenses. The latter course is that now adopted by some of the important Railways.

A great deal of detail work is transacted in the Stores Superintendent’s Office, necessitating the employment of a considerable staff. This detail is of little value. A curtailment of it so far as the bookkeeping is concerned, and an entire reorganisation should enable the Department to be worked more economically, and with a less clerical staff, than it is at present. The total European staff numbers 110, consisting of – 1 superintendent, 43 clerks, 22 storemen, 2 storekeepers, 2 foremen, 12 checkers, and 28 sailmakers.

As an example of the foregoing I may remark that the system in operation generally throughout the Departments, of sending in separate requisitions for materials for works required to be carried out at the same place, involves an unnecessary amount of book-keeping which might be well avoided, and the staff of clerks engaged on this account could be more profitably employed in other directions. /

**GENERAL.**

**Branch Line Accounts.**

The cost incurred in keeping separate the statistics of the Branch Lines, is upwards of £1,800 per annum. I fail to see that there is any good reason why this system should be continued, because the lines having been constructed, they should now be treated as part of the whole system, and the useless expenditure mentioned above avoided.

If at any time a special return is required, it can readily be prepared.

**Capital and Revenue.**

While the tendency of many railway administrations hitherto has been to charge much of the expenditure that ought to be debited to working expenses to capital account, for the purpose of producing more immediate satisfactory financial results, I cannot, as a matter of strict railway finance, concur in the course that has been adopted by the Natal Railway Department.

In the year ending December 31st, 1901, no less a sum than £159,328 was charged to the working expenses of the year, the greater part of which should properly have been charged to capital.

The effect of this has been to show that the net revenue was so much less than was actually the case and the working expenses abnormally increased. I take it that the true policy of any Colonial Administration is not to make large profits out of their railways, but to lessen the cost of transport and communication, and thereby assist in developing to the utmost the resources of the Colony and to cheapen the cost of living.
A very good and sound practice now generally adopted is to charge to working expenses the cost of all new buildings or erections not exceeding £300. Any considerable expenditure that may have to be incurred in re-laying existing lines with heavier rails should be spread over several years, and not wholly debited to the working expenses of the year in which the work is carried out.

Two thousand new tarpaulins are in course of delivery at the present time, the cost of which will be about £20,000. This amount it is, I understand, also proposed to charge against working expenses.

Concession Tickets.
The system of issuing concession or privilege tickets to nearly every employé in the Public Service, and to many other persons, requires the most careful revision, and in many instances I think the practice should be abolished altogether.

For the year 1902, the difference in the amount paid to the Department and what it would have received if ordinary fares had been paid was upwards of £3,000.

Filling Vacancies.
I do not like the idea of a circular being issued intimating that there are certain vacancies for station masters, and inviting applications for the posts.

As I have already pointed out, the capabilities of the employés considered eligible for promotion should be known, and a selection made accordingly.

Harbour Facilities.
There can be no question as to the disadvantages experienced at the present time by the Railway Department in dealing with traffic at the Point, on account of the want of facilities and appliances.

Now that the re-laying of the Bluff Line with the heaviest rail is nearly, if not wholly completed, it is to be hoped that with the reclamation of a much greater and a sufficient area to allow of the provision of ample siding accommodation, and the equipment on that side of the best appliances for the coaling of vessels, that the Harbour Authorities will issue such orders as will make it compulsory for all vessels to do their coaling on the Bluff Side instead of at the Point.

I took the opportunity of obtaining the views of several commanders of large trading steamers, and from what they informed me, I have every reason to believe such an alteration would not only be warmly welcomed, but much appreciated. It would also considerably relieve the already congested sidings on the Point Side, enable the ships to load up or discharge with far greater promptitude, and prevent the serious inconvenience, if not liability to damage, which is now experienced when merchandise is being loaded or discharged during coaling operations.
Hours of Duty.
It is desirable that the hours of duty in all the Administrative Offices should be the same throughout all Departments, viz., 9 a.m. to 5 p.m. (with an interval of an hour at mid-day for luncheon), and from 9 to 12 on Saturdays.

Indian and Native Quarters.
At the Native and Indian quarters throughout the line, I would recommend that it should be the duty of the Officer having the supervision of the Indians and Natives, to frequently visit and examine these quarters.

Whatever the customs and habits of the coloured races may be, so long as they are in the occupation of quarters erected and maintained at the expense of the Government, order and cleanliness should be insisted upon, and the quarters should be lime-washed more frequently than at present. The premises I found in some cases to be in a very dirty and disreputable condition, not altogether due to neglect on the part of the occupants.

Insurances.
Although on account of the rates of insurance being so high, the Government decided to accept the risks generally, there is still and amount of between £1,300 and £1,400 paid annually for the insurance of certain buildings and materials. This amount I consider can very well be saved, because the State is a much larger Corporation than an Insurance Company, and can afford to be its own Insurer.

Johannesburg Office.
I spent a day enquiring into the working of this office. The representative of the Natal Railway Department is well qualified for the important position he holds.

He is closely in touch with the traders and importers, and from what I gathered in conversation with some of the agents, he gives every attention to their business, and endeavours by all means in his power to secure traffic through the Port of Durban and over the Natal railways. / It was a wise step on the part of the Government in establishing this Office, and with the development of trade and industries in the Transvaal, it will become of still more importance.

London Office.
I am of opinion that it would be well worth the consideration of the Government to establish in London a commercial office on similar lines. With a representative having a knowledge of the merchants, traders and exporters, both at home and on the continent, able to quote rates, supply information, and canvass for traffic, great benefit to Natal could not fail to result.
NEW LINES.
I recommend that the estimates submitted to Parliament for the construction of any new lines in the future, should in all cases include the cost of providing such additional rolling stock and engine power as it is estimated will be required for the service of the particular line.

OFFICERS’ MEETINGS.
Once a quarter, on days to be fixed at the beginning of every year by the Goods Manager, Superintendent of the Line, Locomotive Superintendent and Engineer-in-Chief, a meeting of the respective divisional Superintendents should be held with a view to any questions that have arisen affecting the working of the line being brought forward. After the various matters have been fully discussed, minutes should be drawn and the officers’ recommendations forwarded to the respective Heads of Departments for submission to, and approval or alteration by the Commissioner.

OVERTIME.
For the year ending 31st December, 1902, the following was the overtime paid in the several Departments:–

<table>
<thead>
<tr>
<th>Department</th>
<th>Overtime Paid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance Department</td>
<td>£9,000</td>
</tr>
<tr>
<td>Locomotive Department (Works Branch)</td>
<td>£39,000</td>
</tr>
<tr>
<td>Locomotive Department (Running Branch)</td>
<td>£43,000</td>
</tr>
</tbody>
</table>

In the Traffic Department, I was unable to obtain the amount paid, as no separate return is kept, although it is very desirable that this should be done. From the examples given, it is apparent that the amount paid for overtime is far in excess of what it should be, and the working of the staff unduly long hours points either to the necessity for their duties being re-arranged and more evenly distributed, or the employment of additional men.

PIECE-WORK.
Having regard to the character of the labour upon which the Department has so largely to depend, I would be very glad to see, if it could be possibly arranged, a system of paying the men engaged in the loading and un-loading of traffic, a rate per ton instead of a daily wage. I think if it were made perfectly clear how much could be earned by the more expeditious handling of goods, the native would soon appreciate the alteration and infuse a greater amount of energy into his work to the mutual advantage of the Department and himself.
Point Arrangements.
I could not help being struck by the great advantages which would be derived in dealing with the traffic, and in other ways, if the whole area were enclosed similar to the docks in London and elsewhere, and only those persons having business allowed to pass the gates. At present there is but little protection against robbery, and the numerous cases which have been brought before me indicate that it is at the Point where the losses are sustained.

Printing Department.
The operations of this branch of the service should be extended as soon as it is possible to secure a site for the erection of suitable buildings near the General Stores, of which it should form a part.

The results obtained since the Department commenced the execution of part of its own printing, both as regards despatch and economy, have been so satisfactory as to leave no room for doubt, that the earliest extension of the printing works, so as to admit of the whole of the work being done, would be attended with an appreciable saving and convenience to the Department./

Railway and Parliamentary Accounts.
At present the railway accounts are made up to the 31st December in each year, while the Parliamentary accounts and estimates are made up to the 30th June.

It would be found much more convenient if arrangements could be made so that the accounts and estimates were co-terminous.

In New South Wales, Victoria, South Australia and Queensland the railway accounts and the Treasury accounts and estimates are all made up to the 30th of June in each year.

Railway Law No. 9.
Having regard to the fact that this Law has to be renewed yearly, it occurred to me that under its provisions the powers delegated by His Excellency the Governor to the General Manager to fix rates and fares and make bye-laws, &c., might also require renewal, and the Attorney General, whose opinion I solicited, was good enough to advise as follows:-

‘This Delegation is limited to alteration of rates at present fixed, i.e., when the delegation was granted, and does not allow of an increase in said rates.

‘The Delegation is that of a defunct council before Responsible Government was granted. It is incautious to give a standing Delegation.

‘A fresh Delegation should be obtained and renewed from time to time; any important revision should be submitted to executive Council, i.e., Governor in Council and Delegation should so provide.’

This matter will no doubt receive the consideration of the Government.
Recruiting the Staff.
I would recommend that periodical examinations of youths desirous of entering the railway service should be held, say twice a year, or even quarterly, if found necessary. /

The examination should not only be educational, but also physical, so that none but those well qualified, by intelligence and in good health, should be admitted.

If public notice were given by advertisement in the newspapers of the intended examinations – which should be conducted by a certificated teacher coupled with a railway official – I have little doubt there would be a ready response, and that the department would eventually be rewarded by having a well-educated, well-trained, and generally efficient staff.

Sick Leave.
I find it has not been customary to keep returns of the amount paid to the Staff in respect of sick leave. It is very desirable that a record should, in the future, be kept, forming, as it does, one of the privileges of the staff employed by the Railway Department, not usually accorded to persons in the service of private employers.

Smoking.
Throughout the system generally I came across numerous instances in which the rule in regard to the servants of the Department not smoking while on duty was disregarded. So long as there is a rule in regard to that or any other matter, it should be strictly enforced.

Speed of Trains.
The reason for the construction of Railways is that passengers and merchandise may be transferred as speedily as possible from one place to another, and although Permanent Way Engineers are universally anxious to limit the speed of trains as much as possible because of the effect it has in increasing the cost of Maintenance, still that should be the last and not the primary consideration.

It is absolutely necessary for the efficient and speedy working of traffic that the road should always be in such a condition as to be available for any description or weight of engine and Rolling stock that may require to run upon it; the class of engines and rolling stock should certainly not be limited or restricted in any way by the road. /

Superannuation Fund.
It should be made a condition that all persons joining the service after a date to be fixed, if eligible, should become members of the above fund.
The present conditions attached to membership, however, need revision so as to render the fund more attractive, and so that the contributors may receive benefits more commensurate with their payments than are provided by the existing conditions.

The fund should be managed by a Committee composed of a representative from each Department in the service. At the first meeting of the elected representatives, a Sub-Committee should be appointed to revise and report to the full Committee the alterations and new conditions attached to membership which are found necessary.

As an instance of the unpopularity of the fund, as at present constituted, I find that out of a total possible membership in the Railway Department of 4,730, there are now only 615 members.

**Statistics.**

I annex hereto (Appendix A) a comparative table of railway statistics relating to four of the Australian Colonies, New Zealand, Cape Colony and Natal, which I think may prove of interest. The information now furnished is somewhat fuller than when I first issued similar statistics in Australia.

**Traffic and Staff Returns.**

I think it would be found desirable if the weekly statements of traffic sent in by the stations had the necessary provision made so that an explanation could be given on each statement of the reason for any increase or decrease in the traffic or revenue.

The information so given would be found valuable for reference from time to time, and would admit of the information being given in the Annual Report, which latter should also, in addition to the information already afforded, contain a statement giving the yearly traffic received at, and forwarded from, every station on the line, and also a detailed list of the staff employed in all Departments of the Service similar to that prepared at my request, and a copy of which accompanies this Report. – Appendix B.

**INTERVIEWS WITH TRADERS.**

From the interviews which took place between myself and the representatives of the merchants and traders, I gathered that while up to the present time there had been every disposition to make allowances for the want of facilities granted previous to the War, it was the general opinion that matters by this time should have assumed their normal position, and that the traders should not be subjected to the disabilities they were experiencing.

In some instances, also, the want of additional appliances was pointed out.
Complaints were also made to me as to the delay the traders frequently experienced in the settlement of their just and *bonâ fide* claims.

In some cases very strong complaints were made as to the favouritism which it was alleged had been shown in the allotment of tonnage; that goods conveyed at the undamageable rate were not treated with the same care and consideration as those which were charged at the higher rates, and that loss and damage frequently occurred in consequence.

It was further pointed out that where the loading and unloading of trucks with goods charged at rates which included loading and unloading, collection and delivery, when any of these services were performed by the consignor or consignees, no allowance was made.

I called for the papers in these cases and made enquiries in regard to the various points which had been submitted, and ascertained that where additional facilities and accommodation had been asked for, enquiries had been made and, in some instances, the necessary expenditure for the provision of the accommodation authorised.

Owing to the great pressure of traffic which followed close upon the termination of the military operations, there can be no doubt whatever that the merchants experienced the most harassing delays in getting their goods despatched, and I am by no means satisfied that the best arrangements, even under the then existing circumstances, were made to forward the traffic and prevent complaints on the part of the traders.

It was stated not once, but on several occasions, that by the payment of *douceurs* to the subordinates, it was possible to obtain a preference in the despatch of traffic. I was unable to trace any single case of the kind, but I found that as much expedition was not used on all occasions as was possible.

When it is also ascertained upon enquiry that traffic has been delayed through the neglect of some employé of the Department, I think it would be far better that the fact should be frankly acknowledged.

As regards the loading and unloading of traffic by the consignor or consignee or his agents, or the collection and delivery is effected in the same manner, I am of opinion it would be only fair that an allowance of 9d. per ton should be made for the loading or unloading of any goods charged at carted rates, and when the collection or delivery is performed by the consignor or consignee or his agents, that an allowance of 1s. 6d. per ton should be made.
RECOMMENDATIONS FOR THE FUTURE ADMINISTRATION, ORGANISATION AND WORKING OF THE NATAL GOVERNMENT RAILWAYS,

I recommend that the Chief Executive Officer of the Department be known and designated as ‘Commissioner of Railways.’

I have taken into consideration all the surrounding circumstances, and am of opinion that the title will more accurately represent the official position, and that it will commend itself to Parliament, the Public, and the Staff.

While the appointment should be absolutely non-political, the Commissioner would be answerable for the proper and efficient working of the railways to the Minister responsible to Parliament for the Department.

For the success of such an undertaking as the Natal Railways, which is the largest earning, and, at the same time, the largest spending Department of the State, what is required is a Chief and an Administrator unfettered and unhampered by work and details of a routine character, but an officer who can apply his time and energies to the improvement of the service in every direction and the development of the traffic.

With judicious decentralization, and the appointment of well-trained and experienced officers in the Traffic, Engineering, Locomotive and Stores Departments, endowed with ample authority, combined, at the same time, with full responsibility, and the system equipped with the most modern and the best appliances for the saving of labour (which I regard as so essential in a Colony subject, like that of Natal, to a variety of disturbing influences), the service should be so conducted as to give satisfaction to the public, and yield, at the same time, a fair return upon the capital invested in the railways. The successful management of any railway undertaking is not wholly confined within the limits of safe working and the earning of large dividends, but embraces – especially in the Colonies – other important considerations of a commercial, social and political character. /

Secretary for Railways.

This officer would be the means of communication between the Commissioner and all departments of the Service. He must be a fully qualified railway man, as his duties would of necessity bring him into close contact with the public, and upon him would devolve duties of so varied a character that only a man of high attainments would be fitted for the position.

Amongst the secretarial duties he should also keep the history of every salaried officer and clerk from the time of his entering the Service up to date, so that it may be known at once what his qualifications and career are when he may be recommended for promotion.
Appointment of Goods Manager.
In the actual working of the Railways, having regard to the increasing goods traffic, the revenue from which is now considerably in excess of £1,000,000 per annum, I consider that it is essential that an officer should be appointed to act as Goods Manager, and to take full control of everything pertaining to the Goods Department, including rates, claims, and complaints, the Goods Agents and Staff, where such are found to be necessary throughout the system. He should also have control of all cartage arrangements for the collection and delivery of goods traffic.

This officer to be directly responsible to the Commissioner of Railways. An Inspector should be attached to the office of the Goods Manager.

Superintendent of the Line.
For the control of the Passenger Department, an officer whose designation should be ‘Superintendent of the Line’ should be appointed. This officer should arrange for the running of all trains, both passenger and goods, and in his department would be included all excursion arrangements, parcels arrangements, passenger and parcel rates and fares, claims, refunds, complaints, signalling, train working arrangements throughout the Line, the control of station masters, passengers, and parcel agents, and station staff of all grades. / He would also be responsible for the preparation and issue of all time tables, sheets, pamphlets and notices, both to the public and the staff.

This officer would be directly responsible to the Commissioner of Railways. An Inspector to be attached to the Office of the Superintendent of the Line.

Divisional Superintendents.
The system should be divided into four sections and supervised by the following officers at each of the four most convenient centres:–

Four Divisional Traffic Superintendents.
Four Divisional Engineers.
Four Divisional Locomotive Superintendents.

The maps marked B and D indicate my proposition for the re-division of the Traffic and Engineering Districts.

The Locomotive Divisional Superintendents should be stationed in accordance with my recommendation on page 50.

Traffic Department.
The Officers in charge of the divisions indicated on Map B should receive the designation of ‘Divisional Superintendents,’ and be responsible for the proper conduct of both passengers and goods business in their respective Divisions, and report to either the Superintendent of the Line or the Goods Manager upon the questions arising in each Department respectively.
These officers should be held responsible for the working of that traffic throughout their respective Divisions, and control and supervise all indoor and outdoor arrangements at the stations as well as the staff employed thereat.

They should be responsible for the regulation of the daily train service the issue of such notices as may from time to time be found necessary, the examination of the Guards’ journals of trains running locally in and through their own divisions.

The Divisional Superintendents should be required to frequently visit and examine all the stations and offices in their respective divisions.

With a view also of preventing delay, and to meet the views of the trading community, each Divisional Superintendent should have authority to deal with and settle claims for loss of or damage to goods or parcels arising in his Division to the amount of £10.

To each Divisional Superintendent’s Office should be attached an Inspector whose duty it should be to visit the stations and report as to the order and condition in which they are kept, and the business conducted; the working of all vehicles, and generally as to the manner in which the duties of the staff are carried out.

I further recommend the appointment of an officer with the designation of ‘District Goods Manager’ to take control of the traffic at the Point, Durban and the Bluff.

**Engineering Department.**

For the better supervision and more economical maintenance of the line, I would recommend that the system be divided into districts as shown on Map ‘D.’ The Divisional Engineers should reside at the stations which would be found most central and convenient within the respective divisions. These officers should be capable of carrying out all new works authorised, the construction of sidings, the erection of buildings, and such appliances as may require to be provided from time to time.

Clerks of Works, where necessary, together with the Permanent Way Inspectors, should be attached to the office of the Divisional Engineer, and act under his directions.

**Locomotive and Carriage and Wagon Department.**

These Departments will be under the control and supervision of the Locomotive Superintendent.

Having regard to the growing importance of the Locomotive Works, and the number of men now employed, there should be appointed a Works / Manager, who would be responsible to the Locomotive Superintendent, and in like manner, a thoroughly qualified and practical man should be appointed to take the
position of Carriage and Wagon Superintendent, responsible in the same way to the Locomotive Superintendent.

For the control of the Running Sheds and Engine-working over the various sections, Divisional Locomotive Superintendents should be placed at Durban or Greyville, Pietermaritzburg, Ladysmith and Charlestown.

To each of these offices should be attached a Travelling Inspector who should report to his Divisional Superintendent.

There should also be a Chief Inspector attached to and forming part of the office of the Locomotive Superintendent.

**Electrical Department.**

Having regard to the important and growing developments of electricity, both for lighting and power, I am of opinion that this Department should form a separate and independent part of the system, and be placed solely under the charge of the present Electrical Engineer, who would be directly responsible to the Commissioner.

If the Railway system is to be worked with the greatest possible efficiency combined with economy, the electrical appliances will have to be largely augmented, not only in the Traffic Department but also in the Locomotive and other shops, and also applied to the watering arrangements throughout the Line, wherever it is found that electricity can be utilized with a saving on any other system.

**Labour Department.**

This is a department of increasing importance. The procuration and supply of labour so vitally affects the well being of the railways in all branches, and the responsibilities of the officer in charge are of such a character as to warrant his being designated ‘Superintendent of Labour Department,’ directly responsible to the Commissioner of Railways.

To meet the difficulty attending the supply of labour, it would appear to be necessary to adopt one of three courses:—

1. Legislation by the Government, having for its object the increase of taxation upon the Native races, rendering it imperative upon them to labour more continuously in order to obtain the necessary funds to meet this taxation.

2. The introduction of Indian labour under such arrangements, conditions and restrictions as may be found necessary.

3. The importation of white labour. Looking at the fact that at the present time there are thousands of men in London and other large cities seeking employment; men – such as dock labourers who surround the Dock gates daily waiting for work – well qualified for manual labour, and little or nothing else, if accredited agents went amongst these men, and made it known that employ-
ment could be obtained in Natal, that they would be housed on arrival, have all their food supplied, and at the end of the week or the month each man would receive so much cash in addition, I cannot but think that a very considerable number of men would be induced to try their fortunes in Natal, considering their present precarious circumstances. Such an arrangement would necessarily involve the passages of the men being paid, as well as the finding of the necessary accommodation and provisions, as suggested above, on their arrival.

**Railway Organisation and Lines of Responsibility.**
The following diagram will illustrate my proposals for the administration and organisation of the Railways:

**Skeleton Diagram Showing the Proposed Railway Organisation and the Lines of Responsibility.**

**Salaries.**
Above all things it is desirable that the Staff should be so fairly remunerated that a spirit of contentment should prevail, instead of discontent, and having regard to the high cost of living in the Colony, that the scale of salaries should be placed upon such a basis as will induce the salaried and professional members to remain and devote their best energies to the Service.

The Government has already recognised the claims of the uniform staff and the workmen in the different Departments by fixing a rate of wages to be paid in each case. The scale was certainly not illiberal, and as far as I have been able to ascertain, it has given satisfaction to the men engaged in the Railway Department.

The professional and salaried members of the Staff, however, still remain to be dealt with, and in framing the scale of remuneration submitted herewith, I trust it will commend itself to the Government as being fair and equitable. Hitherto this branch of the service has been neglected, and because no radical or combined action has been taken, as in other cases, that is no reason why the claims of that portion of the staff should be any longer disregarded. In their case no matter what stress or strain there may be, they do not receive overtime for the extra hours entailed by the work upon which they may be engaged, which in many instances is almost continuous. No such cases arise with this section of the Staff as I have found in the Locomotive Department where a driver received for the overtime he worked nearly fifty per cent. of his wages in addition. His ordinary wages amounted to £234. 11s. 8d. per annum, and his overtime to £112. 10s. 6d. In the case of a guard also, the result was even more striking. His ordinary wages for a month amounted to £15. 10s. 6d. and overtime and expenses to £13. 18s. 6d. or £29. 9s. 0d. in all.

It is only under the most exceptional circumstances that this state of things could or should be possible, and whatever may have been the difficulties in the
past in getting suitable men, there should be no difficulty in obtaining the services of well trained and qualified men at the present rates of remuneration.

**SCALE OF SALARIES.**

**Commissioner of Railways.**
The remuneration to be paid to this officer I would suggest be left in the hands of the Government, as there are so many special circumstances attached to the appointment as to render it impossible for any specific amount to be decided upon, although I do not think that any Railway man qualified by special training and experience for so responsible a position could be secured at a lower salary than £2,500 per annum, even if at that.

**Secretary.**
The Secretary to the Commissioner should receive £750 per annum, rising by £50 a year to a maximum of £1,000.

**Goods Manager.**
The official holding this position should receive £900 per annum, rising by £75 a year to a maximum of £1,200.

**Superintendent of the Line.**
The Superintendent of the Line should also receive £900 per annum, rising by £75 a year to £1,200.

**Divisional Traffic Superintendents.**
These officers should receive £550 per annum, with yearly increments of £25 to £700.

**District Traffic Superintendent, Johannesburg.**
This officer should receive £550 per annum, with yearly increments of £25, to £700, the present special allowances, amounting to £450, to be continued.

**District Goods Manager.**
The District Goods Manager, having the control of the traffic from and to the Point, Durban, and the Bluff, should also receive £550 per annum, rising by £25 a year to £700.

**Inspectors.**
The inspectors attached to the offices of the Goods Manager and the Superintendent of the Line should receive £350 per annum, with yearly increments of £20, to £450.

The District Inspectors should receive £225 per annum, with yearly increments of £15, to £300.
Stations.
The whole of the Stations should be divided into four classes, according to the character and importance of the work transacted at each place.

The salaries attaching to –

First Class Stations to range from £450, with yearly increases of £25, to £500.
Second Class Stations to range from £300, with yearly increases of £20, to £400.
Third Class Stations to range from £225, with yearly increases of £15 to £300.
Fourth Class Stations to range from £180, with yearly increases of £10 to £220.

Goods Agencies.
The Goods Agents at Durban, Point and Maritzburg to receive £400 per annum, with yearly increases of £25 to £500.

The Goods Agents at Ladysmith and Newcastle to receive £300 per annum, with yearly increases of £25 to £400.

Note. – When the above scales are brought into operation, all allowances which have hitherto been made, such as free quarters, stores, fuel and oil for lighting, to be abolished. A rental in future to be charged sufficient to cover interest on outlay and maintenance for the houses and quarters provided; all fuel and lighting also to be charged for. This practice has now been adopted with most satisfactory results on a number of English and Australian Railways.

In fixing the salaries under this new scale, the minimum to be paid should be the present salary, with the ten per cent. bonus and a sum equivalent to the payment to be made for house and quarters accommodation, stores, fuel and lighting, or allowance in lieu thereof, not exceeding the maximum of the proper class of the station.

Engineering Department.
The Engineer-in-Chief, I recommend, should receive a salary of £1,200 per annum, rising by £100 per annum to £1,500.

The Superintendent Engineer of Construction should receive a salary of £900 per annum, rising by £75 per annum to £1,200.

The Maintenance Engineer should receive a salary of £700 per annum, rising by £50 per annum to £1,000.

The four Divisional Engineers whose appointment I recommend should receive £550 per annum, with yearly increments of £25 up to a maximum of £700. /

The Chief Draughtsman, Construction and Maintenance Accountants should each receive £500 per annum, rising by £25 per annum to £650.
Senior Draughtsmen and Senior Surveyors to receive £350 per annum, rising by £25 per annum to £500.
Assistant Draughtsmen and Assistant Surveyors to receive £250 per annum, rising by £20 per annum to £350.
Junior Draughtsmen and Junior Surveyors to receive £150 per annum, rising by £15 per annum to £225.
Such Clerks of Works as it may be found necessary to appoint to those positions should receive £350 per annum, rising by £20 per annum to £450.
Permanent Way Inspectors on appointment to receive £275 per annum, rising by yearly increments of £15 to £350.

Locomotive Department.
The appointments of Locomotive Superintendent and Assistant Locomotive Superintendent have recently formed the subject of a specific agreement with the officers holding the present positions.
The Superintendent of Carriage and Wagon Department to receive £500 per annum, rising by £25 per annum to £650.
Senior Draughtsmen to receive £350 per annum, rising by £25 per annum to £500.
The Accountant to receive £350 per annum, rising by £20 per annum to £450.
Assistant Draughtsmen to receive £250 per annum, rising by £20 per annum to £350.
Junior Draughtsmen to receive £150 per annum, rising by £15 per annum to £225.
Chief Inspector to receive £350 per annum, rising by £20 per annum to £450.
District Inspectors to receive £225 per annum, rising by £15 per annum to £300.

Chief Accountant’s Department.
The Chief Accountant should receive £700 per annum, rising £50 per annum to £900. / The Audit Accountant should receive £550 per annum, rising by £25 per annum to £650.
The Cashier should receive £550 per annum, rising by £25 per annum to £650.
The Chief Book-keeper should receive £500 per annum, rising by £25 per annum to £650.
Stores Department.
The Stores Superintendent should receive £700 per annum, rising by £50 per annum to £900.

  The Chief Clerk should receive £350 per annum, rising by £20 per annum to £450.

  The Accountant should receive £300 per annum, rising by £20 per annum to £400.

  The Chief Storekeeper should receive £250, rising by £20 per annum to £350.

District Storekeepers should receive £225 per annum, rising by £15 per annum to £300.

  Officer in charge of Printing Department should receive £250 per annum, rising by £20 per annum to £350.

Electrical Department.
The Electrical Engineer should receive £650 per annum, rising by £50 per annum to £900.

  The Assistant Electrical Engineers, Durban and Pietermaritzburg, should receive £350 per annum, rising by £20 per annum to £450.

Labour Department.
The Labour Superintendent should receive £500 per annum, rising by £25 per annum to £650.

Clerical Staff.
Chief Clerks in Administrative Offices only, viz., Secretary’s, Goods Manager’s, Superintendent of Line, Engineer-in-Chief’s, Locomotive Superintendent’s, and Chief Accountant’s should receive £500 per annum, rising by £25 per annum to £650. /

<table>
<thead>
<tr>
<th>Class</th>
<th>Minimum</th>
<th>Rising by</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>£375</td>
<td>£25 p.a.</td>
</tr>
<tr>
<td>Second</td>
<td>£250</td>
<td>£20 p.a.</td>
</tr>
<tr>
<td>Third</td>
<td>£150</td>
<td>£15 p.a.</td>
</tr>
<tr>
<td>Apprentice</td>
<td>£60</td>
<td>£10 p.a.</td>
</tr>
</tbody>
</table>

Apprentice (after 6 months probation and the passing of a satisfactory examination in duties performed)

  £100

During probationary six months, £3 per month.
Uniform Staff on Salaried List.

Station Foremen (who should in future be designated Station Inspectors), having been placed on the Salaried List, should, on appointment, receive £225 per annum, rising by £15 per annum to £270.

Running Shed and Workshop Foremen in the Locomotive Department on appointment to receive £250 per annum, with a yearly increment of £20 to £350 per annum.

Foremen in Stores Department, if placed on Salaried List, to receive £200 per annum, with a yearly increment of £15 to £260.

Employés to Be Removed from Salaried List.

The Checking Staff should form part of the Wages Staff and receive the following rates of pay:–

Checkers.

First year:

Probationary 3 months ... ... 8/- per day
Remaining 9 months ... ... 9/- '' ''
Second year ... ... ... 10/- '' ''
Third year ... ... ... 11/- '' ''
Fourth year ... ... ... 12/- '' ''

Foremen Checkers.

First year ... ... ... 12/- '' ''
Second year ... ... ... 13/- '' ''
Third year ... ... ... 14/- '' ''

The Employés in the Printing Department, which, as already recommended, should be attached to the Stores Department, should receive the rates of wages prevailing in the trade, with the exception of the officer in charge, who should be attached to the Salaried Staff. /

Notes.

1. The clerical scale I recommend should apply to all Offices and Departments according to rank and the importance of the work, and provides the rate of remuneration to be paid to the staff, who should be placed in the respective classes according with their present salaries, plus the bonus of 10%.

2. In special cases through length of service or superior merit, when the maximum of the class has been reached, and employé at the sole discretion of the Commissioner may be raised to the next higher class.

3. The scale of salaries applicable to each class of Station, Agency, Office or Department should be circulated amongst the members of the staff concerned.
4. I recommend that the positions of Passenger and Parcels Agents should be abolished, and the Station Master at each place should be held responsible for the performance of the duties attaching to these positions.

5. The subjoined list indicates certain alterations in the positions and designations of the various officers, which I recommend as the result of careful consideration of the scheme I have submitted for the reorganisation of the Railway Staff:–

**NEW DESIGNATIONS AND OFFICIAL POSITIONS.**

Commissioner of Railways.

Secretary to Commissioner.

Traffic Dept.

- Goods Manager.
- Superintendent of the Line.
- Divisional Traffic Supts.
- District Goods Manager.
- District Traffic Supt., Johannesburg.
- Goods Agents, Point and Durban.
- Station Inspectors.

Engineering Dept.

- Divisional Engineers.

Locomotive Dept.

- Assistant Locomotive Supt. and Works Manager.
- Divisional Locomotive Supts.
- Superintendent of Carriage and Wagon Dept.
- Locomotive Accountant.

Accountant’s Dept.

- Audit Accountant.
- Travelling Auditors.
These new positions will not necessarily mean the appointment of additional staff, but the promotion, transference, or higher designation of members of the existing staff.

I trust the recommendations I have made in this Report, with the object of securing the efficient working and administration of the Natal Railway Service, will meet with the approval of the Government. They are founded on a lengthened experience of railway working and management, and their adoption would, I have every confidence, be attended with beneficial results to the Colony at large.

In conclusion, I would like to place on record that during the whole of my enquiries I have received the greatest assistance from all the responsible officers of the Department. The promptitude with which the numerous statements and returns I asked for were supplied deserves the most ample acknowledgment. To the General Manager, his Assistants, the Engineer-in-Chief, Superintendent Engineer of Construction, and Maintenance Engineer, my special thanks are due and are most gratefully tendered for the courtesy shewn to me under all circumstances and for the facility with which I was enabled to fulfil my mission.

To Mr. C. W. F. Harrison, who was placed unreservedly at my disposal, and has acted throughout as my Secretary, I am particularly indebted for the most unremitting attention and assistance. The whole of his time, since I began my enquiry up to the present, has been devoted to the work. His accurate knowledge, and his able and intelligent appreciation of railway business has very considerably lightened my labours, and I trust his future career may be attended with all the success it deserves.

I have the honour to be,

Sir,

Your obedient Servant,
## APPENDIX A.

### RAILWAY STATISTICS.

#### AUSTRALASIA., CAPE COLONY AND NATA. 

<table>
<thead>
<tr>
<th>PARTICULARS</th>
<th>AUSTRALASIA</th>
<th>CAPE COLONY</th>
<th>NATAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>QUEENSLAND. Year ended June 30, 1902.</td>
<td>NEW SOUTH WALES. Year ended June 30, 1901.</td>
<td>VICTORIA. Year ended June 30, 1901.</td>
</tr>
<tr>
<td>Area in square miles</td>
<td>668,224</td>
<td>309,175</td>
<td>87,884</td>
</tr>
<tr>
<td>Whites</td>
<td>510,515</td>
<td>1,379,890</td>
<td>1,208,705</td>
</tr>
<tr>
<td>Coloured</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miles open</td>
<td>2,800</td>
<td>2,845</td>
<td>3,238</td>
</tr>
<tr>
<td>Gauge</td>
<td>3 ft. 6 in.</td>
<td>4 ft. 8 ½ in.</td>
<td>5 ft. 3 in.</td>
</tr>
<tr>
<td>Total capital expended on open lines</td>
<td>£20,119,143</td>
<td>£38,932,781</td>
<td>£40,145,404</td>
</tr>
<tr>
<td>Average cost per mile open</td>
<td>£7,184</td>
<td>£13,682</td>
<td>£12,399</td>
</tr>
<tr>
<td>Population per mile of railway</td>
<td>182</td>
<td>485</td>
<td>373</td>
</tr>
<tr>
<td>Whites</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coloured</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year ended Dec. 31, 1901.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year ended Dec. 31, 1901.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year ended Dec. 31, 1902.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Whites</td>
<td>£39 8s. 2d.</td>
<td>£28 4s. 3d.</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Cost per head of the Pop-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ulation (Coloured)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross earnings</td>
<td>£1,382,179</td>
<td>£3,573,779</td>
<td>£3,337,797</td>
</tr>
<tr>
<td>Working expenses</td>
<td>£992,751</td>
<td>£2,043,201</td>
<td>£1,984,796</td>
</tr>
<tr>
<td>Profit on working (after</td>
<td>£389,428</td>
<td>£1,530,578</td>
<td>£1,353,001</td>
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<tr>
<td>paying working expenses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of net earnings to capital expended on open lines</td>
<td>£1 18s. 9d.</td>
<td>£3 18s. 8d.</td>
<td>£3 7s. 5d.</td>
</tr>
<tr>
<td>Percentage of working expenses to earnings –</td>
<td>25.19</td>
<td>13.56</td>
<td>15.53</td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locomotive</td>
<td>27.84</td>
<td>26.23</td>
<td>23.77</td>
</tr>
<tr>
<td>Traffic</td>
<td>16.16</td>
<td>15.48</td>
<td>18.48</td>
</tr>
<tr>
<td>General</td>
<td>2.64</td>
<td>1.90</td>
<td>1.68</td>
</tr>
<tr>
<td>compensation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Expenditure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>71.83</td>
<td>57.17</td>
<td>59.46</td>
</tr>
<tr>
<td>Earnings per average mile open –</td>
<td>£493.54</td>
<td>£1,268.20</td>
<td>£1,033.85</td>
</tr>
<tr>
<td>Working expenses per average mile open –</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locomotive</td>
<td>£124.33</td>
<td>£172.02</td>
<td>£160.60</td>
</tr>
<tr>
<td>Traffic</td>
<td>£137.42</td>
<td>£332.19</td>
<td>£245.73</td>
</tr>
<tr>
<td>General</td>
<td>£79.74</td>
<td>£194.58</td>
<td>£191.09</td>
</tr>
<tr>
<td>Compensation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Expenditure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>£354.49</td>
<td>£725.05</td>
<td>£614.77</td>
</tr>
<tr>
<td>Earnings per train mile</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4s. 10½d.</td>
<td>6s. 7½d.</td>
<td>6s. 0½d.</td>
</tr>
<tr>
<td>Category</td>
<td>1s. 2¾d.</td>
<td>0s. 10¾d.</td>
<td>0s. 11¼d.</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>Working expenses per train mile – Maintenance</td>
<td>1s. 4½d.</td>
<td>1s. 8½d.</td>
<td>1s. 5½d.</td>
</tr>
<tr>
<td>Locomotive</td>
<td>0s. 9½d.</td>
<td>1s. 0½d.</td>
<td>1s. 1¾d.</td>
</tr>
<tr>
<td>Traffic</td>
<td>0s. 1½d.</td>
<td>0s. 1¾d.</td>
<td>0s. 1¾d.</td>
</tr>
<tr>
<td>General</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compensation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Expenditure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3s. 6d.</td>
<td>3s. 9½d.</td>
<td>3s. 7d.</td>
</tr>
<tr>
<td>Earnings per engine</td>
<td>£3,791</td>
<td>£7,161</td>
<td>£6,228</td>
</tr>
<tr>
<td>Earnings per carriage (coaching)</td>
<td>£1,003</td>
<td>£1,269</td>
<td>£961</td>
</tr>
<tr>
<td>Earnings per wagon (goods)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earnings per head of the population</td>
<td>£125</td>
<td>£199</td>
<td>£185</td>
</tr>
<tr>
<td>Number of passengers</td>
<td>*4,636,174</td>
<td>*29,261,324</td>
<td>*54,704,062</td>
</tr>
<tr>
<td>Goods Tonnage</td>
<td>1,725,520</td>
<td>6,197,188</td>
<td>3,155,697</td>
</tr>
<tr>
<td>Live stock tonnage</td>
<td>156,050</td>
<td>200,339</td>
<td>226,163</td>
</tr>
<tr>
<td>Average number of passengers per mile of railway</td>
<td>1,655</td>
<td>10,384</td>
<td>16,944</td>
</tr>
<tr>
<td>Train mileage</td>
<td>5,666,058</td>
<td>10,763,697</td>
<td>11,066,016</td>
</tr>
<tr>
<td>Average train miles per mile of</td>
<td>2,023</td>
<td>3,820</td>
<td>3,428</td>
</tr>
</tbody>
</table>
### APPENDIX B.

NATAL GOVERNMENT RAILWAYS.

Statement of the Number of Persons Employed as at 31st December, 1902.

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>General Manager</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Assistant General Manager</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
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<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Engineer in-Chief</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>1</td>
<td>...</td>
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<td>...</td>
</tr>
<tr>
<td>Engineer of Construction</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
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</tr>
<tr>
<td>Maintenance Engineer</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>1</td>
<td>...</td>
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<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Locomotive Superintendent</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>1</td>
<td>...</td>
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</tr>
<tr>
<td>Chief Foreman – Loco. Workshops</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Assistant Traffic Manager</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Chief Accountant</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Stores Superintendent</td>
<td>...</td>
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<td>...</td>
<td>...</td>
<td>...</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>District Superintendents</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
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</tr>
<tr>
<td>District Traffic Agent, Johannesburg</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
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<tr>
<td>District Locomotive Foremen</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>4</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Assistant Engineers</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>4</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Electrical Engineer</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Assistant Electrical Engineers</td>
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<td>...</td>
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<td>...</td>
<td>...</td>
<td>2</td>
<td>...</td>
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<tr>
<td>Engineering Surveyors</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
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*Note.* – The Indian and Native Labour is a feature of the Service difficult to accurately gauge, as the numbers fluctuate so frequently and it is also difficult to apportion the several numbers to the respective grades in which the Indians and Natives may be employed, but this information is given in the Statement as far as it could be ascertained. Generally speaking, however, Indians and Natives are employed as Labourers in the Locomotive and Maintenance Departments, and as Porters, Pointsmen and Gatekeepers in the Traffic Department, and in any other capacities in the several Departments for which their intelligence proves them suitable.
SOUTH AFRICAN RAILWAY AND HARBOURS AFFAIRS
COMMISSION, 1933.
MEMORANDUM ON
RAILWAY AND HARBOURS WORKING AND FINANCE

By
Professor S. Herbert Frankel,
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(1) This memorandum will endeavour to draw attention to fundamental matters, and will so far as possible avoid questions of detail. It will also endeavour to make certain constructive suggestions as regards future policy. As far as is consistent with the continuity of the Memorandum itself, and in order to prevent undue length, it will endeavour to avoid the repetition of facts or opinions which have been published elsewhere.

It will be necessary to refer somewhat frequently to the writer's book 'The Railway Policy of South Africa'. I beg, therefore, herewith, to submit this publication to the Commission, and to point out that it deals directly with a number of questions falling within the terms of reference.

The book is in certain easily recognizable respects partly out of date, as it was written some six years ago. In the years that have elapsed since its publication, changes in Railways and Harbours affairs have of course been made in various directions. The depression has affected the finances and the staff of the Railways and Harbours, certain rates have had to be increased, and certain financial adjustments (e.g. the over-payment of interest to the Treasury on Capital contributed out of Railway and Harbours revenues) to which I drew attention in
par. 35–45 of my book, have now been made. On the whole, however, the writer is of the opinion that no changes of sufficient importance have occurred to cause him to desire to revise the main conclusions in the book.*

(2) The paramount importance to the economy of the Union of efficient and economical transport, needs little emphasis.

The Economic and Wage Commission estimated that transport was responsible for £16 m. out of a total net national income in 1923 of £186 m. Taken by itself, this comparison seriously understates the real importance of transport. Apart from the fact that it does not include other than Railway transport, it is apt to be misleading because in fact, the real importance of transport cannot be indicated by statistics, which compare its net productivity with that of other industries of the Economy.

This matter is mentioned here, because too frequently the importance of transport undertakings is expressed in some such manner. Attention is directed to their size, or profits, or net revenues in comparison with other industries. All such comparisons miss the main point in regard to transport undertakings, i.e. the direct and indirect effects on the economy as a whole, on the size of its national income, and on the success of the separate enterprises of the economy. In so far as efficient, cheap and economical transport is provided, an immeasurable number of avenues of economic profit are opened up, which at a higher level of transport, could not and would not be exploited.

(3) The size of the net national income of community depends on the intensity of the economic exploitation of all its resources. / In a modern economy such exploitation depends to an enormous degree on the efficiency and cost of transportation. The demand for transport is quite definitely highly elastic, i.e. the cheaper, the more efficient and the speedier it is, the greater will be the proportionate demand for it – even though the demand at the lower railway charge may take longer to develop than in the case of price reductions applying to other

*The Railway Policy of South Africa’ was written as the result of certain investigations which the writer had been asked to undertake. These investigations led him contrary to his original intentions, to write at length on certain aspects of Railway policy in the Union. The book was not intended to be a treatise on Railway economics, or a description of Railway development or working in the Union. It was written primarily for the purpose of calling attention to what the writer considered to be defects of railway policy in South Africa. Much that was satisfactory in regard to Railway and Harbours affairs, or that was not germane to the main purpose of the book had to be omitted. The main object of the book was to press for a thorough examination of railway affairs by overseas experts, the need for which appeared as the previous investigation drew to a conclusion. It should also be noted that the work on which the book was based was undertaken under very difficult circumstances, as the author had practically no other information available than such as is regularly published by the Railways for the use of the public.
goods and services. Moreover, modern communities tend, the wealthier they become, to demand an increasing amount of transport service as an end in itself.

Considerations such as these are frequently overlooked, as for example when attempts are made to judge whether transport service is or is not ‘adequate’. Such a term has in itself no meaning. At one price a certain amount of transport will be ‘adequate’, which at a different price will obviously be the reverse.

(4) There is, in the opinion of the writer, only one basic test of the ‘adequacy’ of transport service and that is whether or not the service is produced with the greatest efficiency, and sold at the lowest possible real economic costs commensurate therewith, and is of the kinds, and is supplied in the quantities which are demanded at that price by the consumers of the transport service. In this connection it will not be amiss to quote an illustration given by Professor Lionel Robbins¹ (Professor of Economics in the University of London) of the confusion between technical potentiality and economic value (that is power to satisfy demand) which is so common. The fallacy he writes:

‘also underlies certain notions at present unduly prevalent with regard to the value of fixed capital. It is sometimes thought that the fact that large sums of money have been sunk in certain forms of fixed capital renders it undesirable, if consumer’s demand changes, or if technical invention renders it possible to satisfy a given consumer’s demand in other more profitable ways, that the capital should fall into disuse. If the satisfaction of demand is assumed as the criterion of economic organisation, this belief is completely fallacious. If I purchase a railway ticket from London to Glasgow, and half-way on my journey I receive a telegram informing me that my appointment must take place in Manchester, it is not rational conduct for me to continue my journey northwards, just because I have ‘sunk capital’ in the ticket is still as ‘technically efficient’ in procuring me the right to go to Glasgow. But my objective has now changed. The power to continue my journey northward is no longer valuable to me. To continue nevertheless would be irrational. In Economics, as Jevons³ remarked, bygones are forever bygones.

‘Exactly similar considerations apply when we are considering the present status of machinery for whose products demand has ceased, or which has ceased to be as profitable, taking everything into account as other kinds of machinery. Although the machinery may be technically as efficient as it was before these changes, if the change in demand or in cost of conditions which led to its supercession had been foreseen, the disposition of resources would have been different. In that sense it is not meaningless to speak of a waste due to ignorance. But once the change has taken place, what has happened before is totally irrelevant – it is waste to take it into further consideration.’

¹ Cf. Robbins: An Essay on the Nature and Significance of Economic Science. Macmillan, 1932. The following extracts may be given to supplement the above quotation: (p. 44).
(5) Interferences, therefore, which either:
(a) prevent the production of transport service at the lowest possible eco-
nomic cost, and its sale at a price suited thereto,

or (b) artificially restrict the kind, or quality, or efficiency of the transporta-
tion service which can be economically supplied

are bound to cause transport services to become inadequate in certain direc-
tions, and are bound further, to have a detrimental effect on the economy as a
whole. The most important factor influencing the efficiency with which, and the
real level of costs at which, a transport undertaking can function, is the nature of
the system under which it is managed, and the influences which determine the
policy of the management.

MANAGEMENT & GENERAL POLICY OF THE SOUTH
AFRICAN RAILWAYS & HARBOURS

(6) It was emphasised before Union and it has been reiterated ever since that the
most important single factor in the Union’s transport policy is the need for the
management of the Railways and Harbours on ‘business principles’. (Cf. Section
127 of the South African Act)

This term as I indicated in ‘The Railway Policy of South Africa’ was not
definitely defined, but it is quite clear that the framers of the Act of Union and
the National Convention intended that it should mean that the Railways and
Harbours were to be managed in the manner technically, and economically best
suited to the efficiency of the undertaking, and that influences not germane
to that efficiency and to the economic conduct of the undertaking were to be
excluded (see pages 55–77 of ‘The Railways Policy of South Africa’)

(7) At Union the members of the National Convention embarked on the
experiment of building up a state undertaking, which should, nevertheless, be
free from the well known evils of state ownership, and direct state management
(i.e. the administration of the undertaking on the lines of the administration
suited to a Government Department). I have indicated in Chapter I of my book
why this experiment failed. Briefly it failed because it was at no time given a real
chance of succeeding, and because the necessary machinery for ensuring success
was not devised.

‘Thus wealth is not wealth because of its substantial qualities. It is wealth because it is
scarce. We cannot define wealth in physical terms as we can define food in terms of vita-
min content or calorific value. It is an essentially relative concept ... So, too, when we
think of productive power in the economic sense, we do not mean something absolute
– something capable of physical computation. We mean power to satisfy given demands.
If the given demand change, then productive power in this sense changes also’. /
In practice the South African Railways and Harbours have for years been, and are to-day administered purely and simply as a department of State and suffer from all the well known evils of the administration of an industrial undertaking on State departmental lines. (Cf. Par. 18-21 Pp. 63–65 of ‘The Railway Policy of South Africa’, and the quotations from / the ‘East Indian Railway Committee’s Report’ p. 109, and also the whole of Chapter 2 of ‘The Railway Policy of South Africa’.) In the final resort, the present method of separating the Railways’ and Harbours’ budget from the general budget of the country, though it has certain advantages, does not alter the basic fact that the Railways and Harbours are run purely on State departmental lines.

(8) All the evils which at Union it was foreseen and feared might hamper the South African Railways and Harbours have in fact been experienced. (Cf. Railway Policy of S. A.)

(9) The paramount importance of freeing public undertakings such as the Railways and Harbours from political, sectional, or district influences of this nature has been emphasised in every country, where the Railways are owned by the State. Commission after commission in these countries (e.g. Austria, India, New Zealand and Canada) has drawn attention to this fact. As recently as 1932 the Royal Commission on Railways and Transportation in Canada reported:—

Page 50. 143. The majority recommendations of the Royal Commission on Railways and Transportation in 1917 were designed to provide safeguards against political interference which is instinctively to be feared in the conduct of public enterprise of the magnitude and character of the Canadian National Railways. But the Government of the day declined to follow the plan for organisation recommended by the Commission, which was in substance to place control in a permanent and self-perpetuating Board of Trustees.

144. There was adopted, instead, the plan which is contained in the Canadian National Railway Act. This Act provides for a Board of Directors to a maximum number of seventeen, appointed by Order in Council, holding office from year to year. Appointment to the office of chairman of the board and president of the company is made by the Government, and concurred in by the board.

145. Under the circumstances, the directors’ functions have been in practice nothing more than advisory. It would seem that they generally gave formal approval to programs of expenditures which they appeared to regard as the main concern of the president and the Government. This left the Railway open to political influence and to public pressure exerted by communities and by associations of business and labour interests.

146. Of direct political interference by ministers and members of Parliament in the detailed operations of the railway, we were assured by the officials there was little or none. It was in the larger sphere of policy that political considerations led to unwise and unnecessary capital expenditures, the result of which was
to create an atmosphere in which the ordinary principles of commercial operation of the railway were lost sight of.

147. The President of the Canadian National Railways, in a considered statement to this commission in the course of its inquiry, expressed the following views:

‘One of the inherent disadvantages of any state-owned enterprise such as the Canadian National Railway, is the problem of political interference – and one might also add public pressure. In making this statement I wish it distinctly understood that I imply no criticism of any party or any government, present or past. I merely state a fundamental and universally admitted condition.’

‘The leaders of all political parties and the people of Canada as a whole are a unit in their desire to prevent political invasion of the Canadian National Railway. But the plain fact is that, irrespective of such wishes and desires, the problem presents difficulties beyond the control of our leaders, be they ever so patriotic or high minded. After all in any form of popular government it must be accepted as axiomatic that the business of government is politics and, irrespective of whether one likes it or not, politics is something with which a government must reckon in all its activities.’

148. The President of the Canadian Pacific appeared to be more concerned over the activities of what he termed ‘politically minded’ executives of the publicly owned railway than he was over straight political pressure for definite ends. He said:

‘We talk a great deal about political interference being damaging to railway operations, and we know that that is true, generally speaking. But when we say it we seem to think that the only political influence is that exercised by a government, or a member of government, or a member of parliament. To my mind the worst comes from the political attitude of men in publicly-owned institutions. Possibly they are not conscious of it, but they become politically minded; their policies and actions have a political tinge, and that, from my standpoint, is more serious as representing the attitude of the corporation than the isolated act of a member of parliament who tries to get a man employed.

‘Years ago the ability of privately-owned railway companies to withstand political pressure was somewhat limited. Today it is nothing like what it was, because we can say ‘no’ to that kind of pressure. But the politics that develop inside an organisation because it is publicly-owned, and not privately-owned, is a serious thing.

‘We spoke of not being able to anticipate what government policies would be towards any railway, and I believe we cannot tell from year to year what the policy of any government would be in respect of its railway property. Providing it owns it, and has a measure of control of its policies, and so long as they are putting up the money we cannot avoid that possibility.’
(10) The experience of the South African Railways and Harbours since Union leads to the conclusion that no basic and permanent improvement, in the service of the South African Railways and Harbours can be expected in the future, unless the present system of management is altered, and unless the South African Railways and Harbours cease to be administered as a department of state. A renewed attempt must be made to carry out the aims of the South African National Convention that the Railways and Harbours should be managed by a body separated from the influences of the government of the day.

Quite apart from the need of increasing the efficiency of the railway system, in the handling, conveyance, and care of freight, it is clear all over the world that the railway industry of the future will be radically different from that of the past. For example, if complete use is to be made of the new forms of transport by road the railways will have to adapt themselves to them. In order to do so they must have a flexible form of organisation and control, and their policy must be guided by imagination and vision. They must eliminate many of the traditional services of the past and concentrate on others, such as express long-distance traffic, which fit into the new scheme of things developing before their eyes. In South Africa they must cut, once and for all, their own and the country’s losses, through the investment of capital (e.g. in branch railway lines) which no longer serves economic purposes commensurate with its cost. At the same time they must incur much new capital expenditure in order to bring about those savings in working without which the re-organisation of the railway system and the reduction of transport costs will not be possible. Above all it must be realised that it is of no advantage to the country if traffic is retained by methods which obstruct new development rather than by those which stimulate it.

11) Apart from the disadvantages of state departmental management referred to above there is no doubt that this form of administration / does not provide the elasticity, enterprise, and adaptability which will be necessary in an ever increasing degree in the future from the lack of which the Union has already suffered considerably in the past. The time is ripe for a frank realisation of the fact that what is needed now, is a managing body with keen initiative, able to plan ahead, able to adapt its plans quickly to new circumstances, able to experiment freely, and able to take complete responsibility unhampered by outside and non economic considerations.

I beg therefore, to put forward once again, proposals which have made in different forms on previous occasions, particularly the Addendum to ‘The Railway Policy of South Africa’ pages 251–262 The Future Control and Management of the South African Railways & Harbours’).
The proposals can be briefly summarised as follows:— *

1. That the South African Railways and Harbours cease to be managed by the State, under the present system of a Minister of Railways and a Railways and Harbours Board;

2. That a Board of Trustees be constituted by Act of Parliament and incorporated as 'The South African Railways and Harbours Company', and that the Trustees be directors of the company;

3. That the ownership of the South African Railways and Harbours be vested in this company;

4. That all matters of policy, of finance, of the service of the debts of the company, and of working conditions connected with the operation of the Railways and Harbours be decided by the directors alone;

5. That it be decided before the incorporation of the Company what amount of debt is to be regarded as Railways and Harbours debt, and to what extent, and in what manner the Government assume responsibility to the Company for any securities, shares or debentures issued or to be issued by it.

The Trustees might be nine in number. The first Trustees could be named in the Act of Parliament constituting the Board. Only five of the Trustees should be full-time members of the / directorate of the company. They should be most carefully chosen.

If any trustee should lose, resign, or vacate the position or office, or qualification in virtue of which he was especially appointed a trustee, his trusteeship should automatically cease. In all other respects the tenure of office of the Trustees should be the same as Judges of the Supreme Court. In order to secure that influence and control of Parliament which is desirable in the constitution of semi-autonomous bodies such as the South African Railways and Harbours Company, the Act or Charter incorporating the company should lay down clearly, and in such detail as is thought desirable, the policy to be pursued by the company. It would therefore define, as in the South Africa Act, the profits, if any, to be allowed. It should certainly contain provisions (as already mooted in the Selborne Memorandum) that the rates charged by the company shall be (a) reasonable and (b) just. The provisions should be similar to those of the famous Interstate Commerce Act. They should be administered by the judicial Railway Rates Tribunal or by a similar body.

The Act of Incorporation should also contain provisions enabling the company to enter into agreements with the Government, or any State Department, under which special rates are charged, or special lines are built for developmental purpose, and under which the company would receive payment from these

bodies for undertaking such functions as it deems beyond its sphere of action. The Act should lay down clearly the powers of the company in these matters, and should restrict its functions in regard to special rates, gratuitous services or uneconomic policies granted for other than railway purposes, unless losses occurring therefrom be refunded to it.

The nominal share capital of the company (other than that offered to the public) should be registered as held in the joint names of each particular trustee and the Minister of Finance for the time being. The trustee should exercise the voting power in the company. The Act of Incorporation would provide that no share could be transferred except to a duly appointed trustee and that the shares are held in trust for the Union of South Africa.

(13) Further details in regard to this proposal are discussed in the Addendum to ‘The Railway Policy of South Africa,’ and on pages 283–288 of Chapter IV, ‘Road and Rail Transport’ of ‘Coming of Age.’ These details should, however, be regarded as given only for the sake of illustration.

The points requiring particular emphasis are that:—

(1) The control and management of the Railways and Harbours should be in the hands of a public semi-autonomous body.

(2) The directing board of such a body should be self-perpetuating and permanent, i.e. none of the members should feel that their reappointment depends upon the good will of the Cabinet or the Government in power.

(14) I should like to add to the scheme outlined the following suggestions:—

(a) That it would strengthen the independence of the new body if part of the shares of the new company were offered to investors in the usual way – particularly so far as new capital is raised.

(b) That at least one (and possibly two) of the directors or trustees be an overseas expert of high standing, who would approach the problem of the future re-organisation of the Railways and Harbours with an open mind, and with modern experience of other Railway systems.

PROBLEMS OF RAILWAYS AND HARBOURS POLICY – CAPITAL AND STAFF.

(15) It will be convenient at this stage to indicate some of the directions in which the continuance of Departmental Administration would prove most detrimental and in which the future management of Railways and Harbours can make great changes with considerable advantage.

Apart from any questions of railway rate policy (which is dealt with later in this Memorandum) the most important problems facing the Railways and Harbours will undoubtedly be connected with the problem of adapting (a) the
present physical plant and its capitalisation and (b) the organisation of the staff, to the needs of the future.

(16) There can be no doubt that a large part of the past investments of railway capital were made in the wrong direction and were unprofitable, or entailed an absolute loss from the beginning, or have become unprofitable owing to economic changes in the Union, or else will become unprofitable if such other means of transport are to be adopted which are in the future interests of the economy of South Africa.

There can also be no doubt that the physical plant of the Railways and Harbours needs expansion and alteration on an extensive scale, if (a) operating costs are to be reduced (b) efficiency is to be increased and the railways system adjusted to modern requirements of freight and passenger transport* (c) other means of transport are to be incorporated in, and adapted to, the Railway system.

(17) So far as possible, the new management of the Railways and Harbours (in whatever way it may be constituted) should be hampered as little as possible by mistakes of the past. The capitalisation of the Railways and its interest obligations to the Treasury, should now be so adjusted that the Railways and Harbours services will not be burdened in the future with an inflated interest charge. The management should be able to plan new developments without the need of raising revenue to cover the cost of past failures – particularly as a very great part of those failures was directly or indirectly, due to the interferences of the Treasury and the Government which / caused important and necessary capital developments (e.g. improvements of railway facilities such as goods yards, stations, etc., which would have reduced operating costs) to be shelved, and uneconomic capital expenditure (e.g. unpayable branch lines) to be substituted in its place. It is doubtful, if such relief is not given, whether that reduction in the general level of rates can be brought about by other means which is sufficient to stimulate traffic and to warrant the improvements in the speeding up of railway service, which are essential for the future development of the Union.

(18) The new management whether it be in the form of a company as suggested above, or not, might with advantage be given authority to raise capital on its own initiative, by the issue of its own securities and bonds. This will be an aid to obtaining additional flexibility in the operation of the Railways and Harbours. The present system of financing does not allow of the easy writing down of losses. If investors could be got to bear part of the risk of Railway and Harbour development this might prove beneficial.

In this connection I should like to express the opinion that the belief that by preventing the Railway Administration from earning ‘profits’ transport is thereby

* E.g. In the adequate mechanisation of clerical and accounting work – in the introduction of labour saving devices – in new methods of packing, removal and delivery of goods etc.
cheapened is fallacious. Experience in South Africa shows quite clearly that such a provision does not necessarily lower the cost of transport in any way. For obviously the matter of real significance is the level of railway rates and charges needed to bring about a balance of railway expenditure and railway earnings. It does not follow that if earnings exclude profits, that they will therefore ensure a low level of railway expenditure. On the contrary it is quite likely that they may do the reverse. A rigid balance between revenue and expenditure tends to be aimed at, and there is apt to be insufficient incentive to lowering expenditure and operating costs. In the place of the scrutiny of the railway accounts by interested shareholders and directors the only check on the Railway Administration at present is that of Parliament (which is almost useless) supplemented by the necessarily rigid outlook of the Treasury and the Auditor General’s Departments.

(19) Just as the management of the Railways and Harbours should in future be relieved of the burdens of past mis-application of capital, so it should be freed from the burden of uneconomic influences in regard to staff policy. It is of very great importance that an industrial undertaking of the magnitude of the Railways and Harbours should be free to build up a loyal, efficient and well trained staff in the manner best suited to the functions of the undertaking. There should be relevant standards of recruiting, promotion, training and dismissal, based on modern principles of labour policy, and uninfluenced by principles that may or may not be suited to the Government service, but are certainly not of the kind leading to maximum efficiency in a commercial undertaking.

Outside pressure leading to the employment of men who would otherwise not be employed by the undertaking, or to the dismissal of men who would otherwise not be dismissed, or to the adoption of labour policies, or scales of remuneration that would otherwise not be adopted, is a cancer in the working of every industrial undertaking.

Moreover, the management should be free to draft into the undertaking experienced senior officials, who may be of service to it. In the past the Railways and Harbours have been starved of new men from outside with experience of modern developments in other Railway systems.

The bureaucratic attitude of self sufficiency has even affected the training of existing members of the railway staff. It is highly significant that a keen servant of the administration, anxious to take a University degree, is not even allowed time off for writing University examinations (other than the time he is willing to sacrifice from his holiday leave). There is not sufficient encouragement for him if he succeeds in completing his studies or scope given for post-graduate work.

The railway managements of America have encouraged young men to make themselves highly proficient by taking advantage of the / economic and commercial courses provided at Universities, and they have held out to them prospects of advancement if they displayed originality, and interest in the administra-
tion of their companies, or in their technical problems. Intimate contact has been established with Universities for special courses in railway administration and policy. As a result of this railway companies have reaped large rewards in improved administration, greater efficiency, better relations between the staff and the administration, and better relations between the staff and the public. Without a similar policy in this country, basic improvements will not be made. Bureaucratic regulation kills the soul of the railway servant. Discontent is driven underground by the stringency of regulations, but it does not disappear, for it remains to affect railway efficiency and operating costs. Up to now, practically no use whatever has been made of the Universities in South Africa by the Railway Administration, only in regard to routine courses at technical colleges has there been some co-operation between the Administration and existing educational authorities.

(20) There can be no doubt that that natural courtesy, friendliness, and good fellowship of the railway staff in South Africa lend themselves particularly, to the application of modern ideas in regard to labour policy. /

RAILWAY RATE POLICY.

(21) The Railway Rate policy of the South African Railways and Harbours Administration has been examined in detail by the writer in Chapter III, pages 142–218 of ‘The Railway Policy of South Africa’. No good purpose would be served by a repetition in this Memorandum of the main conclusions arrived at as a result of that investigation. Those conclusions have been severely criticised, and I therefore beg to be permitted to place on record, that after much further consideration of them, I am compelled to state that, apart from questions of detail, and apart from the portion of the analysis which admittedly consisted of estimates (e.g. the estimates of the possible extent of the reduction in railway rates under various circumstances. I am still of the opinion that the general analysis and the conclusions arrived at, are in principle justified, and applicable to the present rate policy and tariff of the Railways.

(22) I should, however, in regard to the whole analysis, like again to emphasise the following considerations:–

1. The present rate policy and the present railway tariff are in many respects contradictory, and are out of date; they cannot be reconciled with principles of reasonableness in rate making, or with principles that require considerations such as cost of service, weight, convenience of handling, and the value of the commodity to be given adequate attention in the rates classification, and the charges corresponding thereto.

2. The reasons for this state of affairs are not difficult to find. Firstly, adequate legislation has not been passed in South Africa to bring about the construction
of the railway tariff according to given principles of reasonableness, and given principles of rate making, e.g. such as those to which due weight must be given in determining railway rates in Great Britain, (under the Railways Act 1921) or such as those governing the rulings of the Interstate Commission in the United States of America.

Secondly, the Railways have by direct and indirect means, been placed in the position of providing services of various kinds for which they have been inadequately remunerated, and they have suffered from the financial burdens caused by political circumstances, which factors have necessarily made a railway tariff, based on economic considerations and principles of reasonableness an impossibility.

3. The serious economic effects of the situation that has arisen are not usually appreciated. It is of course always taken for granted that diversions of economic resources which are brought about by artificial means (e.g. by unwarrantedly low railway rates) are necessarily beneficial. But the effects of such a policy – e.g. in artificially raising the cost of living, of construction and of production, in curtailing potential economic expansion, and in lowering the average standard of life, are usually hidden and therefore almost always ignored.

I do not think that it is the function of the Railways and Harbours Administration to deliberately cause artificial diversions of economic resources. The point however, of greatest importance in regard to this policy is that it does not permanently ensure cheap and economic transport service – even for the favoured railway users.

4. It is significant that, notwithstanding the large number of attempts which have been made by the Railway Administration to reduce rates for various special railway users, that not only is the average level of railway rates in the Union very high, but that the many so called special rates are not low when compared with the cost at which similar transportation service is rendered in other countries. This leads to the conclusion that, what is needed is a policy which will reduce railway expenditure, increase railway efficiency, and will thus enable the necessary (reduced) railway revenue to be earned on the basis of a commodity classification and a railway tariff, which is constructed according to defined, sound and reasonable rate making principles. Once this is done, special concessions to some, at the expense of added burdens to others, will not be necessary, and the economy of the Union will be saved much arbitrary interference with the natural development of its resources.

5. In order to further the adoption of a reasonable railway tariff, it is essential that a judicial, highly competent and independent body to hear and adjudicate upon complaints in regard to railway rates, facilities and conditions of service, and to supervise railway rate changes, be established. Such a Tribunal will be of great value not only to the public but to the Railway Administration itself.
Firstly, it will remove railway policy from the arena of politics, and from undue pressure by interested parties. The Railway Administration will be able to fix rates and charges in the knowledge that it will have an opportunity of defending them before a higher authority, should they be challenged. On the other hand, the public will be apt to be less suspicious of rate changes, (the need for which is frequently misunderstood) since an impartial machinery for dealing with complaints will be readily available.

Moreover, such a Tribunal will also strengthen the hands of the Railways and Harbours Administration, in that it will be possible for it to refuse to conduct services, or to charge rates, which are unremunerative. The new system will certainly lead to more careful costing and accounting. Special services which political or government pressure may attempt to force upon the railways, at unremunerative rates, as in the past, will if they are not entirely eliminated, at any rate, be easier to evaluate for the purpose of obtaining compensation from the Consolidated Revenue Fund.

6. It is desirable that the Railways and Harbours Administration be given greater freedom in making particular rates, not necessarily applicable to traffic over the whole Railway system. Rates applying only to certain areas, or between certain stations, or to certain railway users, or individual traders should be permitted. If the Railway Rate Tribunal exists, the danger of abuse to which such freedom in rate fixing is open, will be greatly reduced. The provisions in this connection, in the Road and Rail Bill recently introduced in the House of Commons is a valuable one and should be adopted in South Africa. Without a judicial railway rate tribunal such powers cannot be safely granted.

Finally it must be emphasised again that the cost of railway transport in the Union is too high. Perhaps in no other single direction is it more important that the efficiency of the South African economy should be increased immediately, in order that the Union can hold its own in the export markets of the world, for which purpose it is necessary to reduce the cost of living and production. It was realised before Union that the aim of the new unified state owned Railway System should be the reduction of the level of railway rates and of railway transport charges, as these were already at that time recognised to be unduly high.

Yet notwithstanding the great increase in the volume of railway traffic one finds that in 1933 the average level of railway rates is approximately 50% to 90% higher than in 1914 in the first three class rates of the Railway Tariff for distances up to 250 miles, and correspondingly higher for other distances. The rates are also considerably higher for Class IV and even for lower classes (Cf. page 306. Table G of “The Railway Policy of South Africa” – since 1927, to which Table G. refers, the rates have actually been further increased for the higher class rates/ and for coal). The changes which have taken place in a downward direction since 1914 owing to special rates and preferential concessions on certain articles falling into lower class of the tariff do not appear even to compensate for the rate increases in the lower class rates in general.
At the same time the disastrous fall in the world price levels has affected South Africa in the same way as other countries. World price levels in March 1933 were from 30% to 60% below those ruling in 1929, and well below the price levels ruling in 1914. In some countries the fall has been much greater, and throughout the world agricultural export prices have suffered most.

The burden of the Railway Tariff has in South Africa been increased proportionately by the fall in prices. The table attached to this memorandum brings table E on page 303 of ‘The Railway Policy of South Africa’ up to date for most commodities for which the later information could be readily obtained. (The August 1933 Railway Tariff has been used and the September 1933 wholesale prices are from the Monthly Bulletin of Union Statistics.)

The purpose and meaning of the table is explained on page 159 paragraph 126 of ‘The Railway Policy of South Africa’. The new table in addition to illustrating the proportion which railway rates bear to the value of the commodities included, and in addition to giving an indication of the incidence of railway charges for various distances shows (in the last column) the percentage increase in this burden. The large proportion of the price of important commodities that is now due to railway charges is clear from the table. (It should not be forgotten that a large number of these commodities are transported over long distances between 400 and 600 miles and more). The table illustrates the heavy cost of railway transport to the economy of the Union.

An interesting point which is often overlooked, is that the gap between the prices received by the farmer for his agricultural produce, and prices he has to pay for his industrial products and his requirements as a consumer, is very greatly increased by these high and rigid transport costs.

Special concessions for the conveyance of his agricultural exports do not finally cure this situation since they raise the transport costs on the commodities purchased by him. Other primary producers are in a similar position.

The future course of price levels cannot be forecasted, but already in 1927 railway rates were responsible for a too large share of the cost of living and production in the Union, and South Africa has in common with the rest of the world a long way to go before the price levels ruling in 1927 will be again experienced. Drastic measures are necessary in this country, unless transport costs are to prove a serious obstacle to the future development of the Union.

ROAD AND RAIL TRANSPORT.

The future development of the Railway system is intimately bound up with the growth of transport by road motor vehicles, and is inseparable from the policy which is to be adopted towards the carriage of goods and passengers by road. Apparently, the terms of reference of the Railways and Harbours Affairs Commission exclude the general question of road transport, and specific comments on road transport policy as
a whole, will therefore be omitted from this memorandum. (Certain comments on
the general problem and on the Motor Carrier Transportation Act will be found on
pages 290–295 of the chapter on ‘Road and Rail Transport’ previously referred to).

In so far as the Railways are concerned, it is obvious that in the future they
must develop every possible avenue in which road transport is more efficient, less
costly, or more suited to the requirements of passengers, manufacturers, traders,
aricultural producers, or other transport users. So far this has not been sufficiently
realised by the Railways and Harbours Administration. The outworn notion that
the Railways must do everything in their power to convey every ton of traffic,
which can by any means be forced to go by rail, in order to protect the capital
invested in the Railways still holds sway.

This notion has dominated all recent legislation in regard to road transport, so
much so, that an obviously non-economic situation has now arisen, in that to all
intents and purposes, road transport development, other than that undertaken by the
Railways and Harbours Administration itself, has been strangled. The absurdities to
which recent legislation has led can be indicated by the fact that cases have occurred
where manufacturers or traders (who are in South Africa generally prevented from
transporting even their own goods by road – a prohibition which was definitely con-
demned in Great Britain by the Royal Commission on Transport)* have paid railage
on the goods, and have then transported them by road rather than suffer the incon-
venience and loss of time involved in handing them over to the Railways. (This occurs
particularly over short distances in urban or industrial areas – where the old methods
of cartage and delivery of goods from and to railway stations are out of date).

In recent legislation in regard to Motor Transport, it has been entirely overlooked
that one of the most important economic services that can be rendered by motor
transport is increased convenience and speed in areas now served by the railways
alone. It is surely extraordinary that in certain industrial areas a large amount of goods
traffic has to be sent by rail, which it no longer economic to transport in this way.

Co-ordination of transport does not mean the stifling of new developments
because they impose on existing transport undertakings the need for change and
adaptation. As Major H.E. Crawford has expressed it in the memorandum pub-
lished on page 182 of the Final Report of the Royal Commission on Transport

* (Cf Final Report of the Royal Commission on Transport).
Para: 297: ‘Apart from the inconvenience and, in many cases, the economy of operating
his own transport the trader so doing has other advantages. For direct control; he gets
into direct contact with his customers; and he derives advertising value from his vehicles
(Q 4730). From the point of view of competition with other forms of transport whilst
some proportion of the traffic carried by these vehicles may have been abstracted from
rail or other form of transport, we think that in all probability the bulk of it is for local
delivery which in any case is unsuitable for any other mode of conveyance.
Para: 298: ‘We do not propose, however, to make any recommendations regarding the con-
rol or regulation of this particular type of transport which would interfere with its natural
development, since we believe that its future depends on its economic value to traders.’
There is a school of thought which finds the prospect or the final solution of all traffic problems in the creation of monopolies. Set up an ‘authority’ which means more people paid to tell others what they may and may not do. Prohibit competition and so protect the capital tied up in inefficiency. If people desire to travel above ground tell they must to the bowels of the earth, if it please you and would be too much trouble to create the services they desire. Stigmatise as “wasteful” the competition that you fear because it would thrive by giving people the services they ask for, and, having sheltered yourself from any attempt to dispute your monopoly, maintain prices at the level the public must then pay as the price of servitude. To do this is certainly to create uniformity, but it does not help people to get about or goods to be carried.

(24) The problem that has to be faced in South Africa now that a rigid railway monopoly exists, is how a very large and monopolistic transport undertaking can be given sufficient flexibility rapidly to adopt new and more economic transport methods. If this could be ensured one might be tempted to place under the control of one authority (e.g. the Railways and Harbours Company suggested earlier in this memorandum), not only the greater part of road transport, but also the responsibility for the building and financing of the roads necessary therefor.

There is, however, the danger that such a large monopolistic undertaking would fall behind the times in regard to transport development.

For the immediate future at any rate it is probably best that considerable freedom of enterprise should be given private undertakings to develop road transport services. This involves the drastic alteration of the basis on which licences for the carriage of goods are now granted. The obvious bias now existing in favour of the Railway Administration should be done away with. The proposed licencing measures recently adopted in Great Britain could perhaps with advantage be applied to South African conditions.

(25) It would appear advantageous that one central judicial body should in the final resort deal with Railway Rates and with Motor Carrier licences, and with railway charges and facilities, etc. This does not necessarily mean that local licencing authorities could not continue to exist, but the directing policy should be worked out by those with an intimate and expert knowledge of both Road Carrier and Railway, rates and conditions. Otherwise it is not clear how any co-ordination based on adequate economic considerations can be brought about. Moreover, it is only an absolutely impartial, judicial body that can hold the scales evenly between the Railway and Motor Carriers. At the least an appeal should lie from the Central Road Board to the Judicial Railway Rates Tribunal, and the latter should then have the same powers over the Central Road Board (and its policy) as over the Railway and Harbours Administration. In any case the Central Road Board should also contain a number of experts with experience of both Railway and Road transport affairs.
As things stand at present it would appear that the stimulus of competition is essential in South Africa if transport service as a whole is to be made more efficient – and such competition must be protected and regulated by a really impartial authority. At a later stage it may be possible to bring about a greater degree of actual consolidation of Road and Rail transport and this aim should be kept in view.

(26). If freedom to properly constituted private enterprise is given to engage in Road Motor Transport, the future management of the Railways and Harbours will no doubt bring about developments by which the Railways will be conditioned to carry out speedily and efficiently the functions for which they are suited, and will abandon that traffic to the road which it is right and economic, that the motor vehicle should bear. Moreover, large economies will be possible if the Railways continue to operate Motor services and if these are really integrated with the Railway system. The question that remains to be considered here is that of the construction, maintenance and financing of the roads that are necessary for this. It is in my opinion important that the Railways should be charged their proper proportion of the expenses of the roads upon which they operate motor vehicles. It might be possible that instead of taxation to be levied upon the Railways for this purpose, means might be devised, by which the roads bearing specially heavy motor vehicle traffic in conjunction with the Railway system, can be constructed and maintained by the Railway and Harbours Administration itself.

The general question of road construction should not be overlooked. It might be better to associate this work with that of the Road Boards (as recommended by the Road Motor Competition Commission) and they should be assisted by a general body, to plan a national road system, and to deal with the construction and maintenance of the same. It should not be impossible for Provincial authorities to consult with such an expert body in formulating their plans for road construction.

(27). In conclusion, I beg again to put forward the suggestion that a Ministry of Transport and Communication be set up, or at any rate, that the Minister of Railways and Harbours be advised by an Advisory Transportation Council. These bodies should control the general development of all forms of transportation and communication in South Africa, and should receive and publish adequate reports and accounts in regard thereto.

In this way, on the one hand, there will be made possible the independent and more flexible development of the various kinds of transport undertakings, which are necessary for the creation of adequate and cheap transport services / for the economy of the Union, and, on the other hand, the State will be assured of the necessary measure of control over it.

(Sgd) S. Herbert Frankel.
University of Witwatersrand
JOHANNESBURG.
November, 1933.
MW/

Report

ON THE

SIERRA LEONE GOVERNMENT RAILWAY

BY

LIEUTENANT-COLONEL F. D. HAMMOND. C.B.E., D.S.O..

Royal Engineers.

Published by

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[...]
CHAPTER II. – TRAFFIC DEPARTMENT.

4. In the estimates for 1922 an establishment of 1 Traffic Manager and 5 Assistant Traffic Superintendents is laid down, and this number was actually on the strength throughout 1921. The line was split up into three sections, Water Street, Boia and Bo, each in charge of an Assistant Traffic Superintendent; out of the remaining three officials two were on leave and the third acted as Traffic Manager. In April of this year it was decided to retrench two officials on grounds of economy, which left two in the colony, the Traffic Manager and one Assistant Traffic Superintendent stationed at Bo. An African Traffic Inspector acted as Assistant Traffic Superintendent in charge of the Boia Section. The Traffic Manager died at the end of July, so that, at the time of my arrival, there was only one European Traffic official in the colony; the senior Assistant Traffic Superintendent, who was on leave, was cabled for, and by the time I commenced the inspection of the department he had arrived and taken up duty as Acting Traffic Manager. The actual strength of European officials is therefore at the present time three.

The Assistant Traffic Superintendents, in addition to their duties in connection with operation, as explained later, have to deal with claims, enquiries, audit reports, and staff matters in their sections, and have offices and clerical staff for this purpose.

No night running is normally undertaken, no train being shown in the working time table as starting before 5.25 a.m. or arriving at its destination later than 8.9 p.m.

The maximum speed allowed is 25 miles per hour and in the case of the 101 class engine is limited to 15 miles per hour. The average speed of trains on which the working time table is based is approximately 15 miles per hour, being reduced to about 12 miles per hour on the Mountain section.

(A) Operation.

5. In the working time table certain goods trains are shown as fixed, and others as conditional. Each Thursday the Traffic Manager issues a train notice for the following week. All passenger and mixed as well as goods trains are shown on this list, but, naturally, can only be altered when the public time table itself
is changed, which of course occurs only at long intervals. But the goods portion of this notice has also become largely a matter of routine, and the same notice is published for many weeks on end, irrespective of the variations of the traffic. The definite ordering of trains is done by means of cancellations to the weekly train notice, and these are issued the day previous by telegram. These cancellations are issued for the Water Street section by the Traffic Manager and for the other sections by the Assistant Traffic Superintendent at Bo, but the latter also sometimes cancels down trains on the Water Street-Bo section. The information on which both base their cancellations is contained in the yard reports sent in daily in code. A yard census is taken at 7.0 a.m. by all stations; the results are telegraphed in code showing each truck by number in that station, whether empty, disposable or required, detained to be loaded or unloaded, loaded and requiring traction up or down, detained under load over twelve hours, under repair or detained for hot boxes, as well as the number of empties, if any, required in addition. The returns for the whole line are summarised and ready for the information of the Traffic Manager by 10.0 a.m. every morning. I examined the returns and satisfied myself that they were accurate and prompt. The Assistant Traffic Superintendents receive copies from all stations in their sections, and on these returns both they and the Traffic Manager base their cancellations of trains for the following day. The stationmasters decide generally by which trains the trucks are to be despatched, but the Traffic Manager or the Assistant Traffic Superintendents sometimes give special instructions regarding particularly important consignments or trucks to be picked up at intermediate stations. Stationmasters at intermediate stations have power to cut off trucks other than those containing perishables, if they have trucks at their stations of prior date to those on the train or containing perishables. This daily yard report gives the Traffic Manager an accurate idea of the truck situation on the whole line, and also enables him to trace the movement of any individual truck.

Its value is diminished for purposes of prompt action by the fact that it is received at 10 a.m. By that time most of the important trains have started, and so the cancellations and orders based on the report relate to the following day’s movements. Thus trucks which are marked as waiting for traction at 7.0 a.m. will not be moved until the following day, unless the stationmasters happen to be able to find room for them on trains the same day. No doubt they very often can find room, but equally there must be many occasions when they cannot. The system has the disadvantage of dividing the control of movements between the Assistant Traffic Superintendents and the Traffic Manager, and the exact division also is somewhat nebulous. It further entails the maintenance of office establishments for the Assistant Traffic Superintendents, as they have a large share in the control.
6. To obtain a clear idea of how efficiently trucks were being employed in actual practice, I had figures worked out to show the average number of days which elapsed between a truck being loaded at an up-country station and its arrival in Water Street, and I also had the work of several representative trucks tabulated to show how many trips they were doing per month. The process which I adopted was to divide the loading stations into five sections; the 1st section including stations up to and including Boia; the 2nd, stations on the main line beyond Boia up to Bo inclusive; the 3rd, all stations on the main line beyond Bo; the 4th, stations on the branch line up to and including Makump; and the 5th, stations on the branch line beyond Makump. In calculating the time taken for the journey the date of loading was not included; thus, if a truck was loaded on the 1st and arrived at Water Street on the 4th, it was noted as taking three days. On this basis the following table shows the time which trucks from each section should require, and the average time, Sundays excluded, which was taken in actual practice during the months of June, July and August, 1922:–

<table>
<thead>
<tr>
<th>Sections</th>
<th>1st Days 1</th>
<th>2nd Days 2</th>
<th>3rd Days 3</th>
<th>4th Days 2</th>
<th>5th Days 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time which should be taken</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Time actually taken –</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>1</td>
<td>2.7</td>
<td>4.1</td>
<td>3.9</td>
<td>3.6</td>
</tr>
<tr>
<td>July</td>
<td>2.2</td>
<td>2.6</td>
<td>4.1</td>
<td>2.6</td>
<td>4.1</td>
</tr>
<tr>
<td>August</td>
<td>2</td>
<td>2.8</td>
<td>3.5</td>
<td>3</td>
<td>3.7</td>
</tr>
</tbody>
</table>

This table shows that on the most important sections, the 3rd, 4th and 5th, the returns may be described as on the whole good, but capable of improvement.

The 3rd section, from which over half the trucks were despatched, is the best and shows a marked improvement in the August figures. On the other hand the figures for the number of trips per month were distinctly disappointing; these showed that, out of ten chosen cases, only in two were 3 round trips made per month, in two cases 2 trips and in the remaining six cases 1 or 1 1/2 trips were all that were obtained in a month of 31 days. Investigation of the actual journeys showed that, although the delays were in part on account of hotboxes, the majority were due to waiting loaded three, four or even five days at up-country stations for traction down, or empty at the Government wharf. These figures thus corroborate very clearly the criticism made earlier on the system of controlling movements. While the delays en route were few, both loaded and empty trucks were often allowed to lie at stations for long periods, sometimes for days together, at a time when, owing to the excessive numbers of hotboxes only two-thirds of the stock was in traffic and merchants were complaining of the shortage of wagons. Delays of this nature are the worst, because they cause more waste of truckage than all other causes put together. In this case it was evident that they were not being as closely watched as they should have been.
It is universally recognised that the movement of rolling stock can be controlled best by a central authority which can view the whole system as one; where control is divided, each section can only get a partial view of the picture. The Sierra Leone Railway handles very little more traffic and is very little bigger than the ordinary traffic district; there is therefore all the more reason for not splitting up the control. At the same time, owing to the Railway managing the telegraph system of the country, it has adequate telegraph facilities, and in its present yard reports has the nucleus of an excellent system which would entail very little, if any, more telegraphing than the present one.

7. I recommend that the whole ordering of trains and truck movements should be concentrated in the Traffic Manager’s office. The present system of weekly train notices should be continued, but these notices should be drawn up to comply more closely with what are likely to be the actual requirements. The Locomotive Department would then have a better guide for making their own forward arrangements. As all the commercial firms send to the Traffic Manager by Friday morning the numbers of trucks which they will require at each station the following week for loading kernels, he has an excellent basis on which to frame his programme. In addition, the Assistant Traffic Superintendents and station masters would forward details of other demands likely to be made. The Traffic Manager would send out his notices by Saturday morning, and they would reach the furthest point of the line by 2.30 p.m. on Monday, which would mean that the programme would have to begin on Tuesday morning and end on Monday night.

All stations would send in daily yard reports on the same lines as at present, but the hour of reporting would be noon instead of 7.0 a.m. These reports would show the trucks which will be loaded that day and ready for traction up or down the following morning, those which will be unloaded that day and disposable or required at the station and empties which will be required in addition. The remaining particulars would be similar to those now given. By noon the station-masters should be in a position to know what trucks will be loaded and unloaded that day and their requirements for the morrow. These returns could be summarised in time to allow the Traffic Manager to issue his train cancellations by 3.0 p.m.

Provided the weekly programme is drawn up with care the daily cancellations should be few. If in his telegram the Traffic Manager also showed the total number of trucks which each train was to pick up at intermediate stations, it would ensure room being left for these trucks on the trains and avoid delays. It would also be an advantage if sheds wired him early the engines available for traffic, so as to keep him advised of any alterations in the locomotive situation. With the present ample supply of locomotives and a closer weekly programme this need not be a daily wire, but sheds should notify well in advance cases where
they could not furnish locomotives for the trains notified in the programme. The abolition of the present telegram from sheds to the Chief Mechanical Engineer, giving departure time of trains, as recommended in the following chapter, would more than compensate for these extra telegrams sent from sheds to the Traffic Manager.

The Traffic Manager at the present time actually details trucks to trains in the daily yard report for his own information, although he wires no orders thereon to up-country stations, so that the only extra work thrown on his office would be the issue of the daily train wire.

A control of this nature would be both close and efficient, and would eradicate the present unnecessary delays to loaded and empty trucks. Instead of waiting until the day after trucks are loaded in order to report them ready to move, they would be reported the same day as they were being loaded, and definite arrangements made to move them the following morning. The same saving of time would be effected with wagons being off-loaded.

By amalgamating the Trains section of his office and the Movements section, two clerks could be saved. At the same time, the office of the Assistant Traffic Superintendent at Bo could be closed and that of the Assistant Traffic Superintendent at Boia reduced to one clerk. The whole of the work of controlling traffic would be centralised in the Traffic Manager’s office and the Assistant Traffic Superintendents would have no concern with it. Only one would be required outside Freetown, and he should be constantly on the line, inspecting, reporting to the Traffic Manager and keeping stations up to the mark. His headquarters would be nominally at Boia, but he should receive no returns, paysheets, etc., in fact, nothing which can keep him chained to his office stool.

The staff of 1st Class officials required is dealt with in a separate report.

8. The proportion of open wagons is high, being 242 out of a total of 384 goods vehicles. In the rainy season these require tarpaulins when loaded with palm kernels, because the jute bags used to hold the kernels rot if allowed to remain damp and the kernels themselves suffer if exposed for long. The stock of tarpaulins during the last rainy season was only 117 and some of these which had been purchased locally were too small to cover a truck completely. A further 40 had been cabled for, but could only arrive when the rains were nearly over. The Chamber of Commerce brought to my notice the loss which merchants were liable to suffer from this cause. I consider that their complaints were justified, and it is evident that His Excellency the Governor was of the same opinion, as he cabled for the additional forty mentioned above as soon as the matter was brought to his notice. With this addition the tarpaulins will number 157, as against 242 open wagons, and in certain cases two tarpaulins are required to cover one truck. The proportion of traffic which can be loaded without covering, including locomotive coal, is about 15 per cent. of the whole; as a rough
guide it may be taken, therefore, that tarpaulins are unnecessary for 58 wagons, which leaves 184 requiring them as against a stock of 157 tarpaulins. Forty will still be required to leave a margin for working purposes and for small tarpaulins, and I recommend this number being purchased in time for the next wet season. A small yearly provision will be required each subsequent year to make up loss from fire and deterioration. 

The tarpaulins should be controlled and distributed by the Central office in the same way as trucks. Any goods stock ordered in future years should also be of the covered type until the disproportion of open to covered wagons has been adjusted to the requirements of the traffic.

9. Although charges for demurrage appear to have been enforced in cases where they have been brought to light, in certain cases, noticeably on the Government wharf, merchants have been allowed through oversight and want of strict control at the head office, to retain trucks for seven, eight and even ten days, and use them for their own purposes, such as re-bagging kernels. This particular practice had been stopped before I arrived, but its existence was a sign of the small importance attached to delays during loading and off-loading, which, on the contrary, are the very points which require the closest watch.

10. The yards at all the principal centres, including Cline Town, suffice for the traffic to be handled. The one exception is Water Street. The layout of the whole station, both passenger and goods, is very cramped, awkward and primitive, and although the main goods shed for the receipt and despatch of general goods is commodious and could handle a far bigger traffic than it has ever yet experienced, the shed for wagon loads and special goods consignments is distinctly cramped. Any alteration or improvement, however, would be very expensive, not only on account of the nature of the adjoining ground, but also on account of its high price.

Despite its disadvantages, the yard, layout and sheds are capable of handling, and did handle, in fact, in 1913, a traffic considerably larger than has ever passed since, and therefore any extension at present could not be justified. When trade once again approaches these figures it will be time enough to contemplate alterations, and by that time also the financial situation should be more healthy.

The present working of the yards could be improved, if the shunting was placed on a more systematic basis. This also applies to shunting at the Government wharf. A programme should be laid down for use when coal is not being delivered in bulk. Wagons for the wharf have to be cleared by consignees at Water Street, and this is usually done in the case of wagons arriving in the evening by 8.0 a.m. the following day. The programme should aim at getting these to the wharf by 9.30 a.m.; this would leave the whole day for their off-loading and at the same time prevent congestion at Water Street. The second aim of the wharf programme should be to clear all empties from the wharf the last thing at night,
so that they are ready for despatch up-country next morning. In several cases I noticed that empties had remained all night at the wharf, and so lost a day. When coal is arriving this programme would have to be suspended because the steepness of the gradient on the wharf line limits the load to three trucks, and all other considerations have to be subordinated to keeping up a steady flow to and from the wharf. With this exception, a fixed time table for the use of the shunting engine would induce more regular working and get a better use out of the yards.

11. A noteworthy feature of the department is the absence of statistics; the weekly allocation of trucks for palm kernel traffic, and the monthly return of hotboxes are the only statistics kept regarding its work. This is remarkable, as an operating department is essentially the one which should want to know early exactly what work it has performed, what variations there are in the traffic and how it is progressing. On the other hand, the Accounts Department, which is only remotely interested in operating, keeps full statistics concerning ton-miles, tonnage, / commoditities carried, tonnage despatched from each station, analysis of passenger mileage and station summaries of passenger traffic. These records are compiled annually for the report and are available too late to be of practical use for operating. They possess a certain value in so far as they give a general view of the results of the past year, but are useless as regards helping the Traffic Department to keep in close touch with traffic movements and operation.

The chief object of operating statistics is to enable the work of the Railway to be carried out more efficiently; it is therefore preferable that they should be compiled by the operating departments who are going to use them. It is to their interests to get them out promptly and in the form which will be of most use. I am therefore recommending in Chapter VI. on the Accounts Department that the whole of the statistical work now carried out in that department should be discontinued; instead, the Traffic Department should be responsible for preparing such as are essential for efficient operating and are not prepared at present by the Locomotive Department.

To obtain passenger statistics a copy of the Daily Record of Passenger Traffic should be sent from each station to the head Traffic office. This daily record will under the simplified system of accounting proposed in para. 19 be forwarded daily from all stations to the Accounts Department; this proposal regarding its use for statistics will only entail the taking of an extra carbon copy for use in the Traffic office. These forms will be there abstracted and summarised to arrive at the figures regarding the number of passengers and revenue. Forms similar to those now in use in the Accounts Department can be employed for the purpose. These results can without difficulty be got ready by the 6th of the following month. The figures for passenger mileage need only be worked out annually, as they are not required so promptly, provided the figures for the numbers of passengers and revenue are available in good time. Their compilation monthly also
means considerable additional work. Tonnage, ton-mileage and revenue statistics can be similarly compiled by the Traffic office from a copy of the Daily Record of Station Transactions prepared under the proposed new system of station accounting. This also should be ready by the 6th of the following month.

Statistics regarding commodities can be obtained most easily by making each station forward at the end of the month an abstract showing the principal commodities received and despatched. This would be much simpler for stations to compile than the present abstract, which forms part of the monthly station accounts, and so would be well within their capabilities. Statistics could thus be obtained not only regarding points of despatch, but also points of receipt. At present, the former only are given, and, although useful for export traffic, they are useless for import traffic like salt, for which the station of receipt is the matter of principal interest. The principal commodities are now divided up under 17 heads, and I do not recommend any increase in this number, as it is useless to maintain figures respecting a large number of unimportant traffics.

Train-mileage, engine-mileage and vehicle-mileage are already worked out by the Locomotive Department and therefore it is unnecessary for the Traffic to keep parallel figures. The Locomotive Department, however, should have them ready and forward them to the Traffic Department by the 10th of the following month, and not six weeks later as at present. This is referred to in para. 51, Chapter III.

For this statistical work not more than three clerks will be required in the Traffic Department, a saving of three clerks on the total of six / now employed in the Accounts Department on this work. The statistics branch of the Accounts Department could then be closed and the three best men transferred to the Traffic Department.

12. The journals prepared by the guards are very simple, and contain no detailed information regarding truck numbers, load of trucks or tare. As, however, they will not be used as a basis for statistics under the system outlined above, I am not proposing any alteration. The journals for down trains into Water Street are handed into the Traffic office; those for up trains into Bo, and those for all trains between Bo and Pendembu and on the Kamabai branch are sent into the Assistant Traffic Superintendent’s office at Bo. In theory, the former category are inspected in the Traffic Manager’s office, and the latter in the Assistant Traffic Superintendent’s office, after which they are forwarded to the Traffic Manager. In practice, the inspection appears to have become rather slack; with the centralisation of the control of traffic in the head office, all guards’ journals should be forwarded there by stationmasters at depot stations, and a closer inspection should be instituted.

Telegraphs.

Guards’ Journals.
13. The operation of all telegraphs in the country, except those belonging to the military, is in the hands of the Railway. Practically the whole of the telegraph lines run along the railway; the exceptions are the line from Mano to Sambuya, from which point a line goes to Pujehun and another to Bendu. At the latter place a ferry is maintained by the Railway to convey telegrams to and from Bonthe on Sherbro Island. The station staff act also as telegraph clerks. The Railway benefits considerably by acting in this dual capacity, not only from the monetary point of view, but also because the amount of telegraph traffic passing necessitates a larger number of wires than the Railway would require for its own work alone, and so it has at its command a better system of communication. The Colony as well as the Railway benefits from the saving in staff. With a system widely extended to places off the line it might not be feasible to leave the Railway in complete control, but it is well adapted to conditions likely to exist for the next few years. The results appear to give satisfaction; I received no complaints and the errors are not numerous. The trading community at Bonthe put in a request for either a submarine cable to connect Sherbro Island with the main land, or a small wireless installation to do away with the delays due to the ferry, but the small traffic passing would not justify the adoption of either of these expensive remedies.

14. Traffic is passed by means of the Webb-Thomson electric staff instrument, and in case of failure by line clear messages despatched by telegraph or telephone. The arrangements are normal and call for no comment, except that the regulations are not sufficiently clear as regards the responsibility for giving and taking staff at stations where there are stationmasters and assistant stationmasters on duty at the same time. It should be clearly laid down that the stationmaster while on duty is the only person who is allowed to give and take staff, and when going off duty he should definitely hand over the duty to the assistant stationmaster. For Water Street station the duty should only be performed by the assistant stationmaster on duty and no one else.

15. It is not at present obligatory for stationmasters to know telegraphy. All recruits for the Traffic Department are now being drawn from the Traffic School, where telegraphy is one of the subjects, but some candidates who have not qualified in it are being passed out from the school. I think, therefore, that it should be laid down that in the future no one will be promoted to the rank of stationmaster unless / qualified in telegraphy. It would be of advantage also to encourage those who have already attained that rank to make themselves proficient and in their case I recommend the grant of a special allowance of 10/- a month to stationmasters now holding the rank who are either qualified or qualify in the future. Further economies should result from this as it will enable a reduction to be made in the number of telegraph clerks at smaller stations.
16. Another direction in which economy and greater freedom in movement of staff could be effected would be by amalgamating the telegraph and station clerks and calling them all station clerks. They should all have a full knowledge both of telegraphy and station accounting. Most of them now have both qualifications, and the rule should be made a general one.

17. Three native detectives are employed; their identity is well known to the staff and the public. If the present ones were changed the new ones would be equally well known in a short time. So far they have achieved no results whatever on their own initiative, and I do not think they have saved the Railway any appreciable amount by their presence. I therefore recommend their retrenchment, and, whenever in the future the Railway requires a detective for special work, application should be made to the Police Department.

(B) Consignment of Goods and Station Accounting.

18. The method of consigning goods is generally similar to that in use on the Uganda and the Gold Coast Railways, but has some local variations. The consignor presents a consignment note on forms provided by the Railway, different forms being in use for consignments at Railway Risk and Owner’s Risk. The counter clerk weighs the consignment and enters the weight on the note. The consignor then takes this to the invoice clerk, who enters up details as to rate and freight charges, and the consignor takes it to the cashier and pays the charges. He then brings it back again to the invoice clerk, who makes out the invoice. This is in triplicate with a receipt form attached. The original accompanies the goods to destination, the receipt slip being torn off and handed to the consignor, the second is sent intact to the Traffic Audit, and the third, also intact, is retained in the book. The goods are handed over to the consignor at the receiving station on his presenting the receipt slip given to the consignor. The receipt slip is then attached to the copy of the invoice which has accompanied the goods and both are retained at the receiving station.

The disadvantages of this system of a separate invoice for every consignment from one consignor to one consignee I have described at full length in previous reports. Put briefly, it delays consignors and requires a large expenditure of stationery. In case of small consignments of general goods, the guard has a mass of papers to carry, sort out, and deliver. Where the whole operation of consigning and paying takes place in the goods shed, it congests the sheds and gives opportunities for pilferage. Also, owing to the clerk having to make out the invoice while the consignor is waiting, there is more liability of mistakes in copying owing to his being hurried. To take its place I recommend the method of duplicate consignment notes presented by the consignor. Both copies are completed
as to weights, rate and freight charges by the station clerk, who, on receipt of the money from the consignor, hands him one copy of the consignment note signed as his receipt. / 

The presence of the consignor is no longer necessary, and he can go; he is thus dealt with and his business dispatched quickly. His copy of the consignment note must be handed over by the consignee at the receiving station before he can obtain delivery of the goods.

The station copy of the consignment note is then passed to the invoicing clerk, who enters it on the invoice, only one invoice being required for all consignments from any one station to any other station instead of a separate invoice for practically every consignment. Each invoice is in triplicate, the original being despatched with the goods, the duplicate sent to the Traffic Audit and the triplicate retained in the book with the various consignment notes relating to it attached. The receiving station attaches the copies of the consignment notes handed over by the consignees to the copy of the invoice which has accompanied the goods and retains them for audit purposes. I have discussed this proposal with the Traffic and Accounts Departments, and I understand that both agree that it would be an improvement on the existing method, and more economical. I am of opinion also that by adopting this system and that of daily station accounting described in the following paragraph, considerable reduction could be effected in station staff; for instance, at Water Street two invoice clerks at the most would be required instead of three as at present. The total number of staff which could be retrenched by the adoption of this system is included in those given in paragraph 20.

19. The system of station accounting in force is similar to that in use in England. Each station compiles monthly abstracts of invoices to every other station, the abstracts being in turn summarised and the results carried to a monthly goods balance sheet. In addition to these requirements of the English system, each despatching station sends in daily as described in the preceding paragraph, copies of all invoices for checking as regards undercharges and overcharges. Goods traffic from flag stations where there is no resident staff is handled on what is known on English railways as the ‘Weigh, charge and advise’ system.

Passenger takings and tickets are also accounted for on the English system with a monthly coaching classification showing commencing and closing numbers of all descriptions of tickets, revenue collected from each and all relevant details, which are in turn brought to a monthly coaching balance sheet. In addition each station sends in a daily ticket statement.
The railway regulations lay down that all traffic, except live stock, to Freetown will only be accepted for conveyance ‘freight to pay,’ and that all other traffic must be prepaid. Livestock and goods traffic on the Mountain section must in all cases be prepaid. The presence of ‘to pay’ traffic of itself necessitates the maintenance of elaborate station accounts on the English system. If it were abolished, a much simpler method could be adopted. The regulation insisting on all goods traffic to Freetown being ‘to pay’ dates from the early days of the Railway and the motive underlying its introduction was to prevent the collection of large sums at up-country stations. This, however, was before banking facilities were available up-country, or credit vouchers for firms were instituted. On the Gold Coast Railways all traffic, without exception, is prepaid, the same system being in force as on the Sierra Leone Railway for accepting credit vouchers from firms of standing who are backed by a bank guarantee, accounts being settled weekly. These credit vouchers are treated by the stations despatching the traffic as cash in their accounts. In consequence of this elimination of ‘to pay’ traffic the Gold Coast Railways have been able to introduce a very simple system of station accounting based on a daily in lieu of a monthly balance. Under this system, each station compiles daily a record of station transactions on which are entered in detail all goods parcels and excess fare transactions and to which are attached the necessary documents in support, such as the audit copies of all invoices. Stations only render accounts of traffic despatched not of that received. For coaching traffic a record of passenger traffic is compiled daily showing the commencing and closing numbers of tickets, number issued, rate, amount; a statement in fact very similar to the daily ticket statement now in use on the Sierra Leone Railway. On the record of station transactions is a pro formâ balance sheet to which are carried the results of the records of passenger traffic and station transactions, and a cash remittance statement. If necessary, this balance sheet can be on a separate form. In this way each station balances its accounts daily, the accounts are far simpler, and less liable to errors, any error made is discovered at once by the Traffic Audit Branch, and the station advised instead of having to wait until the end of the month. Instead of the accounts of a large station like Water Street not being ready until the 20th of the following month, they would come in daily and be up to date; this again facilitates the handing over of station accounts at short notice between the outgoing and incoming stationmasters. The outstandings in station accounts would be negligible, and finally and of the most importance, station staffs can be materially reduced owing to the simpler nature of the accounts, the few
forms which have to be compiled, and the fact that the accounting work is spread out evenly over the whole month.

Both the Acting Traffic Manager and the Chief Accountant agree as to the advantages to be obtained from introducing the system.

The introduction of this system necessitates, however, the total abolition of ‘to pay’ traffic. Conditions of traffic on the Gold Coast are very similar to those in Sierra Leone, and I am unable to see any particular condition existing in the latter which would militate against the success of a system which has achieved such admirable results in the other colony.

As the question is one which affects the commercial community I discussed it with the Chamber of Commerce at Freetown. As a result of this discussion, the Chamber has informed me that its members are in entire agreement with my views on the question. I have therefore no hesitation in recommending most strongly that ‘to pay’ traffic should be abolished, and the Gold Coast Railway system of daily station accounting introduced both for coaching and goods.

It will probably be necessary to discontinue the acceptance of goods consignments at flag stations; this only amounts to about £200 a year in all, and as the carry to the nearest station is never long, practically the whole of it would still come to the Railway. Maconkary is the only flag station at which it would be necessary to have a station staff, and as this need only consist of one clerk the additional expenditure would only be at the most £60 a year, as opposed to very large savings which would result in other stations in consequence of the adoption of the scheme.

20. I am of opinion that the following reductions could be made in the station staff; these reductions include those which would result from adopting the simpler methods of consignment and station accounting recommended in the previous paragraph: – /
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The watchmen are used for guarding loaded trucks left over night in stations; at stations named these cases are not frequent, and could be met by hiring watchmen when required.

The adoption of the above recommendations will thus give a saving of 1 stationmaster, 33 clerks, 9 porters, 14 watchmen, 2 trolley boys and 2 messengers, or, assuming the clerks as being all on the £60 a year scale, an annual saving of £2,500.

Certain of these retrenchments could be introduced without waiting for the introduction of centralised control or the new forms of consignment and station accounting. This applies to the closing of Mamunta Station, the retrenchment of approximately 6 of the clerks at up-country stations, and of all the porters, watchmen and trolley boys mentioned. Before leaving the country I made an interim report to His Excellency the Governor detailing these cases, so that no delay need occur in taking action.

(c) Rates for Goods Traffic.

Rates in force. 21. The goods tariff includes five classification rates: –

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<th>Rate per Ton-mile.</th>
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These rates are at a uniform rate per ton-mile throughout, and are at owner’s risk. Where goods are despatched at railway risk 10 per cent. is added to the above figures. In the case of rice and ginger the particular class rate is at railway risk, the owner’s risk rate is 10 per cent. less.

Firewood from beyond Mabang, mile 40, to Water Street is charged one-half third class rate.

A rebate of 5 per cent. is made on full wagonloads of all goods carried on classification rates.

Special rates are quoted for native food stuffs, palm kernels and palm oil. These are zone rates, i.e., the charge from any station within a certain zone to any station within another prescribed zone is at a fixed rate per ton. Railway risk rates are quoted on the two last named at 10 per cent. above special rates.

22. Palm kernels provide over half the goods revenue and more than one-third of the total revenue of the Railway from all sources, excluding telegraphs and telephones. It is by a long way the most important traffic. The present zone rate was introduced in 1915 in place of the uniform ton-mile rate of 2 3/4d.
which was in force previously. Although the new rate was on the whole slightly higher than the old one, especially at stations which happened to be at the end of the zone closest to Freetown, the actual revenue received per ton hauled under the old rate was, owing to various factors, very slightly higher than that received under the new rate. From the point of longest haul, Pendembu, 228 miles, the freight per ton is now 55s. as against 52s. 3d. formerly. This station also handles the largest tonnage of kernels, and so it will be seen that they are being carried at practically the same rate as before the war.

The average price for kernels in Freetown from January to August, 1922, was £12 a ton; it changed later to £10 10s., but the former is the fairer figure as considerable buying was then taking place. The average price in Freetown for the period, January to June, 1914, was £16 a ton. For the same periods the market prices in London were £20 and £18 in 1914 and 1922 respectively, and there is an export duty of £1 a ton now, whereas there was none before the war.

With the price of the commodity in London actually lower than it was before the war, there can be no justification for raising the railway rate. A temporary rise might have been justified during the boom period, but it would undoubtedly have a most serious effect on the trade at present, and lead to a shrinkage in revenue. It can be argued, of course, that if the export duty of £1 per ton were removed, the rate could be raised, but a very large proportion of the kernels exported from the country do not pass over the railway, and the Government naturally prefer a charge which can be levied on the whole of the product and not only on a portion. At the same time, I do not recommend any lowering of the existing rate. The present tendency of all raw commodities is to find a level somewhere in the neighbourhood of, though in general slightly above, the pre-war figures. Kernels have actually gone below the old level, but this is probably temporary and dependent on the adverse exchanges of Central Europe restricting its buying capacity.

The rates before the war enabled a profit of £78,263 to be made on the Revenue Account for 1913. From this loan charges of approximately £52,000 had to be found, as well as any sum required to carry out renewals or extraordinary expenditure. Together these absorbed considerably more than the profit on the revenue account, and 1913 was the best year that the Railway has ever experienced. Consequently, the rate for kernels which provided more than half the revenue, and on which the whole prosperity of the line depended, cannot be regarded as returning too high a profit.

The comparison with the rates now in force on other West African Railways, as given in the table below, shows also that the Sierra Leone rate is lower than its neighbours. I have chosen Mano, mile 107, and Pendembu, mile 228, as the points of despatch, as the former is the nearest point to the coast with any large traffic in kernels and the latter is the longest haul.
Kola Nuts. 23. The next most important export as regards revenue is kola nuts. Prior to 1915 a uniform rate of 7 1/2d. a ton-mile was in force. In the 1915 tariff they were placed in Class B with a uniform rate of 10d. a ton-mile, an increase of one-third. In addition to this there is an export duty of £4 13s. 4d. a ton, and the French colonies, to whom a very large portion of the crop goes, have recently imposed an import tax. Despite these disadvantages and the drop in the price, the traffic on the Railway and the export from the Colony have shown no sign as yet of falling off. Thus, while in 1913 only 661 tons were carried, in 1921 1,568 tons were handled by the Railway, the highest return in its history with the exception of 1919. In the first eight months of 1922 1,392 tons were carried. This trade has thus not only increased considerably since 1913, but was still flourishing up till August of this year, despite the increased charges, and the only inference to be drawn is that the kola merchants in the past must have made very large profits indeed. At the same time although I do not recommend any change at the present moment, the situation is one which requires careful watching, because the full effect of the French import tax may not have made itself felt yet.

If eventually it turns out that this is having a harmful effect, I would submit that it should be met by a reduction in the export tax rather than in the railway rate, because the relief will then be felt by all growers, and not only by those served by the Railway. Also the tax makes a greater charge than the highest railway rate, i.e., that from Pendembu, and therefore there is scope for reduction.

Palm oil. 24. The export traffic which ranks next after kola nuts is palm oil, but its relative importance as compared with palm kernels is shown by the fact that the revenue obtained from it seldom exceeds one-twentieth of that from kernels. Before the war the rate was actually less than that for kernels, although the value per ton of the oil was double that of the kernels. This was adjusted in the 1915 tariff, the palm oil rate being doubled. The rates to Freetown in force at present are 87s. 4d. a ton from all stations, Pendembu, mile 228, to Gerihun, mile 149, inclusive, to Freetown, and 78s. a ton from all stations, Bo, mile 136, to Mano, mile 107, inclusive, to Freetown. This trade is an erratic one, and although the tonnage carried in 1921 was only 611 tons, the lowest on record for many years, this is not attributable to the rate. This is proved by the fact that the tonnage carried during the first eight months of 1922 was 1,431 tons, which averages higher
than any previous year. It is not, like kernels, the principal source of the native’s revenue, and in view of the excellent returns for 1922 there appears no case to reduce the rate, nor does it appear probable that any increase in revenue would result from a reduction.

25. The only other country products which are produced in sufficient quantities to require notice are rice and ginger. These are both carried at owner’s risk on Class 3 rate of 3 1/2d. per ton-mile, less 10 per cent., and enjoying the same rebate as other classification items of 5 per cent. on full wagon loads. Until this year the rebate in force on full wagon loads was 25 per cent. Whilst a 25 per cent. rebate appears to me to be too high, on the other hand 5 per cent. is hardly adequate compensation in the case of country products for the advantage which the Railway gets in having to deal with wagon loads loaded and offloaded by the owner. I would recommend a rebate of 10 per cent. for wagon loads in the case of these two particular items.

26. Turning to the question of imports, the most important of these is salt.

Proposals have been made at various times to increase the present charge of 3 1/2d. per ton-mile, third-class rate at owner’s risk. On reference to former administration reports it will be seen that, taking one year with another, there has been a steady increase, a greater proportionate increase in fact than has taken place in the total imports into the country. Even the returns for 1921, which was an exceptionally bad year, were very little short of those for 1913, and those for the first eight months of 1922 averaged 308 tons a month, which will, if continued for the rest of the year, give a total which will rank second only to that of the record year of 1920.

Salt is a low-priced commodity, and the railway freight forms a high proportion of the total cost. It is consequently very susceptible to any change in rates. To raise the rate at a time like the present, when markets are depressed, and the purchasing power of the native low will certainly mean a loss in revenue. If it is lowered, on the other hand, it is unlikely that any reduction which it is within the scope of the Railway to give would, in view of the import tax, bring in sufficient additional consumers to compensate for the loss on the present tonnage. The steady increase in tonnage which is taking place is a satisfactory sign and shews that, on the whole, the rate is an equitable one. Under these conditions it would be unwise to tamper with it.

27. The table below shews the rates for the principal imported commodities on various railways in Africa. The distances of 107 and 228 miles are chosen, as they represent the first station on the Sierra Leone Railway with a considerable traffic and the station with the longest haul.
Comparisons of this nature are not an infallible guide, owing to the differing conditions in each country and differences in prices and purchasing power. They serve, however, in this case to shew that the rates on the Sierra Leone Railway compare favourably on the whole with other African colonial railways.

28. A striking feature of the classification rates under which all imports, including salt, are booked, is that they are on a uniform rate per ton-mile throughout, irrespective of the length of haul. This is in opposition to the universal practice of tapering the rates, so that the rate per ton-mile over a long haul is less than over a short one. Goods hauled only a short distance can stand a much higher rate per ton-mile than when carried several hundred miles. In the case of the Sierra Leone Railway the maximum haul is only 228 miles; against this the average haul is 133 miles, shewing that the bulk of the traffic has a very long haul, considering the shortness of the line. The table above shews that the rates over the longest haul are not unreasonable. Any adjustment with the object of introducing a taper must therefore be effected by raising the rate per ton-mile for the shorter hauls. This, however, would bring in little extra revenue, as such a small proportion of the traffic is shorthauled. On the other hand, the introduction of tapering rates would mean the preparation of a new tariff book; to compile, print and issue this would probably absorb the whole of the extra revenue gained in the first year or two, especially as additional European staff would be required. The present tariff book is badly arranged, and full of amendments; a new one will in any event have to be issued as soon as funds permit. The wiser
course is therefore to continue the present tariff book and system of rates for a year or two until the financial situation is improved, and then have a thorough revision of the book and introduce a system of tapering rates at the same time.

29. It would be advisable, however, to amend at once the clauses in the conditions of carriage relating to articles of value; those now in force mix up with articles of high value dangerous goods for which special rates and conditions are imposed, and also all goods consigned at special low rates, and generally leave the liability of the Railway as regards the first-named ill-defined. I recommend that the Law Officers of the Crown should be requested to prepare suitable clauses to be brought into force by legislation.

30. Two rates in particular to which my attention was drawn by the Chamber of Commerce where those on spirits and returned empty barrels. On July 1st of this year spirits, wine and beer were placed in Class Special ‘A’ instead of Special ‘B’ as formerly, thus raising the owner’s risk rate from 10d. to 1s.8d. a ton-mile. The freight from Freetown to Pendembu then became 380s. instead of 190s. a ton. The actual increase per bottle amounted to 4 1/4d. at Pendembu. On an article costing at the coast in the case of gin 6s. 8d. a bottle, and in the case of whiskey 9s., an increase of 4 1/4d. will have no serious deterrent effect on sales. Spirits are not what might be called a delicate trade, liable to be upset by a small rise of this nature. It is extremely unlikely that there will be any diminution in the traffic and the Railway will benefit accordingly.

On the other hand the increase per bottle in the case of beer worked out at the same figure. An increase of 4 1/4d. in the case of an article costing 1s. 4d. makes a considerable difference, and will very probably affect the sales to such an extent as to cause a loss in revenue. For these reasons I recommended to His Excellency the Governor that spirits and wines (the sales of the latter are negligible) should be retained in Class Special ‘A,’ but that beer should be restored to Class Special ‘B.’

31. In the case of empty butts, barrels and puncheons, which are used principally for the palm oil traffic, the Chamber of Commerce asked that these be returned free of charge to up-country loading stations. They are at present placed in Class I traffic, thus costing 133s. per ton from Freetown to Pendembu. This traffic is light and bulky, and is therefore one which is not regarded with very favourable eyes by railways. Such a rate as 133s. on the other hand adds considerably to the cost of production of palm oil; in fact it adds on to the cost at the coast a sum equal to one-third of the freight on the oil from loading stations upcountry into Freetown. The excess of down over up traffic means that trucks have to go up empty, and so the cost to the Railway of carrying the empty barrels is small. Whilst I do not think there is sufficient reason for carrying them entirely free of charge, I am of opinion that the present rate is hardly justified, and recommend this item being transferred from Class I to Class II, which will
mean 90s. per ton instead of 133s. from Freetown to Pendembu. Similarly, I consider that shooks and barrel staves should be transferred from Class II to Class III because they form a better load for the Railway, and, as the merchant has to go to the expense of coopering, it is only fair that he should profit by a lower rate than in the case of barrels.

These recommendations have been put before His Excellency the Governor.

32. It will thus be seen that with a few exceptions I am recommending the maintenance of the existing rates. At the present time when markets are struggling to surmount the prevalent depression, and the purchasing power of the native is very low, any increases in rates are liable to have serious effects.

On the other hand there appears to be no individual traffic in which a reduction of the rate would lead to any considerable increase of revenue and the financial situation of the Railway does not justify reductions which have not got a reasonable prospect of showing a profit.

(D) Passenger service and fares.

33. The passenger service on the main line consists of a passenger train three times a week between Water Street and Pendembu and return, stopping the night at Bo on both the forward and return journeys. A mixed train runs three times a week from Water Street to Boia, returning on the following day to Water Street, the up-journey being made on the alternate days to those on which the up passenger train runs. The down mixed train from Boia similarly runs on alternate days to the down passenger train so that there is a daily service between Water Street and Boia. This train continues to Moyamba on Thursdays, and also starts from Moyamba instead of Boia on Mondays.

From Waterloo, a residential district, a train starts daily at 6.25 a.m. for Water Street, returning at 4.35 p.m. except on Saturdays, when it leaves earlier. Between Kissy, a town five miles from Water Street, where many of the African employees of the Government and the commercial firms reside, a special service of two trains a day each way is run in addition to the services quoted above. The first leaves Water Street at 10.35 a.m., runs out to Kissy and returns to Water Street, arriving there at 12.8 p.m.; the second leaves Water Street at 3.45 p.m., reaches Kissy at 4.15 p.m. and Water Street on the return journey at 4.48 p.m. Finally there is a local service of 7 trains a day each way between Cline Town and Water Street so that there is actually a service of 11 trains a day each way between these two stations.

The Mountain section service and fares are reviewed separately in Chapter VII.
34. In February, 1920, the fares for the main and branch line trains were raised respectively to 4 1/2d. a mile for first class, 2 1/4d. a mile for second class and 1 1/2d. a mile for third class passengers.

In June, 1922, it became clear that the very high third class fares in force on the main and branch lines were having a detrimental effect, and that the people who previously travelled were losing the habit.

His Excellency the Governor consequently decided to reduce it from 1 1/2d. to 1d. a mile with effect from July 1st, 1922. The soundness of this decision is emphasised in a very marked manner by the following table which gives the number of third class public passengers and the total revenue from that source for the months of June, July, August and September, 1922. Return tickets are counted as two journeys.

<table>
<thead>
<tr>
<th>Month</th>
<th>Number of Passengers</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>29,721</td>
<td>£1,740 Before Reduction.</td>
</tr>
<tr>
<td>July</td>
<td>37,808</td>
<td>£1,921 After Reduction.</td>
</tr>
<tr>
<td>August</td>
<td>40,352</td>
<td>£2,205 do.</td>
</tr>
<tr>
<td>September</td>
<td>40,564</td>
<td>£2,017 do. /</td>
</tr>
</tbody>
</table>

It is possible that the October returns will show a decrease on the figures for June, when the old tariff was in force, but too much attention should not be paid to this. The collection of the rice harvest coupled with the temporary slump in the kernel trade will be the principal factors in this, and a heavier loss would probably have occurred if the rate had been maintained at the higher figure.

35. The introduction of a penny a mile fare brings back the third class rate to the same figure as before the war. The success attendant upon this reduction at once raises the question as to whether the present rate is that best suited to the economic requirements of the country, and therefore the one which is likely to bring in the best return to the Railway. The average native up-country seldom earns more than 6d., 7d. or at the most 9d. a day. The earnings of the majority certainly do not exceed 7d. For this sum at the present the Railway will only carry him and his load of 56 lbs. for 7 miles, whereas he can walk and carry his load 12 miles at least in the day. Thus, for a journey of 84 miles he has to pay to the Railway twelve days’ pay, but can walk it in seven days; the same holds, though in a lesser degree, for the man earning 9d. a day. It is obviously an unsound business proposition for this man to use the Railway. He actually loses money by doing so. The speed of his journey does not compensate for the money he has to pay in order to travel so fast. This class of man also is accustomed to walking long distances and, as time is not the same object as in more civilised countries, there is obviously no inducement to him to travel by rail; in fact the reverse is the case.

The result is that even with the reduced fares the bulk of the population not only cannot afford to travel by railway, but would in fact lose money if they
were to do so. The fact that they do not use the railway was corroborated by the enquiries I made on the spot.

Comparing the rates with those in force in England, an agricultural labourer earns about 5/- a day, for which he can travel 34 miles at present, and when the reductions are made on January 1st, 40 miles. There are many workmen’s fares which are still lower. The agricultural labourer is the lowest paid grade in England, and yet it obviously pays him to go by train rather than walk. He is also quite unaccustomed to walking long distances, and time is an important object.

From the railway point of view it must be remembered that the first aim of any railway undertaking should be to increase its gross revenue. Over 60 per cent. of the expenses are fixed and quite independent of the number of trains run. It is therefore more true of a railway than of any other business concern that its principal object should be to increase its gross takings. This is especially true of the Sierra Leone Railway at the present time, because it has engines and drivers in excess of its requirements of the moment, and the only additional expense of running extra trains would be the cost of coal and oil, a small additional sum for locomotive and wagon repairs, and perhaps a small addition to the wages bill. Finally, as shewn later, the only expense in the matter of rolling stock would be the fitting up of four coaches with lavatory and automatic brake fittings at a cost not exceeding £200. Even, however, if the purchase of new rolling stock had been necessary, it would have been sound policy to incur the expense.

It may be argued that the gross revenue would not be increased, because to do so would mean at least doubling the present number of third class passengers, but the very fact that the bulk of the population living along the railway never use it at all shows that there is every possibility of not only doubling, but trebling the number of third class passengers. It is true that to start with these results will probably not be achieved, because this class has got to get accustomed to using the railway, which will take a little time; it is important, therefore, that the result of any reduction should not only be judged by the results of the first few months; it must be allowed time in which to develop its effect.

Besides the opportunity of increasing the gross revenue, the Railway stands to gain by the increased trade, which is the necessary consequence of increased travelling as has been demonstrated beyond dispute in many countries. With a native population also the opportunities for travel create new wants and these again create more trade.

In conclusion it may be said that so long as the railway fares are so high that the bulk of the population will lose money by travelling by train as compared with walking, the Railway is not meeting the economic requirements of the country, and is not fulfilling its purpose either from the business or the social point of view.
I therefore strongly recommend that the third class fares should be reduced to 1/2d. a mile; at that figure it will just pay a man earning 6d. a day to travel; at any higher rate such as 3/4d. it will not pay any man earning under 9d. a day. I am laying all the more stress on this reduction because the opportunity which it gives of inducing an entirely new class, who never did so before, to use the railway appears to me, after close study, the only means of obtaining a substantial increase in the gross revenue of the Railway. The principal goods traffics, kernels, palm oil and kola, will no doubt show gradual increases, but no sudden rise can be expected. Cocoa and sisal may in the future give good profits, but not for some years to come. By inducing the bulk of the population to travel not only will they add to the revenue, but the wants and demands thus created will induce them to pick and bring to market the large stocks of kernels hitherto untapped.

36. Before discussing the modifications which this will necessitate in the time table it would be advisable to consider the first and second class fares and revenue.

The following table shows the numbers of passengers and total revenue from each class for the months of July, August, and September (excluding Government traffic). In this table the return tickets are counted as two journeys.

<table>
<thead>
<tr>
<th>Class</th>
<th>Number of Passengers</th>
<th>Per cent. of Total</th>
<th>Revenue</th>
<th>Per cent. of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>1st</td>
<td>7,106</td>
<td>15</td>
<td>358</td>
</tr>
<tr>
<td></td>
<td>2nd</td>
<td>3,775</td>
<td>8</td>
<td>230</td>
</tr>
<tr>
<td></td>
<td>3rd</td>
<td>37,808</td>
<td>77</td>
<td>1,921</td>
</tr>
<tr>
<td></td>
<td>Total July</td>
<td>48,689</td>
<td>100</td>
<td>£2,509</td>
</tr>
<tr>
<td>August</td>
<td>1st</td>
<td>6,561</td>
<td>13</td>
<td>343</td>
</tr>
<tr>
<td></td>
<td>2nd</td>
<td>1,700</td>
<td>4</td>
<td>231</td>
</tr>
<tr>
<td></td>
<td>3rd</td>
<td>40,352</td>
<td>83</td>
<td>2,205</td>
</tr>
<tr>
<td></td>
<td>Total August</td>
<td>48,613</td>
<td>100</td>
<td>£2,779</td>
</tr>
<tr>
<td>September</td>
<td>1st</td>
<td>9,026</td>
<td>18</td>
<td>349</td>
</tr>
<tr>
<td></td>
<td>2nd</td>
<td>1,645</td>
<td>3</td>
<td>237</td>
</tr>
<tr>
<td></td>
<td>3rd</td>
<td>40,564</td>
<td>79</td>
<td>2,017</td>
</tr>
<tr>
<td></td>
<td>Total September</td>
<td>51,235</td>
<td>100</td>
<td>£2,603</td>
</tr>
</tbody>
</table>

This shews very clearly the preponderating importance of the third class passenger. The second class passengers do not only bring in less revenue than the first class, but are only about one third of the number of the latter. The accommodation provided, however, is out of all proportion to the revenue received; thus on the Water Street-Bo train one and a-half coaches are allotted to the first class, the same to the second class, and three coaches to the third class. One-fourth of the whole accommodation is thus reserved for the second class, a proportion which is quite unjustified; and, in fact, the second class compartments are always nearly empty.
The very small number of second class passengers raises the query as to whether it would be advisable to reduce the fares or abolish the class altogether. The arguments which have been adduced in favour of the former course are that there is a considerable body of non-native Africans who would travel second class in preference to third class if it could afford it. This applies more particularly to those living inside the Colony itself but outside the Freetown area. These people are, however, rather restricted as to the localities they inhabit and their range of travel, and already enjoy lower first and third class fares to and from Kissy so far as local trains are concerned. The wealthier non-native African who travels into the Protectorate usually goes either first or second class already, and the poorer ones who now travel third would probably not travel second even if the fares were reduced. From these facts I am inclined to think that though the number of this class, who would travel second class in preference to third, may give an impression in their own locality of being fairly large, they become very few when examined from the standpoint of the Railway as a whole, and are also probably a good deal more vocal than their numbers justify. This view is also supported by the railway officials I consulted, and I am inclined to think that no extra revenue would be gathered if a reduction was made.

There remains the alternative of abolishing the second class altogether. There is no question that at the present time it certainly does not justify its existence; it occupies a lot of space, entails much empty haulage and pays little revenue. Even taking the extreme case and supposing that the full numbers now travelling second went third at the reduced rate of 1/2d. a mile, the loss in revenue would be only £180 a month, and this would alone nearly be compensated for in the long run by the saving in purchase of rolling stock, gain in haulage, etc. But there is no need to contemplate this extreme case; many of those now travelling second would certainly go first in preference to the discomforts and loss of social status entailed in travelling third. In this it must be remembered that I am referring to the main line train service, although it applies also to a certain extent to the local service.

On the other hand, if the first class fares were reduced to 4d. a mile, quite a number, and probably the large majority, of those now travelling second at 2 1/2d. a mile would go first, sufficient, in fact, to compensate for the loss on those who would travel third. There would, of course, in this case be a small loss in revenue from those who now travel first, but this would be insignificant. In fact, as pointed out earlier, the total revenue from this source is so small compared with that from the third class, and the disadvantages and cost are so great that its disappearance would not be a serious matter.

The introduction of a lower third class fare will entail the allocation of more accommodation for that class. At present the passenger trains between Water Street and Pendembu are all fitted throughout with automatic brakes, and as this
standard of braking has been reached, it would be a pity not to maintain it, but it is not essential. The Bo-Pendembu trains could be run with hand brakes, as was the practice until recently. This could be avoided, however, and the whole of the stock necessary for the increased demand of the third class passengers could be found by a redistribution of the existing vehicles, provided the second class is abolished.

To sum up, the advantages in favour of abolishing second class are that the revenue it returns is incommensurate with the accommodation and expenditure it requires; the loss due to the disappearance of this traffic would be small; by a reduction of the first class fares to 4d. a mile it is probable that little if any loss will be entailed, and by a redistribution of stock a fuller service can be instituted capable of taking an increased third class traffic without lowering the standard of braking passenger trains.

The two proposals, i.e., to reduce third class fares to 1/2d. a mile and to abolish the second class are of course quite independent of each other. If the former is introduced and not the latter, it will only mean that the Bo-Pendembu trains will have, as formerly, to be run on hand brakes until the money can be found to fit more stock with automatic brakes.

37. It will be necessary in order to give effect to these recommendations to run one daily passenger train each way on both sections, Water Street – Bo and Bo – Pendembu. It will probably be necessary to increase this later. Each train will require 2 first and 4 second class carriages, and as four trains will be required this will mean 8 first and 16 third class coaches. A fair allowance as spare for repairs will be 1 first and 2 third class coaches, making a total of 9 first and 18 third class coaches, or 27 vehicles required in all. There are ample baggage vans fitted with automatic brakes so that they do not require special consideration.

The present stock of coaches fitted with automatic brakes and lavatories is 4 first class, 2 composite first and second class, 5 second class and 12 third class coaches. Two of the composite carriages and three of the second class could be converted into first class by gutting the second class portion and putting in chairs and small folding tables. This will provide the 9 first class coaches required; the remaining second class coaches can be converted to third class at very small expense. These, with the 12 existing third class coaches, will provide 14 out of the 18 third class coaches required. The remaining four can be found from the reserve stock and that used for local service. For instance, the institution of a daily train each way will do away with the need for the mixed train from Boia to Water Street and back thrice weekly, and make that stock available. It will, however, require fitting with lavatory accommodation and automatic brakes. Three sets of the former are already in store, and the brake gear can be found by removing and adapting the brake gear now fitted to many of the goods stock, notably the diamond frame bogies, where it is at present serving no useful purpose as the
wagons are not in traffic. Probably the gear to these trucks has only 12 inch as
against the 15 inch cylinder fitted to the coaching stock; the only disadvantage
of this will be slightly less braking power, but it can be used perfectly well and
without danger. The extra first class accommodation provided will allow certain
of this accommodation to be reserved in whatever manner may be considered
advisable. The total cost of this proposal should certainly not exceed £200.

The suppression of the train between Water Street and Boia and return three
times a week will automatically entail the suppression of its extension to Moy-
amba and return once a week. It should be noted that the institution of a daily
passenger train will not improve the communication between Boia and Free-
town, but the principal increase in passengers is to be looked for in the sections
beyond Boia, where the number of trains will be doubled.

38. The service on the branch line consists of a mixed train from Boia to
Makump on Mondays, Wednesdays and Fridays, leaving the / former place on
the arrival of the up passenger train from Water Street. It returns from Makump
on Tuesdays, Thursdays and Saturdays in time to catch the down passenger train
to Water Street at Boia. North of Makump there is a similar mixed train service
to Kamabai, three times a week, returning from Kamabai to Makump on the fol-
lowing days. The important place on this branch is Makene, and all passengers to
there from Water Street have to spend the night at Makump, 16 miles short of
it, and go on the following morning. Similarly they have to spend a night there
on the way down. As opposed to this inconvenience, the service north of Mak-
ene is better than the traffic justifies. A bi-weekly instead of a tri-weekly service
would satisfy all present requirements. The reason for the selection of Makump
as the halt for the night is that an engine shed was erected there when it was the
terminus of the line, and this has influenced the time table ever since, despite the
extension of the railway.

The service which I recommend should take its place is that on Mondays and
Wednesdays the mixed train should continue to Makene and stable there. On
Tuesdays and Thursdays this mixed train should continue as early as possible in
the morning from Makene to Kamabai and return to Boia. The passengers from
this would on the present main line time table proceed to Water Street by the
mixed daily at 9.0 a.m. On Fridays the up mixed train from Boia, instead of sta-
bling at Makene, would return to Makump and stable there, continuing to Boia
the next morning in time to catch the down passenger train.

The main disadvantages which were placed before me against this time table
are that the run from Makene to Kamabai and return to Boia would be very long
for the engine crew. It is not, however, longer either in time or distance, than the
present run from Water Street to Bo. If after reasonable trial it is found too long
in practice, a reserve engine crew can be stationed at Makene to work the engine
between there and Kamabai and back, but this course should not be adopted if it
can be avoided. The second objection is that the engine would have to stable out at a place where there is no fitter to carry out repairs, but against this it must be stated that an engine should be capable of running 208 miles without attention from a fitter.

The advantages are very considerable. On the up journey passengers can get through from Water Street to Makene in a day; the whole of the shed staff at Makump, except two pump boys, can be retrenched as well as the extra train and engine crews stationed there, and the train inspector. The two engines now stationed at Makump can be withdrawn, and, leaving one for reserve at Boia, the second would be spare. All engines on the branch line would be under the constant supervision of the European fitter in charge at Boia. The reduction in staff would mean a saving of at least £400 a year, which does not include any saving in money due to one engine becoming spare and available for work elsewhere. These advantages, in my opinion, completely outweigh the disadvantages, and I accordingly included it amongst the recommendations which I made to His Excellency the Governor before I left the Colony. It is very probable that a better service than the one detailed above could be arranged by alterations to the time table between Water Street and Boia, but one of the chief objects to be sought in such re-arrangement must be the elimination of the engine shed at Makump. The service proposed is based on the existing time table and fares; with the introduction of a 1/2d. third class fare the increase in traffic would probably justify a daily mixed service between Boia and Makene which would, of course, necessitate a modification in the time table now proposed.

39. On the section between Water Street and Kissy not only are / especially between Water Street and Cline Town, between which a passenger has the choice of no less than eleven pairs of trains a day. I endeavoured to obtain definite figures of the number of passengers on these trains, but was unsuccessful. From close personal observation, however, I am of opinion that the importance of this traffic has been overestimated, as well as the revenue obtained from it. The majority of the trains run more than half empty, and a large proportion of the passengers are railway employees at privileged rates. The traffic authorities informed me that practically all the local trains were engined by the locomotives going to or returning from shunting work at Water Street and Government Wharf or work on the Mountain section. So long as this is true there is a profit in running them, as the locomotives are earning money instead of running light, but I am of opinion that this does not hold good in all cases, and as these trains seldom carry enough passengers to cover the extra running costs of fuel and wages of the crew, any train where this condition is not fulfilled is running at a loss and should be cut out.

In particular I think the train to and from Kissy leaving Water Street at 10.35 a.m. could be suppressed as well as the similar train leaving Water Street at 3.45
p.m. The latter carries principally nonnative African Railway and Government officials living at Kissy, many of whom travel on concession tickets. By adjustment of the time table this train could be started slightly later and amalgamated with the one leaving Water Street for Waterloo at 4.35 p.m.

40. The fares for this local service are on the whole lower than on the main line, being 10d. first class and 4d. third class from Water Street to Kissy, a distance of 4 3/4 miles, and 6d. first class and 3d. third class between Water Street and Cline Town, a distance of 2 1/4 miles. There are no cheap second class local fares and it will also be noted that the third class local fares are also somewhat irregular as regards the price per mile. I think there would be an advantage in retaining the cheap first class fares, as the service is essentially a suburban one, and it is in the interests of the Railway to encourage it. With the introduction of a 1/2d. a mile third class fares the local third class fares would have to be reduced to the same figure, and, although the same increase is not to be looked for as on the main line, a small increase in revenue may be anticipated, provided the mistake made in the present tariff of rounding the fare off to the nearest penny is not continued.

These local services are nothing more than tram services, and in tram and omnibus services in England the difference of a half penny in the fare produces a marked difference in the traffic. This has still more force in Africa, where a half penny is a more important thing to the average inhabitant than it is to the man in England; it will buy him nearly half the rice he eats in a day. Fares should be rounded off to the nearest half penny above; thus the third class fare from Kissy to Water Street would be 2 1/2d. and from Water Street to Cline Town 1 1/2d. For this sum it may be possible to get the average native to use the local service, which he does not do at present, and even with the reduced train service there will be ample accommodation for double the numbers now travelling.

Fares on the main system also should be rounded off to the nearest half penny above and not to the next penny.

41. There has been in the past a good deal of correspondence tending to show that there has been a considerable loss of revenue through fraud, either by passengers getting in without buying tickets and hoping to reach their destination before being intercepted and made to pay, or through passengers buying a ticket for a station short of their destination and hoping they will not be caught and made to pay the excess. Many of the up-country stations are unfenced and passengers get on to the trains without tickets and pay their fares to the Inspector on the train. All passengers from flag stations have necessarily to pay on the train. All trains carry train inspectors and this in itself induces passengers, who have no intent whatever to defraud, not to worry about buying a ticket first. I studied this question closely, and came to the opinion that the reports of the revenue lost in this way were exaggerated. In this view I am supported by the European Traffic
and Accountant officials. The former on several occasions, before my inspection was mooted, had stopped trains in section and made surprise checks with quite satisfactory results. On the particular check made by one of the audit staff a sum of over £2 was collected, but there was nothing to show that the whole of this sum would not have been collected in the ordinary course by the train inspector. Leakage occurs to a certain extent on every railway, and no doubt it occurs on the Sierra Leone Railway too, but I am confident that the amount lost would not justify the engagement of extra staff, beyond that now employed, to guard against it. It would certainly not justify the appointment of the one or two European Ticket Inspectors recommended by the Audit Department.

42. It would be advisable, however, to institute a deterrent to passengers getting into trains without first buying tickets. It is only right that such passengers should be called on to pay more, as the Railway has instituted machinery to enable them to buy tickets, and, if they do not choose to avail themselves of it, it is only just that they should be called on to pay an extra fee for the trouble and expense which they cause to the Railway.

Under the Railway Ordinance a person who has not bought a ticket before entering a train is liable to pay the fare from the place from which the train started irrespective of whether any intent to defraud is proved or not. Under English law this does not hold where there is no intent to defraud, and even if it was upheld in the Colony the administrative difficulties in the way of allowing it to be applied by subordinate officials makes it unworkable in practice.

I would suggest that the Railway should be empowered to charge a fee of 25 per cent. of the fare, with a minimum charge of 6d., to all persons who enter a railway carriage for the purpose of travelling without having first bought their tickets, and that legislation be introduced to give effect to this. Exception would have to be made in the case of persons getting in at recognised points such as flag stations, where there is no booking office, and it would be the duty of the train inspector to inspect all tickets before arrival at such points.

104. In my report on the Gold Coast Railways I drew attention to the fact that, while the official ‘Codification of the Powers of the General Manager’ lays down that service on State Railways must differ from service in other Government Departments, in practice this principle is only applied to certain employees in the lower grades.

On the Sierra Leone Railway the same situation exists, and the same paragraph appears in the ‘Codification of the Powers of the General Manager.’ It reads as follows:

‘The retention of the services of the employees on the railway is dependent on the efficiency with which they conduct their several duties. Service on State Railways must from its nature differ from service in other Government Departments, and the efficiency of the staff will, in consequence, have to be measured

Conditions of Service.
by tests similar to those that govern service under railway companies working with a view to profit.’

I would once again urge the unsuitability of the Civil Service Regulations to the conditions of a railway. The very representative committee appointed under the chairmanship of Sir William Acworth to enquire into the administration of Indian Railways recorded a unanimous opinion to the same effect. This unsuitability is frankly recognised in the codification of powers, but is limited in practice to the less important members of the staff. Such grades as stationmasters, engine drivers, artizans and telegraph clerks, provided their salaries are paid out of specific and not block votes, come under the same regulations as the Civil Service. This undoubtedly weakens the authority of the General Manager, and impairs the efficiency of the Railway. Promotion comes to be governed principally by the claims of seniority and not merit. The General Manager has difficulty in dispensing with the services of an employee unless he has committed some flagrant act of inefficiency. These factors must react on the efficiency of the staff, because the lazy man knows that provided he does not commit any gross error he will receive promotion in due course and survive to enjoy a pension while the keen man soon realises that his efforts can only avail to a small extent in promoting him over the heads of his less deserving colleagues.

In the lower grades, such as firemen, turners or fitters, paid from block votes where Civil Service Regulations do not hold, each man knows that his hopes of promotion and more pay depend on his acquiring a better knowledge of his trade and his capacity to show his superior officers that he has done so, and that if he proves himself inefficient it is most unlikely that he will get a higher wage and may be dismissed. These principles should not be confined to the lower grades; they should obtain throughout the service.

105. The question of conditions of service is of necessity intimately connected with that of pensions. Under the existing regulations, once a man has been appointed to any of the posts specifically mentioned in the Estimates and has been confirmed in that post he becomes pensionable. Confirmation usually takes place about three years after first appointment. Once a man is pensionable he acquires certain rights which make it very hard in practice to remove him except on a proven charge of misconduct or inefficiency, and give him a right to compensation if it is required for any other reason to dispense with his services. I have endeavoured in the previous reports I have written on Colonial Railways to point out the objections to the present pensions system. The feeling induced of a prescriptive right to office, the reluctance to reduce or dismiss men who have spent some years in the service but have not maintained their efficiency, the indefiniteness of the Railway’s commitments, all constitute strong arguments against its continuance. That the efficiency of the Railway is thus impaired is illustrated by the number of senior officials who have complained to me how
often men slack off in their work once they are confirmed and regard themselves as settled safely for life. In certain doubtful cases employees are not confirmed in their appointments after the usual period of employment, but are retained on the unconfirmed list. This is hardly fair to the individual, because he may be left unconfirmed, not on account of inefficiency, but because it is uncertain that his post will remain a permanent one. The man is left in a state of complete uncertainty as to his future, and may find at the end that his agreement is terminated after several years’ employment, without receiving any gratuity, whereas under a provident fund scheme he would receive a certain sum from the fund.

The recent retrenchments which it has been necessary to carry out in Sierra Leone brought very vividly to the fore other disadvantages. Men had to be chosen for retrenchment solely on the grounds of whether they had been confirmed or not and entirely irrespective of their merits; a man, however excellent his work might be, provided he was unconfirmed, would have to be retrenched before a man who was distinctly inferior to him because the Railway would have to pay heavy compensation in the latter case.

The very fact that compensation has to be paid to every pensionable man whose services are not required, may and probably does prevent retrenchment being carried out to the proper extent.

None of these disadvantages hold in the case of a provident fund; the Railway knows exactly what its financial liabilities are, and the necessary sums are put by yearly out of revenue so that no unexpected call can arise; each man knows that his continued employment depends on his work and efficiency and a constant stimulus is always present. If at any time the Railway wishes to dispense with the services of an individual it can do so without incurring extra expense, while at the same time the man receives from the Provident Fund, except in cases of dismissal for misconduct, both his own and the Railway’s contribution, plus the accrued interest together with a gratuity in certain cases. He thus has a certain sum varying in amount with the number of years he has spent on the Railway and the wages he has received and with which he can maintain himself until he obtains other employment.

106. As the conditions on the Sierra Leone Railway are practically identical with those on the Gold Coast, I am of opinion that the recommendations which I made in the latter case should apply to the former, both in the case of European and African Staff. The relevant passages of those recommendations were as follows:–

‘I would propose that although candidates shall still be required to pass the Civil Service examination, or its equivalent, / none of the African staff joining after a determined date should be regarded as Civil Servants; for purposes of promotion the staff in each department should be graded according to the appointments and posts they are holding, such as 1st, 2nd and 3rd grade
station-masters, booking clerks, parcels clerks, signallers, 1st and 2nd grade engine-drivers. Promotion from grade to grade would be made by the General Manager and solely by selection, yearly increments inside the respective grades being governed by the same rules as at present.

The General Manager should have the power to appoint, promote, reduce or dismiss all African staff within the limits sanctioned in the Annual Estimates, and subject to the right of appeal to the Governor.

The General Manager already possesses such powers in relation to the non-pensionable staff, and provided no change is made in the existing regulations, they would be applicable automatically to all new staff. No new principle is thus involved.

In lieu of pensions a Provident Fund should be established on the lines of that in force on the Uganda Railway. The basis of this scheme, briefly stated, is that every member contributes 1/12th of his salary per month, and the Railways contribute a sum equivalent to 1/16th of the member's salary, except under certain conditions as to the net revenue of the Railways, when they contribute 1/12th instead of 1/16th. Interest accumulates on these contributions in accordance with the rate decided on yearly, and as the interest received on the whole fund permits. All members of the staff receiving more than a certain salary per month are compulsory members of the Fund; the limit of salary which an employee must get before he is compelled to contribute is fixed approximately to exclude ordinary unskilled labourers. In the event of dismissal the General Manager has the right to withhold all or a portion of the Railways' contribution. The General Manager at his discretion may grant an employee on retirement after 15 years' good service a gratuity from the revenue of the Railways up to half-a-month's salary for each year of service. The above gives the general conditions as applied on the Uganda Railway; they could be modified as required to suit local conditions.

The benefits which the employee would obtain under the scheme are not so great as those he now obtains when he retires on pension and to compensate for this and to prevent the Railways suffering thereby in the quality of candidates for employment in comparison with other Government departments it would be necessary to raise the pay of the Railway staff slightly. Such increase, however, should only be so great as to allow for this disparity and would cost the Railways no more than the present pensions and probably a good deal less.

It would be advisable therefore to consider a scheme which would be applicable to the whole of the staff joining after a certain date.

The above only pretends to be a brief outline, because before any scheme, whether for Europeans, Africans or both, could be adopted it would have to be the subject of lengthy and exhaustive enquiry locally, in order to fix proper grades and scales of pay, and actuarial advice would have to be sought regarding the financial condition of the Provident Fund.
I would suggest the formation of a strong committee in the Colony to carry out the enquiry which should embrace all questions of pay, conditions of service and Provident Fund, dealt with above, and submit definite proposals to His Excellency the Governor. Legislative action would be necessary if it was decided to institute a Provident Fund and these various stages would take up a considerable time.

Any change, however, whether of status or of pension, could not affect any of the permanent staff now employed, except with their own consent, because it would alter the conditions under which they were engaged. The proposal which I have to make would thus affect only those employees joining subsequent to the date of the inception of the scheme and such of the old staff as might elect to come under the new scheme.

In Chapter X. on Finance I am making certain recommendations regarding reductions of pay: these recommendations would be applicable to both the present staff and any joining subsequently to the initiation of a Provident Fund. Any slight increase of pay granted to those coming under the Provident Fund scheme to compensate for their not having pension rights would therefore be additional to the reduced pay, but the reason for its grant would have to be carefully explained to avoid discontent.

107. Another important staff question to which I have devoted a good deal of space in previous reports is that of the necessity for a more general and more frequent interchange of officials between the various Colonial railways. Each railway which I have inspected has strengthened my conviction on this point. To confine a man to a small railway for the whole of his career is both unfair to the man and injurious to the system. Officials of higher rank are often promoted at present from one railway to another; this is certainly all to the good where the railway systems themselves are so small, but such interchanges are even more desirable with the more junior officials. An infusion of new blood in the older and more responsible ranks is a gain, but a constantly renewed supply of new blood which is also young is even a greater gain. I would therefore urge that the question of the promotion of Colonial railway officials and their conditions of service should be reviewed. The objects which should be held in view when the review takes place are that whenever a vacancy occurs on any Colonial railway for District rank, the appointment should not be confined to that particular railway. All Colonial railways should be informed of the vacancy and asked for applications and recommendations. In every case the General Manager in forwarding his recommendations would be required to certify that he would be prepared to accept the candidate as a District Officer on his own railway. Nor would a General Manager be allowed to hold back a recommendation on the grounds that the candidate could not be spared; in such cases he would have to forward the application stating the reasons why he considered the candidate
could not be spared and how soon he would be available if appointed. The selection from the applications thus received would be made at the Colonial Office. By thus introducing a wider system of promotion the officials would obtain a much wider experience and knowledge which, besides being an immediate advantage, could not fail to make its effect felt when they in turn are promoted to the higher administrative posts. /  

CHAPTER IX. – MANAGEMENT AND GENERAL.  

108. One of the most important functions of the management of a railway is not only to keep close control over expenditure, but to see that the best value is being obtained from the money expended. The two are not necessarily synonymous; thus an operating department may show a saving against a particular vote or the estimate for an individual work which would appear at first sight to be an economy. If a comparison be drawn between the actual sum spent and the work done, it may quite likely appear that instead of any economy having been effected, more money has been spent than should have been. 

To both these aspects, namely, prompt control over actual monies expended, and control to ensure that each operating department is obtaining the best value for the monies it is spending, I consider that the Sierra Leone Railway, in common with the majority of the Colonial railways I have inspected, pays insufficient attention. 

The present Governor directly after his arrival instructed all Government departments to compile approximate returns of expenditure for each month by the 10th of the following month. Previously no returns of expenditure were received by the Government or the General Manager until over two months after the end of the month to which they related. 

The new returns are compiled by the various departments of the Railway and submitted by them to the Chief Accountant, who works out from them the total for the whole Railway, which he forwards to the General Manager, who in turn submits it to the Colonial Treasurer. 

But, although the materials are thus already to hand for a close and prompt control over expenditure, proper use is not made of them. The General Manager knows only the total for the Railway. Although the figures for each department are compiled he never sees them, and so is out of touch with the expenditure of departments until he receives much later the audited figures from the Chief Accountant. Departments themselves do not appear to make much use of them beyond seeing that they are keeping inside the Estimates. No attempt is made to compare the results of any one month with those of any other whether of the same or previous years.
As regards ascertaining what results have been attained for the money spent, no attempt is made to do this until the annual statistics are compiled. By this time the information is out of date; it refers to events which have happened such a long time before that it is useless for current operating purposes; it merely gives a general idea of the results of the past year. If a railway or any other commercial concern is to be run efficiently and economically, those in charge must know without delay exactly what they are doing and how much it is costing them to do it. Without such information it is impossible to attain a high standard of efficiency or economy.

On the Sierra Leone Railway it would be an easy matter to obtain this information. Departments already compile their monthly approximate expenditures and I have explained in earlier chapters how the principal statistics required for operating purposes can be obtained by the departments themselves. From these it will be quite simple to work out the cost per train mile, engine mile, ton mile, mile of line open, or whatever unit may be chosen for any particular department. These returns should be prepared by departments ready for presentation to the General Manager at latest by the 10th and preferably by the 6th of the following month. The corresponding figure for the previous month and for the same month of the previous year should be given; where there is an increase per unit in any particular department, the head of the department should not wait to be asked by the General Manager what are the reasons – he should forward with the figures satisfactory explanations for any increases and, where he is unable to find a satisfactory explanation, it should be his duty to search out the cause and eradicate it. In this way any rise in expenditure and cost per unit is at once laid bare and steps can be taken promptly to check it, and there is a constant stimulus to lower the costs of working, month by month, as it then becomes possible to judge the work of departments by their results in terms of money. The General Manager from these should in turn work out and use costs per unit for the whole Railway.

109. I have referred when reviewing the Locomotive and Stores Departments to the entire absence of adequate protection against fire; it is not confined however to these departments. In none of the departmental shops or stores were there any precautions at all against fire; no apparatus was supplied; there were not even the customary buckets of water or sand. No fire brigade had been instituted and no instructions had been issued. Night watchmen were employed but they had been given no orders as to whom to warn or what to do in case of fire. It is dangerous to allow such a situation to continue, and steps should be taken without delay to supply the proper appliances, which need not be costly, to instruct the native staff as to their duties, and institute a proper fire brigade.
110. A minor economy could be effected I consider in the preparation of the Annual Report. At present the head of each department submits a report which is included in the main report.

The majority of the information is thus repeated; for example, the so-called financial position of the Railway is given in both the General Manager’s and the Chief Accountant’s reports; so are the principal figures relating to revenue and expenditure. Both the General Manager’s and the Traffic Manager’s reports repeat in considerable detail the same information respecting the tonnage of commodities carried, passenger traffic, claims and accidents.

The General Manager must naturally refer to the principal features of the working, and if the departments report also they can hardly be silent as regards such of those features as come inside their scope; hence considerable repetition is bound to occur. The General Manager is the person responsible to the Government for the conduct of the Railway and he should be the only person who reports to the Government in respect of it, embodying in his own report such features of the reports submitted to him by his heads of departments as he thinks suitable.

CHAPTER X. – FINANCE.

111. I have had cause to comment in the reports which I have made on other Colonial railways on the form of accounts in use in which the accounts of the Railway are so intermingled with those of the Colony that only a most misleading and imperfect idea can be obtained of the financial situation of the Railway itself. This is well exemplified in the case of the Sierra Leone Government Railway. The only account given in its Annual Report is the revenue account; there are other tables giving details of revenue and expenditure and statistical results, but these are, in no sense of the word, accounts. A statement of capital expenditure is given, but this shows merely the amounts spent on loan account, not the face value of the money thus expended, on which loan charges have to be met. The loan charges which have to be paid annually by the Railway appear nowhere in the accounts of the Railway, and can only be obtained by going through the old ledgers of the Colonial Treasury.

Since 1919, a so-called statement of the financial situation of the Railway has been included in both the General Manager’s and the Chief Accountant’s reports, but this statement is quite incorrect. It gives an average figure of 3 3/4 per cent, as the rate of interest on monies raised by loan, whereas the major portion now on loan is at 4 per cent. The interest is calculated on the actual monies expended, instead of on the face value of the loan, and the figure given for sinking fund charges is incorrect for the same reason. Finally, interest at 4 3/4 per cent, is charged on extraordinary expenditure allotted to Capital Works from
the Colonial Revenue, whereas no interest whatever, of course, is paid on these sums.

The figure thus arrived at as the deficit or profit on working the Railway is not only an imaginary one; it is also incorrect.

The danger of such incorrect figures is shown by the fact that the sum of £61,000, given in the General Manager's Report for 1921 as the deficit between receipts and working expenses, has been quoted by the Secretary of State in the House of Commons as the loss for that year. Other examples of the danger of incomplete accounts are given in the reports of pre-war years; in several of these the Railway is shown as having worked at a profit, whereas if full accounts had been kept it would have been clear that there had been a loss and not a profit. There is finally the question of making allowance annually for depreciation out of revenue, and fuller reference is made to this later.

I wish to make it clear that there is no question in this of whether the Railway should make a profit, pay its way or work at a loss. That is a matter of policy and not of accounting. But, whatever the policy may be, it is essential that the Colony should know whether the Railway is making a profit or not, if it is making a profit the amount of that profit, and if it is working at a loss how much it is costing the country to maintain it. The accounts in their present form do not give this information. The force of this is shown by the fact that, contrary to what would appear from the annual reports and to the view generally held, in no single year since it started has the Railway made any contribution to the revenue of the Colony, after allowance has been made for loan charges and extraordinary expenditure. Nor is the General Manager in any better position than the Colony; although he is responsible for the undertaking he can have no clear idea of its financial position.

The first step to be taken in order to place the accounts on a satisfactory basis is to separate the accounts of the Railway from those of the Colonial Treasury.

The Railway is officially recognised as a commercial undertaking, but it is impossible to run it as such unless it has full and complete accounts of its own, preferably drawn up on the same lines as those of commercial railways. So long as its accounts are intermingled with those of the Treasury, it is impossible to obtain a clear idea of the results of working.

There is no attempt in this to escape from the control of the Treasury; such control is necessary and should be maintained by the same method of Treasury statements as now in force.

In the existing circumstances of the Railway only four accounts are required. These are respectively a Capital Account, a Revenue Account, a Nett Revenue Account and a Balance Sheet.

112. As explained earlier, the statement of Capital Expenditure as given in the General Manager's report only gives the actual monies disbursed in connec-
tion with the work; it takes no account of such matters in regard to loan funds as price of issue and expenses of issuing and managing. I have drawn up a statement of capital expenditure as at 31st December, 1921, given below in Table F/1, in which these various factors have been included and from which a capital account for the Railway can be drawn up without difficulty. I have included in the statement the total sums spent on capital works out of extraordinary expenditure, as at present shown, in the annual report. Quite rightly, a distinction has been kept between extraordinary expenditure on works which it would be legitimate to charge to capital and those which should be charged to revenue, the former being included in the capital expenditure and the latter in the revenue account.

I would draw attention to the difference between the sum of £68,256 shown therein as the figure of loan charges actually paid on account of the Railway for the year 1921, and the imaginary figure of £80,489 given in the statement of the financial position in the annual report.

113. The Revenue account would be on the same lines as that now presented, except in regard to Extraordinary Expenditure. This is at present shewn separately at the end of the expenditure, and is not included in the figures shewing the percentage of working expenses to revenue quoted in the body of the report, although it relates to replacements and minor improvements, essentially items chargeable against ordinary revenue.

These items should be included under their respective heads, but under separate sub-heads, if thought necessary to distinguish them from other expenditure.

To the net revenue account should be carried the balance of the revenue account and it should be debited with the annual loan charges. The balance of this account will give the nett profit or loss on the undertaking, the sum in fact which is either available as profit to the Colony, its owners, or has to be made good by them.

The balance sheet would contain the balances of the net revenue and capital accounts, the balance of any subsidiary funds, such as fines fund or renewals funds, if such were instituted, cash balances, and the railway portion of the balance standing to the credit of the sinking fund (82.56%), which on December 31st, 1921, amounted to £143,919 (market value). It would be simpler not to include the balance of the Railway Stores Suspense Account but to treat that as belonging exclusively to the Colony, the stores therefrom being drawn and paid for by the Railway as required.
TABLE No. F/1.

STATEMENT SHEWING CAPITAL EXPENDITURE AS AT 31st DECEMBER, 1921.

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<td>£</td>
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<tr>
<td>1904 3 1/2% Stock</td>
<td>630,005</td>
<td>579,076</td>
<td>22,050</td>
<td>6,300</td>
<td>28,350</td>
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<tr>
<td>1913 4% Loan</td>
<td>798,125</td>
<td>431,925</td>
<td>7,981</td>
<td>39,906</td>
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<td>454,989†</td>
<td>325,615‡</td>
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<tr>
<td>Total Loans</td>
<td>1,428,130</td>
<td>1,359,680</td>
<td>– 14,281</td>
<td>– 68,256</td>
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<tr>
<td>Add Capital Expen-</td>
<td>334,824</td>
<td>334,824</td>
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<td></td>
<td>£1,762,954</td>
<td>£1,694,504</td>
<td>£53,975</td>
<td>£14,281</td>
<td>£68,256 /</td>
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114. I referred earlier to the fact that the Railway has never in any single year contributed to the revenue of the Colony, after allowance has been made for loan charges and extraordinary expenditure.

Table No. F/2 shows the total sum which the Colony has found out of its own revenue in order to maintain the Railway since it first started in 1904.

**TABLE No. F/2.**

**Railway Dr. to Government**

(i) Pensions. £
As given by the Colonial Treasurer 19,048

(ii) Loan charges.
Interest 828,898
Sinking Fund 180,251
Interest on advances in anticipation of loans 97,393
1,104,540

Expenses of managing loans (as given by the Colonial Treasurer) 6,549
1,111,089

(iii) Loss on working.
Excess of Expenditure over Revenue from 1899 to 1921, figures supplied by the Colonial Treasurer:–

Expenditure (including Extraordinary Expenditure on both Capital and Revenue works) 2,399,882
Receipts 2,297,388
102,294

Total Railway Dr. to Government £1,232,431

Roughly speaking, therefore, the Colony lost one million and a quarter pounds in eighteen years of open line working.

It is true that £334,824 of the extraordinary expenditure has been spent on capital works, which it would have been legitimate to finance out of loan funds instead of revenue, but against this no allowance has been made for renewals or depreciation, and the sums already due on this account exceed by a large amount the figures given above. Certain renewals have been effected yearly from revenue, but they are very small in comparison with the depreciation which has taken place, and to make good which funds will have to be applied eventually. Even if this figure of £334,824 of extraordinary expenditure be left out there still remains a total of nearly one million pounds as the loss on the working of the Railway for eighteen years.

This again illustrates the unsatisfactory form of the present accounts; if the form which I recommend had been in use, facts of this nature, which it is essential should be known to the Government and the General Manager, if they are to gauge the financial situation correctly, would have been obvious at the first glance.
As it is, not only are they not within current knowledge, but it requires several hours of patient work to disentangle them from the Treasury ledgers and Railway reports.

115. The revenue account for 1921 shews gross takings of £161,765 and total working expenses of £243,484; to the latter have to be added loan charges of £68,256 so that the actual loss on working the Railway was £149,975. If to this be added the extraordinary expenditure out of Colonial revenue on capital works, the Colony was £208,377 out of pocket. This situation is all the more serious, because £69,000 has to be found in the next two years out of revenue to carry out renewals of track as explained in Chapter IV., and after that, although there will probably not be any more large renewals of track required for a few years, considerable sums will have to be set aside to replace the old locomotives, vehicles, tools and plant which will become worn out year by year. Arrangements have been made to find the £36,050 required for the programme of relaying in 1923 out of the revenue of the Colony, but it should be the chief aim of the Railway to cause as small a drain as possible on the Colony’s revenue and eventually to become at least self-supporting.

116. Taking the revenue side of the account first, I have explained when dealing with rates that in the present depressed state of markets any attempt to raise the rates on exports would almost certainly have such a serious effect as to cause a large drop in revenue, and two-thirds of the gross revenue comes from this source. Nor does there appear any prospect in the near future of a large increase in the quantities exported; if markets recover, a gradual yearly increase as in pre-war days may be looked for, but it would be unwise to anticipate anything more. The reduction of the third class passenger fares, and the goods traffic which will arise from it, will, I anticipate, eventually lead to a substantial increase in revenue, but this alone cannot be expected to make up the present annual deficit. The only resource therefore is to endeavour to bring the expenditure down more to a level with the earnings. On comparing the results for 1921 and 1913, it is seen that while the gross revenue for 1921 is only some £6,000 short of that for 1913 (and this is more than accounted for by the falling off of £11,000 in the traffic of palm kernels), the working expenditure has increased by over £130,000 and is two and a half times what it was in 1913. £100,000 of this is accounted for by material, as the issues for 1913 were £77,000, as against £179,000 in 1921. The major portion of this can certainly be attributed to the increase in prices, and with the present fall, especially in the price of coal, a marked improvement will undoubtedly be experienced in subsequent years. But apart from the question of prices there is scope for a reduction in the quantities used. This can best be effected as explained earlier by prompt monthly returns of approximate expenditure and costs per unit so that any rise in these costs in any of the operating departments is at once brought home to the department, and waste is prevented.
£30,000 is thus left representing the increase in working expenditure due to
the increase in the wages bill. This increase is not entirely due to the rise in wages,
as is shown by Table No. F/3 hereunder, which I have had prepared showing the
total number of persons employed in each department for the years 1913, 1914
and 1921, compared with the work performed. The figures for 1921 have been
taken on the most favourable basis to the Railway, because the work performed
is for the year 1921, whilst the numbers employed are the 1922 ones, when the
work had dropped below that of 1921, and there had been no proportional fall
in the numbers employed. / 

Apart from the Engineering Department, in which there has been a notewor-
thy reduction, all departments show considerable increases. This is most serious
in the cases of the Traffic and Locomotive Departments on account of the large
numbers employed; in both cases the rise since 1913 is about 33 per cent.

On the other hand, out of the various units of work given, in no case has the
work increased to the same extent. On the contrary the ratio of the number of
units of work per man has in every case decreased, and in some instances to a very
marked degree, whereas if due economy had been observed the reverse should
have been, the case. It is essentially true of these two operating departments that
it does not require a proportionate increase of staff to work an increased traffic.

I have made definite recommendations in this report which will reduce in a
certain measure the staff employed, but these retrenchments will not alone bring
down the number to the 1913 scale. It is only possible to indicate in certain cases
where offices can be abolished, or the exact staff which should be retrenched.
To take the case of the workshops, an inspecting officer can only point out that
excessive numbers are employed, and that it should be possible to get greater
value from each man; he cannot indicate the exact number of each trade which
can be retrenched. That is only possible to a person like the Works Manager, who
is in daily touch with the work.

It should therefore be incumbent on these two departments to reduce their
staff at least to the 1913 ratio, quite apart from any specific recommendations
made by me. Nor must this scale be considered as the ultimate objective; by the
system of monthly costs per unit for each department it should be reduced to a
figure below this.

The only comment I have to make as regards the Engineering Department
is that it must undoubtedly have been grossly overstaffed in 1913 and still more
so in 1914.

117. While these increases have undoubtedly swollen the total wages bill, the
principal increase lies in the rises in wages and salaries.

The regrading of the African staff which took place when the new scale was
introduced makes it impossible to draw a clear comparison between the previ-
ous and the present scale of wages, but the following examples of the increases
### TABLE No. F/3.
SHOWING RATIO OF NUMBERS EMPLOYED TO UNITS OF WORK DONE.

<table>
<thead>
<tr>
<th>Numbers Employed.</th>
<th>Units of Work Done.</th>
<th>Ratio of Numbers Employed to Units of Work Done</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1913</td>
<td>1914</td>
</tr>
<tr>
<td>Men</td>
<td>430</td>
<td>462</td>
</tr>
<tr>
<td>Ton miles</td>
<td>384</td>
<td>398</td>
</tr>
<tr>
<td><strong>Locomotive Department</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine miles</td>
<td>8,571,132</td>
<td>7,068,918</td>
</tr>
<tr>
<td><strong>Engineering Department</strong></td>
<td>1,646</td>
<td>2,406</td>
</tr>
</tbody>
</table>

Hammond, Report on the Sierra Leone Government Railway
in wages of certain large categories show how large the increases were in certain classes:

<table>
<thead>
<tr>
<th>Category</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unskilled labour</td>
<td>66 per cent.</td>
</tr>
<tr>
<td>Skilled artizans, maximum wage</td>
<td>100 per cent.</td>
</tr>
<tr>
<td>Telegraph clerks, minimum wage</td>
<td>78 per cent.</td>
</tr>
<tr>
<td>Stationmasters, minimum wage</td>
<td>167 per cent.</td>
</tr>
<tr>
<td>Lowest grade of clerk above rank of probationer, minimum wage</td>
<td>100 per cent.</td>
</tr>
<tr>
<td>European platelayers, minimum wage</td>
<td>100 per cent.</td>
</tr>
<tr>
<td>European fitters, turners and artizans, minimum wage</td>
<td>87 per cent.</td>
</tr>
</tbody>
</table>

Taking first the largest class, that of unskilled labour, its wage has gone up from 9d. to 1s. 3d. per day, to which figure it was raised in 1919, at a time when prices and cost of living were at their highest, and there was a boom in produce. Although prices have dropped considerably since then and the supply of labour now largely exceeds the demand, there has been no reduction in the rate of wage. I made careful enquiries in various directions, as a result of which I am convinced, and my opinion is corroborated by all the political officers with whom I discussed the matter, that the Railway could obtain as much unskilled labour as it requires outside the Freetown area at 9d. a day. I recommend therefore that this scale should be introduced and that the line up to Waterloo inclusive should be treated as the Freetown area with a rate of 1s. a day. I have chosen Waterloo as the limit of the zone, because outside that zone labourers are only given temporary native houses, and this marks fairly closely the point where the cost of living changes.

I include as unskilled labour those in maintenance gangs, because when taken on they are quite unskilled, and can only be claimed as semi-skilled after they have spent some time on the Railway learning their work. After two years’ service a rise of 3d. a day can be given to pointsmen, maintenance boys, etc., who may be considered as having attained a general proficiency and have become semi-skilled; but this should not be granted to boys engaged on simple labouring work such as grass cutting. Any time already spent in the grade should count towards the increment and those boys who had already worked in maintenance gangs, or similar employment for two years would automatically become eligible for 1s. a day up-country, and 1s. 3d. a day in the Freetown area.

It has been contended that the natives of these grades were given to understand at the time it was introduced that this wage of 1s. 3d. a day was a permanent salary. I can find no documentary evidence either in the published circulars or elsewhere that the Government took the view that it was incumbent on them to maintain this scale for all time, irrespective of any drop in the cost of living, and any verbal assurance which may have been given as to its unchangeable character would appear to have been quite unauthorised. It is also manifestly improbable
that the Government would give such an assurance, nor can any implication to that effect be read into the fact that the rise was effected by issuing a new scale of salaries instead of increasing the war bonus. I am also of opinion that little trouble would be experienced provided the reasons for the reductions were properly explained to those affected a month or six weeks in advance of its inception; force of circumstances and the prevalent unemployment would probably compel them to accept it without demur even if they were inclined to cause trouble.

118. The question of the reduction of wages of African skilled labour and salaried staff and European staff is not so simple as that of unskilled labour. Especially in the case of skilled artizans the only source of supply is the Railway itself, which trains up the staff it requires, and just as there is no outside source of supply so there is no outside demand, or at any rate no appreciable demand for many classes of this labour. It is thus not merely a straightforward question of supply and demand; this is no doubt still the predominating factor, but it is no longer the only factor of moment. A certain amount of weight must be given to the cost of living.

Whilst I do not want to exaggerate this factor it is one which must be taken into account more especially when judging the wages paid to Europeans and non-native Africans, and for this reason I have prepared certain statistics, bearing on the rise which has taken place as affecting European, non-native African and African employees.

These calculations have been based, as regards local commodities, on the average of the figures obtained from the political officers and trading firms and, as regards imported commodities, on the average of the prices obtained from several trading firms to whom my thanks are due for having supplied me with full information not only in respect of present, but also of pre-war prices.

The sources from which I drew my information were thus sufficiently numerous and varied to prevent danger of exaggeration in any particular direction, and to ensure that the bases on which the calculations have been drawn are correct within a narrow margin. The method adopted is the same as that used by the Ministry of Labour.

119. Taking first the case of the native, the three necessities of life are rice, palm oil and cotton goods. In certain cases ‘fu-fu’ is substituted for rice, but this is a cheaper commodity, and so rice has been taken as the standard.

The average price of rice in 1914 was 71d. per bushel, and in 1922 122d. per bushel, an increase of 72 per cent. This price of 122d. per bushel was taken just before the harvest and so in reality represents the average maximum price. Allowing half a bushel a month at prewar figures gives an expenditure of approximately 35d. per month in 1914, and the proportion of expenditure is 35.

The average price of palm oil in 1914 was 81d. and in 1922 70d. per four gallons, or a decrease of 14 per cent. Assuming an allowance of half-gallon a
month at pre-war figures gives an expenditure of approximately 10d. per month in 1914, and a proportion of expenditure of 10.

The average price of cotton per yard was 4 1/2d. in 1914, and 111 1/2d. in 1922, an increase of 155 per cent. Allowing an expenditure of 50s. per annum, or 50d. per month, gives a proportion of expenditure of 50.

Housing does not affect him as he either gets one from the Railway or builds one for himself.

The increase in the cost of living is therefore:

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Proportion of Expenditure</th>
<th>Increase % of 1922 over 1914</th>
<th>Result of Multiplying Column 2 by Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>35</td>
<td>72</td>
<td>2,520</td>
</tr>
<tr>
<td>Cotton</td>
<td>50</td>
<td>155</td>
<td>7,750</td>
</tr>
<tr>
<td>Palm oil</td>
<td>85</td>
<td>Decrease 14 per cent.</td>
<td>140</td>
</tr>
<tr>
<td>Totals</td>
<td>95</td>
<td></td>
<td>10,130</td>
</tr>
</tbody>
</table>

Dividing the total of column 4 by the total of column 2 gives an average increase of 106 per cent. His total monthly expenditure, as above, is 95d. as against a monthly wage of 234d., assuming he works 26 days a month at 9d. a day, or 41 per cent. of his pay. The allowance of rice and palm oil is sufficient for himself, but that for clothing allows for the whole of his family. It is unnecessary to make any allowance for his wife's food as in every case she may be taken as earning at least that much on her own account and probably a good deal more. An increase of 106 per cent. on 41 per cent. of the native's pay gives a net increase on his total pay of 44 per cent. Two points to which attention should be directed are that the rate of pay has been taken at 9d. a day, the figure to which I have recommended the rate of unskilled labour should be reduced and that even on this reduced pay necessities only represent 41 per cent. of the total wage. Thus even from the point of view of cost of living a reduction to 9d. a day is amply justified.

120. Turning next to the question of European salaries as they are simpler than those of the skilled and clerical local staff, I have prepared the following table showing the relative cost of a European's food, fuel and light in the Colony in the years 1914, 1921 and 1922.

This table has been drawn up in accordance with the method adopted by the Ministry of Labour and the same ‘weight numbers’ have been adopted. The term ‘weight numbers’ requires some explanation; it bears necessarily no relation to the actual weight of the commodity consumed; it is merely a number based on the relative importance of the several articles. As explained earlier the prices given are the average of those obtained from several sources and may be considered accurate within a narrow margin.
<table>
<thead>
<tr>
<th>Commodity</th>
<th>Weight Nos. based on expenditure on these commodities</th>
<th>1914 Prices</th>
<th>1921 Prices</th>
<th>Increase Over 1914.</th>
<th>Result of multiplying 2 by 6.</th>
<th>1922 Prices</th>
<th>Increase Over 1914.</th>
<th>Result of multiplying 2 by 10.</th>
<th>Decrease Since 1921, Result of multiplying 2 by 13.</th>
<th>Amount.</th>
<th>%</th>
<th>Amount.</th>
<th>%</th>
<th>Amount.</th>
<th>%</th>
<th>Amount.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef</td>
<td></td>
<td>48 s. d.</td>
<td>9 s. d.</td>
<td>10 s. d.</td>
<td>1,600 s. d.</td>
<td>10 s. d.</td>
<td>3 s. d.</td>
<td>33 1/3 s. d.</td>
<td>1,600 s. d.</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Mutton</td>
<td></td>
<td>24 s. d.</td>
<td>10 s. d.</td>
<td>16 s. d.</td>
<td>1,200 s. d.</td>
<td>16 s. d.</td>
<td>6 s. d.</td>
<td>50 s. d.</td>
<td>1,200 s. d.</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Bacon</td>
<td></td>
<td>19 s. d.</td>
<td>13 s. d.</td>
<td>46 s. d.</td>
<td>940 s. d.</td>
<td>20 s. d.</td>
<td>9 s. d.</td>
<td>60 s. d.</td>
<td>1,140 s. d.</td>
<td>2 s. d.</td>
<td>56</td>
<td>2 s. d.</td>
<td>56</td>
<td>1,064 s. d.</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td></td>
<td>9 s. d.</td>
<td>10 s. d.</td>
<td>10 s. d.</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Flour</td>
<td></td>
<td>20 s. d.</td>
<td>30 s. d.</td>
<td>84 s. d.</td>
<td>5,600 s. d.</td>
<td>77 s. d.</td>
<td>9 s. d.</td>
<td>47 s. d.</td>
<td>160 s. d.</td>
<td>3 s. d.</td>
<td>64</td>
<td>3 s. d.</td>
<td>64</td>
<td>3,200 s. d.</td>
<td>56</td>
<td>3 s. d.</td>
<td>56</td>
</tr>
<tr>
<td>Bread</td>
<td></td>
<td>50 s. d.</td>
<td>3 s. d.</td>
<td>9 s. d.</td>
<td>10,000 s. d.</td>
<td>6 s. d.</td>
<td>3 s. d.</td>
<td>100 s. d.</td>
<td>5,000 s. d.</td>
<td>3 s. d.</td>
<td>66</td>
<td>3 s. d.</td>
<td>66</td>
<td>1,667 s. d.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tea</td>
<td></td>
<td>22 s. d.</td>
<td>2 s. d.</td>
<td>40 s. d.</td>
<td>2,200 s. d.</td>
<td>39 s. d.</td>
<td>1 s. d.</td>
<td>88 s. d.</td>
<td>1,936 s. d.</td>
<td>3 s. d.</td>
<td>6</td>
<td>3 s. d.</td>
<td>6</td>
<td>132 s. d.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugar</td>
<td></td>
<td>19 s. d.</td>
<td>3 s. d.</td>
<td>9 s. d.</td>
<td>3,800 s. d.</td>
<td>8 s. d.</td>
<td>5 s. d.</td>
<td>166 s. d.</td>
<td>3,154 s. d.</td>
<td>1 s. d.</td>
<td>11</td>
<td>1 s. d.</td>
<td>11</td>
<td>209 s. d.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td></td>
<td>25 s. d.</td>
<td>3 s. d.</td>
<td>60 s. d.</td>
<td>3,275 s. d.</td>
<td>50 s. d.</td>
<td>1 s. d.</td>
<td>54 s. d.</td>
<td>1,350 s. d.</td>
<td>2 s. d.</td>
<td>33</td>
<td>1 s. d.</td>
<td>33</td>
<td>1,833 s. d.</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butter</td>
<td></td>
<td>41 s. d.</td>
<td>10 s. d.</td>
<td>30 s. d.</td>
<td>8,200 s. d.</td>
<td>24 s. d.</td>
<td>1 s. d.</td>
<td>133 s. d.</td>
<td>5,453 s. d.</td>
<td>8 s. d.</td>
<td>22</td>
<td>8 s. d.</td>
<td>22</td>
<td>902 s. d.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cheese</td>
<td></td>
<td>10 s. d.</td>
<td>16 s. d.</td>
<td>36 s. d.</td>
<td>1,330 s. d.</td>
<td>21 s. d.</td>
<td>7 s. d.</td>
<td>39 s. d.</td>
<td>390 s. d.</td>
<td>1 s. d.</td>
<td>15</td>
<td>1 s. d.</td>
<td>15</td>
<td>400 s. d.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lard</td>
<td></td>
<td>10 s. d.</td>
<td>11 s. d.</td>
<td>111 s. d.</td>
<td>1,090 s. d.</td>
<td>15 s. d.</td>
<td>6 s. d.</td>
<td>55 s. d.</td>
<td>550 s. d.</td>
<td>6 s. d.</td>
<td>26</td>
<td>6 s. d.</td>
<td>26</td>
<td>260 s. d.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td></td>
<td>19 s. d.</td>
<td>9 s. d.</td>
<td>20 s. d.</td>
<td>3,173 s. d.</td>
<td>16 s. d.</td>
<td>9 s. d.</td>
<td>100 s. d.</td>
<td>1,900 s. d.</td>
<td>6 s. d.</td>
<td>25</td>
<td>6 s. d.</td>
<td>25</td>
<td>475 s. d.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potatoes</td>
<td></td>
<td>18 s. d.</td>
<td>13 s. d.</td>
<td>210 s. d.</td>
<td>1,098 s. d.</td>
<td>134 s. d.</td>
<td>4 s. d.</td>
<td>21/2 s. d.</td>
<td>45 s. d.</td>
<td>7 s. d.</td>
<td>36</td>
<td>7 s. d.</td>
<td>36</td>
<td>648 s. d.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>334 s. d.</td>
<td>– s. d.</td>
<td>– s. d.</td>
<td>47,506 s. d.</td>
<td>– s. d.</td>
<td>– s. d.</td>
<td>– s. d.</td>
<td>26,918 s. d.</td>
<td>– s. d.</td>
<td>7</td>
<td>– s. d.</td>
<td>7</td>
<td>7,230 s. d.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage Increase</td>
<td>1921 over 1914: – 47,506 ÷ 334 = 142%</td>
<td>1922 over 1914: – 26,918 ÷ 334 = 80.5%</td>
<td>Decrease: 7,230 ÷ 334 = 21.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commodity</td>
<td>Weight Nos.</td>
<td>1914</td>
<td>1921</td>
<td>Increase Over 1914</td>
<td>Result of multiplying 2 by 6</td>
<td>1922</td>
<td>Increase Over 1914</td>
<td>Result of multiplying 2 by 10</td>
<td>Decrease Since 1921</td>
<td>Result of multiplying 2 by 13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>s. d.</td>
<td></td>
<td></td>
<td>Amount %</td>
<td>s. d.</td>
<td></td>
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<td>s. d.</td>
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<td>s. d.</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Kerosene</td>
<td>50</td>
<td>11</td>
<td>3</td>
<td>24</td>
<td>12 s. d.</td>
<td>9</td>
<td>113</td>
<td>5,650 s. d.</td>
<td>17 s. d.</td>
<td>51 s. d.</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Wood Fuel</td>
<td>15</td>
<td>10</td>
<td>0</td>
<td>25</td>
<td>15 s. d.</td>
<td>0</td>
<td>150</td>
<td>2,250 s. d.</td>
<td>20 s. d.</td>
<td>100 s. d.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>65</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Percentage Increase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1921 over 1914: 7,900 ÷ 65 = 122%</td>
<td></td>
<td></td>
<td>1922 over 1914: 4,050 ÷ 65 = 62%</td>
<td>Decrease: 1,750 ÷ 65 = 27%</td>
<td></td>
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</tr>
</tbody>
</table>
It will be seen from these tables that food for Europeans has increased 80.5 per cent. and fuel and light 62 per cent. since 1914.

The Ministry of Labour calculate the following proportions of a family expenditure:

<table>
<thead>
<tr>
<th>Item</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>7 ½</td>
</tr>
<tr>
<td>Rent</td>
<td>2</td>
</tr>
<tr>
<td>Clothing</td>
<td>1 ½</td>
</tr>
<tr>
<td>Fuel and light</td>
<td>1</td>
</tr>
<tr>
<td>Other items</td>
<td>½</td>
</tr>
<tr>
<td>Total</td>
<td>12 ½</td>
</tr>
</tbody>
</table>

Of the above items rent does not enter into the calculation as quarters are provided free, clothing is bought mostly in England, when the home figure would apply, and ‘other items’ would be too insignificant in the case of necessaries to alter the final result materially.

The index number of 1 is too high to apply to fuel and light, as unlike England no fuel is required for heating purposes, and therefore an index number of 1/2 has been substituted. The food index number of course is given its full value of 7 1/2.

If the percentage of rise in cost of food, 80.5 per cent. is multiplied by 7 1/2, and that of fuel, 62 per cent. by 1/2, the result works out at 80 per cent. increase on the total.

This relates to the expenditure of a European in the country; any expenditure in England, such as that on clothing, or a married official keeping up an establishment at home, would be governed by the English figure. This on September 30th, 1922, was 78 per cent. and on October 31st, 1922, 80 per cent., so that it is reasonable to assume an all-round figure of 80 per cent. to represent the increase in the total cost of living both in the Colony and at home since 1914.

While the unemployment prevalent at home makes it probable that candidates could now be obtained for these posts at salaries lower than those in force, on the other hand unemployment is less prevalent amongst the railwaymen than in other trades, and the increases in the wages of grades such as driver, fitter and platelayer have been on English Railways in general 80 per cent. and in some instances more. Also I understand that the wages of £200 and £225 given to European platelayers and artizans before the war were barely sufficient to allow a man to maintain himself properly. This opinion I understand has the congrades of European staff were reduced below the margin of 80 per cent. over the pre-war figure it is doubtful if a suitable stamp of man could be obtained, or, if obtained, would be able to exist properly on the reduced wage.
In the higher wages, the increase on pre-war total emoluments has ranged from 65.1 per cent. down to 36 per cent., and is in all cases less than the rise in the cost of living.

From the point of view of cost of living there is no justification for lowering the salaries below a figure of 80 per cent. in advance of the 1914 rates, and this has all the more force because unlike the native or the non-native African, who have a large margin between their pay and the essential cost of living, there is little margin for the European after he has bought the necessaries of life. /  

From the point of view of supply and demand, owing to the advance in wages of railwaymen at home having been at least as large as that on the Sierra Leone Railway, it is doubtful if the same stamp of man could be obtained for lower wages than at present. Even if it was decided to reduce all wages to the level of an 80 per cent. increase, the saving would only amount to about £300 a year. This would be entirely at the expense of the lowest grades and would create an invidious distinction quite out of proportion to the advantages gained. For these reasons I do not advocate any changes being introduced at present into the scale of European wages. The policy should rather be to limit their numbers while offering sufficient inducement to the proper class of man to come forward as candidates.

121. The case of the non-native African presents more difficulty. When he is drawing a small salary his food differs little, if at all, from that of the native; as he draws more pay he eats more European food, but the staple commodities of his diet remain the same as those of the native, namely, rice and palm oil. Similarly his clothing bill varies with his pay; the more he gets the more clothing he buys.

From the enquiries I have made the minimum of his expenditure appears to be £18 a year on food and £12 a year on clothing, which, with £5 a year for rent, lighting, etc., makes a total minimum expenditure of $35 a year. Assuming that he has a wife and family and his wife is not earning any money, his minimum expenditure would be then about £65 a year.

As this refers more particularly to the salaried grades, such as clerks and traffic staff, it would be appropriate to compare it with their scale of pay. In the case of clerks the commencing salary for probationers is £50 a year, rising to £60 on appointment as a fourth grade clerk after twelve months’ service, provided the examination has been passed. From that point his pay increases £9 yearly on the scale of £60 – £9 – £96, and at the end of five years spent in that grade, provided there is nothing against him, he automatically enters the third grade on the scale of £108 – £9 – £144, so that in eleven years from his original appointment as a probationer, he should be receiving £144 a year or nearly three times his commencing salary.

The contrast between this and the minimum expenditure quoted above is very marked. It shows that the margin between the cost of actual necessities and
pay is very large indeed; for instance, a fourth grade clerk of one year’s service
draws sufficient to provide necessities not only for himself, but also for a wife;
if he has no wife he has a margin of £25, out of a total of £60, to spend on items
other than necessaries.

It would, of course, be unfair to assume a minimum expenditure figure of
£35 a year for the higher grades of clerical staff who may quite legitimately con-
sider themselves entitled to a higher standard of comfort, but the steep scale of
increments, £9 a year in the two lower and £10 a year in the two higher grades,
makes very ample allowance for this, so that, as shown earlier, after 11 years’ ser-
vice, a clerk is earning nearly three times what he received as a probationer and
over twice what he was receiving on definite appointment.

This confirms very directly the information which I received from many
sources that the scale of food and clothing of the non-native African varies much
more according to pay than is the case, for instance, in England. In proportion
as he receives more pay he deserts native produce, buys more European food and
spends more on clothes.

For this reason it is extremely difficult to fix any standard on which to base
definite calculations as to the rise in the cost of living. One / method of ascer-
taining it would be to assume that he spends half his pay on native and half on
European items. On this basis the increase works out at 62 per cent. I think,
however, this method gives too high a result, as the amount which it is necessary
for him to spend approaches much closer to the native than the European figure.

But though it is difficult to fix any figure as in the case of Europeans and
natives, it is clear from the above that the increase does not exceed 60 per cent.
and is probably considerably lower, that the scale of increments is so generous
that in eleven years the pay is doubled and nearly trebled, and that consequently
in all except the lowest grades the salaries given bear practically no relation to the
rise in the cost of living.

In the case of daily paid staff the same factors apply, though to a lesser degree.

A case is thus clearly established for a revision of the scales of pay of all non-
native African staff with a view to their reduction to figures more in consonance
with the present economic conditions.

I would recommend that a committee be formed in the Colony itself for this
purpose, as any specific recommendations which I could make could necessarily
be only general and I did not have time whilst in the Colony to examine into
each appointment and grade, as would be necessary before a final decision could
be reached.

122. I have dealt with the subject of reduction of wages at some length because
therein lies the principal hope of reducing the expenditure. I have recommended
certain definite reductions which may be assessed as in the neighbourhood of
£10,000 a year, and the adoption of methods of procedure in various depart-
Necessity for Reduction of Wages.
ments which will produce greater economy in the employment of material and men and hence result in further reductions, but these decreases of themselves even coupled with the fall in the price of materials, cannot be expected to balance the deficit on the net revenue account of approximately £150,000. I have explained in this report that there is no likelihood of such a large increase in receipts in the immediate future as would make good this deficit; the Railway is carrying and will have to carry half its goods traffic, namely, palm kernels, at the pre-war rate, while its scale of wages has gone up on the average well over 66 per cent. It is therefore clear that it must unfortunately look for a decrease in expenditure rather than an increase in receipts to balance its budget, and there is little hope of its doing this until it gets its scale of salaries back to a level more in consonance with pre-war rates. The figures which I have given above show that there is scope for considerable reduction in the two categories which between them absorb by far the largest proportion of the wages bill. Unless these reductions are effected it will not be possible to get back to results even comparable to those of 1912 and 1913, much less to an entirely satisfactory financial situation, in which the Railway is able to provide for both its loan charges and renewal costs.

123. Rigid economy must also be exercised in respect of extraordinary expenditure; in view of the urgency of the relaying programme all other objects which depend on extraordinary expenditure must be subordinated to it. All proposals for such expenditure should be rigorously excluded unless it can be proved that the public safety will be endangered if the funds are not provided, or that the projects are likely to return an early profit commensurate with the expenditure.

124. Before leaving the subject of finance, reference must be made to the question of renewals and replacements. In common with other Colonial Railways, the Sierra Leone Railway makes no yearly provision / towards depreciation. In principle, replacements are effected out of revenue as they become necessary. The present is an excellent example of the dangers of that policy. In the first fifteen years or so of the life of a railway the sums required to replace items worn out is very small; it is only afterwards that the burden makes itself felt. The Railway is now 18 years old, and so far such renewals as have been necessary have been effected out of Colonial revenue, as, for example, four tank engines and four boilers in the year 1920. The Colony is also financing the £36,000 required for relaying in 1923 from the same source, but a call for so large a sum at a time of such financial stringency must necessarily throw a heavy burden on the Colony’s resources. Practically the whole of the cost of the renewals has to be met at a time when the Colony is least able to bear it. If a renewals fund had been in operation from the start, the years of comparative prosperity would have contributed their quota, and it would not have been necessary to find the whole cost out of the revenue of two or three years.
In existing circumstances, it would be absurd to recommend the institution at present of such a fund, because after the present two years’ programme of relaying has been completed other items such as locomotives, carriages and wagons, etc., will be getting worn out and the cost of replacing them will have to be debited to revenue. But as soon as the financial situation permits I would urge most strongly that a proper renewals fund should be started; the contributions to this should be included in the Annual Estimates and be budgetted for in the same way as any other items of working expenditure.

The sums calculated on present prices which should be set aside annually are given in the following Table No. F/4. These figures would, of course, alter yearly as assets were added or struck off.

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
<th>Contribution</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings –</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi-permanent</td>
<td>46,761</td>
<td>5</td>
<td>2,338</td>
</tr>
<tr>
<td>Permanent</td>
<td>99,000</td>
<td>1 1/2</td>
<td>1,485</td>
</tr>
<tr>
<td>Bridging and Permanent Way</td>
<td>500,000</td>
<td>3 1/3</td>
<td>16,666</td>
</tr>
<tr>
<td>Plant</td>
<td>38,838</td>
<td>6 2/3</td>
<td>2,389</td>
</tr>
<tr>
<td>Locomotives</td>
<td>131,900</td>
<td>4</td>
<td>5,276</td>
</tr>
<tr>
<td>Rolling Stock</td>
<td>336,360</td>
<td>4</td>
<td>13,455</td>
</tr>
<tr>
<td>Totals</td>
<td>£152,859</td>
<td>–</td>
<td>£41,609</td>
</tr>
</tbody>
</table>

The present yearly contribution would thus be approximately £42,000, and the course which I would recommend should be adopted is that, as soon as the finances of the Colony permit, the difference between this figure and that actually included in the Estimates for definite works of replacement which are going to be undertaken during that year should be included in the Estimates and placed to a separate renewals fund. As the capital replaceable assets of the Railway increase, the yearly contribution would have to be increased proportionately, and the percentage as shewn against the various classes would have to be allowed on account of these additions.

125. In this report generally, I have dwelt on the importance of administering the Railway as far as possible on the lines of a commercial concern. Through dint of competition commercial undertakings have been forced to evolve the most efficient and economical methods for the conduct of their business; it may not always be possible in a state undertaking to adopt these in their entirety, but it is certain that the further they are departed from the greater will be the loss in efficiency and economy. In actual practice, it will be found that the occasions
when such departures are necessary will be few, provided that the principle that the State Railway is a commercial concern is not only recognised in theory as at present but is applied in practice, both by the Railway itself and the Colony.

Even a case like the Mountain section, which has been built for administrative purposes, should be regarded from the commercial standpoint which they have to maintain even though they are doing so at a loss, but they take care to know what it is costing them to maintain them, and run them so as to keep that loss as low as possible.

I am not contending that a colonial railway should strive to make as large a profit as possible. That is a matter of policy to be decided by the owners of the Railway, the Colony and its Government. They can decide if they like that the Railway shall make no profit at all; but it is the duty of the Railway administration to run the Railway in accordance with the policy laid down to them as economically as they can, and so as to ensure the greatest amount of net profit. They must also be in a position to inform the Government as to the actual and complete financial results of the undertaking. To carry out these duties it is essential not only that the methods of management, operation, finance, accounting, etc., should be assimilated as closely as possible to those in use on privately owned railways on the lines indicated in the recommendations made in this report, but that the Railway itself must view all questions from the commercial standpoint and should be encouraged by the Government to adopt that attitude in all the problems which it has to face. /

[...]  

**Report**  
ON THE  
RAILWAY SYSTEMS OF KENYA,  
UGANDA AND TANGANYIKA.  
BY  
LIEUTENANT-COLONEL F. D. HAMMOND, C.B.E., D.S.O.,  
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*Special Commissioner for Railways, Eastern Africa.*  
Part II – TANGANYIKA.  
Part III. – FUTURE DEVELOPMENT.  

PUBLISHED BY  
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LONDON, S. W.  
1921  
[...]
REPORT

ON THE

RAILWAY SYSTEM OF TANGANYIKA.

CHAPTER I. – INTRODUCTORY.

207. The Railways in Tanganyika Territory consist of the Central Railway from Dar-es-Salaam to Kigoma on Lake Tanganyika, and the Tanga Railway from Tanga to Moschi. The latter is connected from Kahé, 332 kilometres from Tanga, to the Uganda Railway by a military railway built during the War, and joining with the latter at Voi.

208. The construction of the Central Railway was originally commenced in 1905 by a German private company, the Ost Afrikanische Eisenbahn-Gesellschaft (O.A.E.-G),1 to whom land and mining concessions were granted. This Company constructed the line as far as Morogoro, kilometre 202, and ran it as a private concern. The German Government decided in 1908 to extend the Railway; it bought up 88 per cent. of the capital of the company, and supplied all capital funds required thereafter for extensions. The O.A.E.-G. was kept in existence to run the Railway, but the land concessions, other than those directly attached to the Railway itself, and the mining concessions were transferred to another private company, the Ost Afrikanische Land-Gesellschaft (O.A.L.-G.), which remained thereafter quite distinct. The Railway itself was completed shortly before the War, and a branch was commenced in 1914 from Tabora, kilometre 841, in a north-westerly direction towards the Kagera River, via St. Michael. About 40 kilometres of this had been completed before the War, but 29 kilometres of the rail were picked up and used by the Belgians in continuing the Katanga Railway to the Lualaba, the sleepers being stacked at Tabora.

The standard of construction of the Central Railway is high. From Dar-es-Salaam as far as kilometre 225 the rail used is of a section weighing 42 lb. to the yard, but from there to Kigoma, kilometre 1,244, a 56 lb. rail of German section

Central Railway.
is used. The heavier rails and sleepers are of excellent design; the line is fully ballasted throughout, except between Tabora and Kigoma. Between these points sufficient ballast to complete up to full section was stacked along the line, and is still available.

The alignment now in use is the final one, as re-aligned by the Germans, except at kilometre 164, where, owing to one of the bridges demolished during the War not having yet been repaired, the original alignment is used.

The maximum gradient throughout is 2 per cent., compensated, in both directions. The maximum radius of curvature is 300 metres, except on the temporary diversion noted above.

The buildings are of solid construction, generally of stone, the larger station premises being double-storeyed, with quarters for the European staff in the upper storey.

From Dar-es-Salaam to Kilossa, kilometre 283, cotton and sisal are grown, and the traffic prospects are good; from Kilossa to Igalula, kilometre 805, except for a few local requirements round Dodoma, the prospects of traffic along the route are poor, the country being mostly bush, and full of tsetse fly. There are fertile areas to the North and South, but they are a considerable distance from the Railway, and cut off from it by 'fly' belts. From Igalula there is a zone of about 100 kilometres to Usoki, kilometre 902, which is fertile and capable of producing traffic. This zone includes Tabora. From Usoki the country again becomes fly-ridden, until within 16 kilometres of the terminus on Lake Tanganyika, kilometre 1,244, the only traffic from the Usoki-Kigoma section being from the salt mines at Nyanza.

The Germans, in fact, in the choice of a route, kept as their sole idea, the easiest line from Dar-es-Salaam to the Lake, traffic possibilities en route being an entirely secondary consideration. The Revenue Account of the Railway prior to the War showed a favourable balance, but this was solely due to the carriage of stores and material for new construction.

The present service of trains is 1 passenger and 1 goods train per week in each direction between Dar-es-Salaam and Kigoma, and 1 mixed train per week in each direction between Dar-es-Salaam and Tabora. In addition, a water train has to be run throughout the line weekly.

209. The Tanga Railway – or, as it was then called, the Usambara Railway – was also commenced originally by a private company. When this got into difficulties the German Government stepped in and took the Railway over, ultimately leasing the line to another private company, the Deutsche Kolonial Eisenbahn Bau-und-Betriebs Gesellschaft, who also were placed in charge of the extension to Moschi, and acted as contractors for the construction.

The first 91 kilometres of this line were laid in a 31 lb. rail, the remainder being 40 lb. Although not up to the same high standard as the Central Railway,
the buildings and construction as a whole are good and substantial, the former being distinctly superior to those on the Uganda Railway.

The maximum gradient is 2.5 per cent. in both directions, and compensated for curvature. The radius of the sharpest curve is 300 metres.

The characteristics of the Tanga Railway, its traffic possibilities and future were discussed in my report on the future of the Voi-Kahé Military Railway, which forms Appendix I. to Part I. of this Report.

The Voi-Kahé Military Railway is for administration purposes regarded as a branch of the Tanga line, and the total kilometrage of the two together is 503; 1 through passenger and 1 goods train a week are run in each direction. The Tanga Railway possesses its own workshops at Tanga, and all Departments of the Railway, including the Accounts, are represented on it.

There is no official, however, appointed to superintend all the services on that line, and any question affecting more than one Department has to be referred to Headquarters at Dar-es-Salaam. The indifferent communications between Tanga and Dar-es-Salaam render such administration difficult and tedious.

210. All the Railways, except the Tabora-Kigoma section, were handed over from the British Military to the Civil Administration on the 1st April, 1919. The physical damage done to the lines had not yet been made good; all efforts had naturally been concentrated on military objects, and the Railway service was regulated with that view. Maintenance of buildings and track was only carried out in so far as it was necessary for those objects, and the work of all the Departments, including the Accounts and Stores, was governed quite rightly by the same principle. Consequently, the Civil Administration, when it took over, had not only the task of straightening out the confusion consequent on the War, but also had to build up a working organization suitable for peace conditions. This task was not simplified by the fact that a permanent appointment to the post of General Manager was not made until late in 1920. / The section Tabora-Kigoma was only handed over in April of the present year by the Belgians; both the track and equipment, when handed over, were in bad condition.

The peace-time organization is thus gradually emerging, and the Railway are still striving to get it into proper working order. In any conclusions as to the methods of administration, allowance must be made for this, especially in any comparison with other Railways, which although they may have been severely tried during the War, have had the advantage of a working organization for many years previously.

211. The Estimates for 1921–22 were originally drawn up in October, 1920, when trade was good, and it was hoped that money would be available for development. As conditions in these respects have changed, it has become necessary to cut down the Estimates to the barest essentials compatible with running the
traffic now in sight, without any allowance for development. The recommendations as to staff and administration which I am putting forward in this Report have been based on this principle.

The majority of these recommendations have already been communicated by me to the General Manager; I understand some of them have already been put into force, and the Estimates now being framed in the Territory are being drawn up generally in accordance therewith.

212. Metric standards were employed by the Germans. It would entail considerable expenditure in re-chaining, purchase of new weighing machines, &c., if these standards were changed, and they have consequently been adopted. It has therefore been necessary to use them in this Report.

CHAPTER II. – TRAFFIC DEPARTMENT.

213. The organization of the Traffic Department is on a district basis; under the Traffic Manager are 3 District Traffic Superintendents, stationed respectively at Morogoro, Tabora and Tanga. In addition, an Assistant Traffic Superintendent is allocated to each district and one to the Traffic Manager’s office. On a line like the Central Railway, over 1,200 kilometres long, it is necessary to have two districts despite the smallness of the traffic. The limited time table, in fact, renders communication and inspection still more difficult, and so reduces the effective work which officials can perform in a given time. It is also necessary to allocate one assistant to each district in order to allow for inspection. To inspect the stations properly under the existing time table entails an absence from Headquarters of at least ten days, during which time the current work of the office has to be performed, and, with the inferior class of staff employed, frequent inspection is essential.

I consider that the establishment actually at work on the Central Railway should consist of two District and two Assistant Traffic Superintendents.

On the Tanga Railway one District and one Assistant Traffic Superintendent are at present allowed. The staff required in this case will depend on the policy adopted as regards this Railway and the Voi-Kahé connection. If the policy recommended by me in Appendix I., Part I., of transferring the administration of the Voi-Kahé line, when reconstructed, to the Uganda Railway and of pulling up the section of the Tanga Railway beyond kilometre 283 is adopted, the Tanga Railway will be only 283 kilometres long, and the traffic can be adequately supervised by an Assistant Traffic Superintendent. Until that takes place the importance of the work justifies the appointment of a District Traffic Superintendent, but I do not think he will need an Assistant in addition.
For the Head Office an Assistant Traffic Superintendent will be required in addition to the Traffic Manager to take charge of the office during the absence of the latter on inspection duty and as general assistant.

The actual establishment thus required at work on the whole system will be 1 Traffic Manager, 3 District Traffic Superintendents, and 3 Assistant Traffic Superintendents, or, when the Tanga line has been reduced, 1 Traffic Manager, 2 District Traffic Superintendents and 4 Assistant Traffic Superintendents, a total of 7 in both cases.

This figure of seven traffic officials at work on the system at the same time appears large at first sight, when compared with the volume of traffic moving, but it is difficult to see how it can be further reduced without interfering with adequate inspection. At the same time, this number could cope with a traffic several times larger than the present. It is one of the unfortunate characteristics of railway working that when traffic is small it is impossible to reduce superintending staff in proportion, and the present case affords a typical example.

To this figure of seven it will be necessary to add 2 Assistant Traffic Superintendents to allow for leave, making a total of 9 in all, as against 11 as shown in the original Estimates for 1921-22. The actual numbers employed at present are 1 Traffic Manager, 3 Districts Traffic Superintendents and 6 Assistant Traffic Superintendents, or 10 in all; under the arrangement recommended it will be necessary to terminate the appointment of one of the Assistant Traffic Superintendents.

214. I do not consider that the present location of the Headquarters of one of the Traffic Districts at Morogoro is very suitable. The most important station in this Districts is Dar-es-Salaam, and the District Traffic Superintendent should be stationed there, in order to keep in touch with the requirements of the public. Otherwise, there is a danger that the detailed traffic working will gradually drift into the hands of the Head Office, who should not be interfering in details. The Head-quarters of the District should therefore be moved into Dar-es-Salaam, as soon as the housing question permits.

The Assistant Traffic Superintendents should similarly be moved to the Headquarters of their respective Districts; their duties should be strictly to assist the District Traffic Superintendents; if stationed elsewhere, there is a tendency for a staff and a system of correspondence to spring up around them.

On the whole, the principle of district organization is well maintained. Up-to-date, no powers to settle claims have been delegated to District officials, but the intention is ultimately to give them powers to settle claims up to 100 florins. I am in agreement with this, but consider that the Traffic Manager’s office should first lay down general rules for guidance, and should scrutinise all claims thus paid in order to preserve uniformity between districts.
215. The stationmasters at the five principal stations on the Central Railway, Dar-es-Salaam, Morogoro, Dodoma, Tabora and Kigoma, are Europeans. There is also a European stationmaster at Tanga. The stationmasters at the remaining stations are all Asiatics with the exception of one African.

The capabilities of the majority of the Asiatics are distinctly inferior; I have noted in my Report on the Uganda Railway that of recent years the men recruited from India have shown a marked falling away from the standard previously obtainable. This inferiority is still more noticeable on the Tanganyika Railways, because the whole staff has only been recruited comparatively recently.

The whole of the signalling staff, on the other hand, with one exception, is African, and it is the policy of the Administration to train the local natives, in order to avoid any necessity for importing such staff. A commencement has already been made, stationmasters being given grants for trained Africans turned out by them. With this policy I entirely agree for the reasons given in Part I. of this Report. The aspect of the question as it affects Tanganyika and the steps which have already been taken are more fully dealt with in Chapter VII. on Staff Questions.

As explained earlier, the Estimates for 1921-22 were drawn up in respect of better traffic and development; there is now, however no necessity for some of the additional posts amongst the subordinate staff allowed for therein. Considerable reductions will be possible in respect of the junior traffic ranks, and I understand these will be shown in the revised Estimates now in course of preparation. Very little actual saving, however, will result, as the majority of the vacancies had not been filled.

216. The inspection of stations appears to receive good attention, the District Traffic Superintendents averaging about 15 days out of the month on inspection duty, and the Assistant Traffic Superintendents the same. I do not consider, however, that District and Assistant Traffic Superintendents pay sufficient attention to obtaining information about future traffic possibilities. As most of the crops are native grown the Traffic officials should make it their business to keep in close touch with the Political Officers, and ascertain from them the crop prospects and the possibilities of developing new traffics. By this means they can keep the Traffic Manager posted as to what the requirements of traffic are likely to be, and in what direction it may be possible to stimulate it.

217. The small amount of traffic running allows little latitude in operation, or scope for improvement.

The working time table is based on an average speed of approximately 25 to 30 kilometres, or 15 to 19 miles per hour. The distance between crossing stations has been increased recently to as much as 60 to 65 kilometres in certain cases, with a view to cutting down staff.
Wood fuel is used, but, instead of the fuel being collected by fuel trains, the traffic trains stop in section at the points where the fuel is collected, and load up. This obviates the necessity for running fuel trains, but is only possible so long as there is little traffic.

The ordering of trains, as on the Uganda Railway, is left in the hands of the District Stationmasters, daily stock reports being forwarded from stations to the District Stationmaster and the Traffic Manager’s office. Where only 1 mixed and 1 goods train are run once a week in each direction, it is obvious that a good turn-round of trucks is impossible; loaded trucks at intermediate stations must wait until there is a train to take them. However excellent the control of traffic and trucks might be, no material change could be effected so long as the traffic remains so small. Nevertheless, I am of opinion that it would be advisable to centralize the ordering of trains so that, although for the moment no great result may be expected, the more suitable system may be in working order in readiness for any increase of traffic. I therefore recommend that train ordering and truck control should be centralized in the Traffic Manager’s office on the lines described in para. 18, Part I. The same general conditions regarding the rendering of stock reports should be established. In this case, the amount of work entailed would not necessitate a separate section being established to deal with it for the present.

The loading of trucks appears satisfactory; this is helped by the method of charging for consignments of not less than a truck load. In the Tariff Book classification, goods for which wagon-load rates are quoted are also classified A, B, and C, according to the minimum weight of a truck load. Goods in category C are considered as capable of being loaded up to the full carrying capacity of a truck, those in category B as up to 80 per cent. of the carrying capacity, and those in category A as up to half the carrying capacity. For example, pressed cotton is in category B; when a trader dispatches a consignment of pressed cotton at wagon-load rates, the weight on which the charges are computed is 80 per cent. of the total carrying capacity of the wagon loaded. It is therefore to the trader’s interest to get the best load into the wagon, and overloading, rather than underloading, has to be guarded against. For the benefit, however, both of the station staff and traders, I think it would be advisable to issue to stations diagrams showing the best method of loading the more general commodities, such as cotton, sisal, ground nuts and country produce, into the various types of trucks.

218. Traffic is worked on the line clear and caution message system, either by telegraph or telephone. Such a method admittedly does not offer a high measure of security, but until the system has passed through the ‘pioneer’ stage, and is carrying a paying traffic, it cannot afford a high standard of safety.
The situation is quite different from that existing on the Uganda Railway; on the latter the number of trains run is about four times as great as on the Tanganyika Railways; further, the arrangements for working traffic on the Mombasa-Nairobi section, the only one on which I had occasion to comment, have been allowed to fall below the standard in force prior to the War. On the Tanganyika Railways the question is whether expenditure should be incurred in installing a better system than has been used formerly. In the present stage of the development of those Railways, I would not feel justified in making such a recommendation. / 

The instructions to the staff are contained in a Rules Book and Traffic Working Orders which were brought out during the military occupation. These are incomplete in certain respects, and on the other hand contain matter which is no longer applicable. A new book to comprise both is now in course of preparation, and will be issued as soon as completed. 

219. The regulations for the reporting of accidents by the Railway to the Government do not appear to be clearly defined. I have explained in para. 22, Part I., the reasons on account of which I consider it desirable in the interests of public safety that the enquiries into serious accidents should not be limited to those held by the Railway Administration, and similarly in this case I recommend that all accidents Class B, i.e., those resulting in serious damage to property, but not loss of life, or injury to persons, should be reported to the Governor, who may, if he sees good cause, convene an independent enquiry, and that in the case of accidents Class A, i.e., those resulting in loss of life or serious injury to persons, it should be the invariable practice of the Governor to convene an independent enquiry. A technical railwayman should be appointed either as a Member of the Court or as technical adviser. These enquiries should be quite distinct from the ordinary Coroner’s inquest.

220. The Railway telegraphs and telephones consist of one telegraph line, tied in at about every third or fourth station to take service messages, and a station to station telephone line for train working. These appear adequate for the traffic.

The maintenance of the lines and instruments is in the hands of the Postal Department; as the Railways were not satisfied with the results, they had brought the matter to the notice of the Postal Department prior to my arrival. Conferences were subsequently held between the two Departments as a consequence of which it is hoped to put such measures into force as will satisfy the Railways’ requirements.

221. Train-kilometrage and vehicle-kilometrage statistics are compiled in the District Stationmasters’ offices from the guards’ journals, and forwarded to the Traffic Manager’s office direct, where the figures for the whole system are com-
Commodities carried are prepared monthly by stations and compiled in the Traffic Manager’s office. The results are available shortly after the end of the month. The only change which I would recommend is that the returns from the District Stationmasters should go first to the District Traffic Superintendents’ offices, and the figures for the District be worked out before submission to the Traffic Manager.

The only traffic statistics maintained by the Accounts Department relate to passengers, tonnage, and passenger and ton kilometrage. The general system of statistics appears simple and prompt.

One of the disadvantages under which the Traffic Department has had to work is the great variety of forms and returns which have been left as a legacy by the Military Administration. During the military occupation the forms required, for example, for goods and coaching balance sheets, muster rolls, &c., were obtained from various Indian Railways. Thus, forms for the same purpose were obtained from two or three different railways; the forms themselves usually differed considerably, and seldom suited the requirements of the Tanganyika Railways. In certain cases forms had to be used for purposes for which they were never intended. These returns and forms are gradually being worked off, and replaced by those drawn up by the Railways, as the limited capacity of the Government Press allows. But there is no doubt that it has been, and still is to a certain extent, a distinct obstacle to the proper rendering of returns and statistics.

222. The salary sheets for the whole Central Railway are made up by the Traffic Manager’s office from muster rolls submitted direct from stations. It would undoubtedly be more in keeping with the district organization if the salary sheets were prepared in the District offices, but it would mean an increase in clerical staff. Also, owing to the large amount of sickness recently, and the consequent numerous changes of staff between District, it has been found simpler to concentrate the work at Headquarters. I am of opinion, therefore, that the present arrangement should continue, but costs and expenditure for districts should be worked out and issued. Owing to the absence of a proper price list and to the arrears in the Accounts Department, it has been impossible to get out approximate monthly costs; as soon as the accounts are in proper working order and a proper price list is issued, costs per unit, both for the whole system and for Districts, should be worked out and be available within two weeks of the end of the month.

The salary sheets for the Tanga Railway are compiled at Tanga; it has been impossible, owing to arrears in the accounts, and the absence of a price list, to get out costs of working, but in this case also when these matters have been straightened out monthly returns of approximate expenditure should be made.

223. The system of consigning and invoicing goods is framed on the Indian model, but is simpler than that employed on the Uganda Railway.
The consignor hands in a consignment note on the form prescribed by the Railways. This is retained by the despatching station, and from it an invoice in triplicate is prepared. One copy is handed to the consignor, one copy is sent with the goods and the third is retained in the book at the despatching station, consignment notes being pasted into it. At the receiving station the goods are retained until the consignee hands over the copy of the invoice which has been given to the consignor, and which the consignor is supposed to have sent by post to the consignee. This copy of the invoice is retained by the receiving station, who forward to the Accounts Department with the goods abstract the copy which was originally forwarded with the goods. If the consignee cannot produce the copy of the invoice he can obtain possession of the goods by signing an indemnity form, provided that the stationmaster is satisfied that he is the rightful consignee.

The disadvantages of this method, as detailed in para. 27, Part I., are the time consignors are kept waiting, the congestion in sheds and liability to pilferage, the heavy expenditure in stationery and the uncertainty of the consignee as to time of arrival. In the case of the Tanganyika Railways the absence of the fourth copy of the invoice, which on the Uganda Railway is sent direct from the despatching station to the Accounts Department, reduces the amount of checking necessary in the Accounts Department, and also to a certain extent the amount of stationary used. Congestion in the sheds is also not so important a factor at present as traffic is so small; but the other disadvantages remain, and when the traffic increases the disadvantages of congestion will also be felt. I therefore recommend the adoption of the system proposed for the Uganda Railway in paras. 27 and 114, Part I., in which consignment notes in duplicate and advice notes are used.

224. Parcels are consigned and invoiced in a similar manner to ordinary goods traffic although the forms are slightly different from those in use for goods. The items involved are nearly all small sums of one or two florins each; the ordinary goods procedure is too complicated for such small sums, and I recommend, as in the case of the Uganda Railway, vide para. 28, Part I., that the stamp system should be introduced. It is admitted that the same perfection of check cannot be obtained under the stamp system, but the saving of clerical labour, not only in the stations, but in the Accounts Department, compensates for any small losses which may occur.

225. Until April 1st, 1921, the Tanganyika Railways accepted traffic only at Owner’s risk; on that date they announced that they were prepared to accept traffic at Railway risk; for this purpose the rates in the Tariff Book are taken as being at Owner’s risk, and 20 per cent. is added for Railway risk. On the Voi-Kahé Military Railway no goods are accepted for carriage at Railway risk, owing to the nature and condition of the Railway.
The conditions of carriage at Railway risk are identical with those in force on the Uganda Railway, as also is the risk note which the consignor has to sign in the case of packages defectively packed or in bad condition, holding the Railways free from all responsibility for the condition in which the goods may be delivered.

For carriage at Owner’s risk the risk note is also similar, with the exception that whereas the Uganda Railway risk note frees the Railway from responsibility ‘except for the loss of a complete consignment or of one or more complete packages forming part of the consignment, due either to the wilful neglect of the Railway Administration or to theft by or the wilful neglect of its servants during transit over the said Railway, provided that the term ‘Wilful neglect’ be not held to include fire, robbery from a running train, or any other unforeseen event or accident,’ the Tanganyika Railways’ risk note limits this liability to the loss of a complete consignment, and omits all reference to the loss of one or more complete packages.

The conditions for the carriages of ‘Excepted articles’ are identical.

Both Owner’s and Railway risk rates are quoted on all goods except in the case of ‘Excepted articles’ and ‘dangerous goods,’ which are of course governed by special regulations.

As no steamers are administered by the Railways, the necessity for special conditions for carriage on steamers has not arisen.

Probably owing to the smallness of the traffic, I received very few complaints as to pilferage and breakage. The small quantity of traffic handled not only means that the amount of pilferage is proportionately diminished, but it further reduces the opportunities, because it can be checked and prevented better when sheds are empty, and there are few people about. Also, owing to there being no large commercial centre up-country, such as Nairobi, pilferage which has occurred on ships before arriving in the country is usually discovered before the goods are put on rail. It is therefore not fair to draw any comparison between the two cases, and the comparative immunity of the Tanganyika Railways should be attributed to the particular circumstances rather to any innate perfection of the system.

I agree that the conditions existing on the Voi-Kahé Military Railway are not such as to permit the Railway to take the full responsibility for goods, as defined under the term ‘Railway risk.’ This Railway was built purely for military reasons, and reconstruction is necessary before it can be considered as suitable for peace-time traffic. Until the reconstruction has been carried out it would be unfair to expect the Railway to assume the full responsibility.

As regards the Owner’s risk conditions, I do not see any adequate reason why the liability of the Railways in respect of the wilful neglect of the Administra-
tion or the theft or wilful neglect of its servants should be limited to the loss of a complete consignment.

The effect of this would be that, for example, in a large consignment, provided the Railways could hand over a single package, they could disclaim all responsibility, even though it might be clearly proved / that the whole of the rest of the consignment had been stolen by the Railways’ servants. This is distinctly harsh on the consignor, and I recommend that the conditions should be amended and the words ‘or for one or more complete packages forming part of the consignment’ should be added in the Owner’s risk note after the words ‘loss of a complete consignment.’

I have drawn attention in my Report on the Uganda Railway to the system of only quoting Railway risk rates for the higher class traffics. The object of this is to ensure that the Railways have a direct interest in seeing that no pilferage or breakage occurs to the more valuable traffics, whilst in transit. Under the Owner’s risk conditions the Railways are not responsible for either and have little incentive to guard against them. The principle is already in force on the Uganda Railway, and the Traffic Manager informs me that he considers that it has had good results, as the staff undoubtedly pay more attention to goods at Railway risk than they do to goods at Owner’s risk. In the tariff which I have framed for that Railway, I have extended this principle to include all articles in the three highest classifications. The same principle is in force also on the South African Railways and the Beira and Mashonaland and Rhodesian Railways. I recommend that it should be applied to the Tanganyika Railways, and that goods in the two highest classes, namely the first and second, except ‘excepted articles,’ should only be accepted at Railway risk, and that the rates quoted for this should be the same as in the present Tariff Book for Owner’s risk.

In the remaining classes the present difference of 20 per cent. between Owner’s and Railway risk appears excessive. The extra responsibility assumed by the Railways in respect of the safety of the articles carried cannot be considered as justifying an extra charge as high as 20 per cent. I am of opinion, that, as in the case of the Uganda Railway, the increased liability is adequately met by charging 10 per cent. on the Owner’s risk rate, and recommend that the existing charges in the Tariff should remain as those at Owner’s risk, and that Railway risk should be 10 per cent. in excess of these.

226. Up to date, ledger accounts for payment of traffic charges have not been instituted. The Belgian Congo Government and one or two of the principal firms are allowed to use the same form of warrant as the Government. These warrants are subsequently redeemed by cash payments. This system has worked all right during the initial stages, but it is not so satisfactory as a proper ledger account. No bond is obtained from the merchant as a guarantee of payment, and should any firm ask for similar treatment it would be difficult to refuse, whatever
might be the standing of the firm, without suspicion of discrimination. There is also the danger of misuse of warrants by subordinate clerks in the firm. For these reasons I recommend the adoption of the ordinary ledger account system, with guarantees from the firms in the shape of bonds.

In the case of the Belgian Congo Government, the necessity for a guarantee might be waived.

227. The passenger traffic, consisting as it does of only 1 mail and 1 mixed train per week each way, is easy to handle and calls for no comment. I received no complaints from the public on the score either of accommodation or cleanliness.

On the Central Railway catering on the mail train is carried out by means of a dining car; no arrangements are at present made for catering on the mixed train, but a bogie dining car is now being built for use on the mixed train, and, when that is in service, the 4-wheeled coach now in use on the mail train will be transferred to the mixed. A 4-wheeled dining car is also being fitted up for the Tanga Railway. / The passenger traffic.

The catering is let to a contractor who now pays £10 a month for the right on the Central Railway, and will pay £5 a month on the Tanga Railway. When the new bogie coach is put into service on the Central Railway a fresh contract will be entered into which should give a higher return than the present one of £10 per month.

The price for each meal is 2 florins. The charges generally appear reasonable and the meals good.

The receipts from the restaurant car contracts should be kept in a separate fund which should be debited with the maintenance and repairs of the vehicles and depreciation charges. /

CHAPTER III.—LOCOMOTIVE DEPARTMENT.

228. The German Government intended to move the Headquarters and central establishments of the Central Railway from Dar-es-Salaam to Tabora, and had already made a move in that direction by erecting workshops at Tabora, instead of extending the existing ones at Dar-es-Salaam. In addition, there are workshops at Tanga for the Tanga Railway, so that the Tanganyika Railway system as it exists to-day has three separate sets of repair shops. This affects the organization of this Department considerably.

At the time of my inspection the Department was organized into three Districts with Headquarters at Dar-es-Salaam, Tabora and Tanga respectively. The District Locomotive Superintendent at Dar-es Salaam was in charge of locomotive running between Dar-es-salaam and Itigi, with running sheds at Dar-es-Salaam, Dodoma, Morogoro and Itigi. The workshops at Dar-es-Salaam also come under this District, and the shed at Dodoma is fitted with a small...
workshop. An Assistant Locomotive Superintendent was stationed at Dodoma, and there were locomotive foremen in charge of running at Dodoma and Dar-es-Salaam, as well as a European night shedman at Dodoma.

Under the District Locomotive Superintendent, Tabora, who is in charge from Itigi to Kigoma, were two Assistant Locomotive Superintendents, one stationed at Kigoma and one in charge of the shops at Tabora. Locomotive foremen in charge of running were posted to Kigoma and Tabora.

At Kigoma the Germans installed a workshop, which, although small, was very complete and well-equipped. These workshops were evidently intended for the repair of craft on the Lake as well as of locomotives; at present there is no work for them and they are never used.

The locomotive arrangements on the Tanganyika Railway were under a District Locomotive Superintendent, having under him an Assistant Locomotive Superintendent. In this District are included, besides the shops at Tanga, the saw-mills at Sigi, the Superintendent of which was responsible to the District Locomotive Superintendent at Tanga.

229. The number of engines on the Central Railway is 53. Of these, 13 were taken over from the Belgians at the same time as the Tabora-Kigoma section; of these 5 are in such bad condition that they are not worth repairing, and the remaining 8 are all in need of extensive boiler repairs as well as heavy repairs to motion etc. In some of the engines there were over twelve inches of sediment in the water space.

Of the 40 engines which were in the possession of the British prior to the taking over of the Tabora-Kigoma section, 29 were in fair running condition at the time of my inspection, 8 were under repair and 3 were waiting repairs.

Under the policy of not expending any sums in anticipation of development or increased traffic, the actual number of 53, or, excluding the 5 worn-out engines at Kigoma, of 48 engines is in excess of requirements. On the four sections between Dar-es-Salaam and Tabora, where the time table shows 4 trains a week each way, 3 engines for each section should suffice to carry out the work, and on the sections between Tabora and Kigoma, 2 engines for each section. To this total of 16 engines should be added a spare engine at each centre, Dar-es-Salaam, Dodoma, Tabora and Kigoma. This gives 20 engines for service on the road or in case of unexpected breakdown. Adding to this a shunting engine for use at Dar-es-Salaam and one at Kigoma raise the total to / 22.

22. Allowing 1 engine under general repairs for every 12 on the road, which permits a general overhaul to every engine once in two years, means an addition of 2 engines always in the shops. The total, thus arrived at, of 24 engines should suffice for all requirements of the present traffic including shunting.

The policy which I recommend should be followed is that the 24 engines which are now in the best condition and of the most suitable types should be
chosen for the current work of the Railway. The remaining engines should be laid up and no attempt should be made to repair them or get them into proper working condition until the prospects of increasing traffic warrant an increase in the general stock of 24. In this way the expense of putting the remaining 24 in thorough repair will be deferred until there is a justifiable expectation of their being required on the road. The same policy should be pursued with regard to wagons.

In these estimates no allowance has been made for any increase in the traffic from the Belgian Congo. When there is a reasonable prospect of obtaining more traffic from this source, extra engines and rolling stock should be repaired and put into service to cope with it. Under the Convention of the 16th March, 1921, the Belgians have the right to put their own wagons on the road, provided they are of approved design, but it is to the interests of the Railway Administration to employ their own stock, especially when they have a surplus.

The question as to the best course to be adopted in the event of the Belgian traffic exceeding that which the present total stock of engines and wagons can handle is dealt with in Chapter X. In either event it would be advisable to obtain from the Belgians a guarantee of a minimum traffic.

On the Tanga Railway the situation is complicated by the presence of the light rail on the lower section, which limits the use of the heavier engines, and also by the uncertainty of the future of the Railway. The same policy in general, however, should be pursued; the number required to haul the existing traffic, with a margin for unexpected breakdown and general repairs, should be determined, and the remainder should be laid up until such time as an increase in traffic warrants their being repaired and put on to the road.

230. The reduction of the number of engines in the sheds would entail a reduction in the running staff; at present the high proportion of time spent by this staff’s space’ is marked. It would also allow a reduction in the numbers of the senior superintending staff.

The establishment of senior superintending staff laid down in the original Estimates for 1921–22 was:–

1 Chief Mechanical Engineer;
3 District Locomotive Superintendents;
1 Workshops Superintendent;
7 Assistant Locomotive Superintendents.

At the time of my inspection the post of Workshops Superintendent was vacant, but on the other hand there were 8 Assistant Locomotive Superintendents on the books in lieu of 7.

I consider the retention of Assistant Locomotive Superintendents at Dodoma and Kigoma unnecessary. The work at neither place is sufficiently important to
justify an Assistant Locomotive Superintendent as well as a Locomotive Foreman.

I think an adequate establishment for the policy detailed above would consist of:

1 Chief Mechanical Engineer;
3 District Locomotive Superintendents (1 each at Dar-es-Salaam, Tabora and Tanga);
5 Assistant Locomotive Superintendents (1 each at Dar-es-Salaam and Tabora, 1 in the Chief Mechanical Engineer’s office, and 2 on leave),

or a total of 9, as against the present establishment of 12. I recommend that the establishment should be reduced accordingly by terminating, as they fall due, the agreements of those in excess whose services can best be dispensed with.

If the Tanga Railway is reduced to a total length of 283 kilometres, I think the presence of a District as opposed to an Assistant Locomotive Superintendent will still be necessary owing to the presence of the workshops, and the difficulty of communicating with Headquarters, which will render it essential to have an experienced official in charge.

231. The general arrangements for returns and statistics appear simple, while on the whole they are well adapted to the requirements. The salary sheets are compiled by Districts and submitted direct to the Accounts Department; monthly returns of train and engine kilometrage statistics are also compiled by Districts and forwarded to the Chief Mechanical Engineer’s office. The only alteration which I would suggest is the abolition of the return of train kilometrage every 10 days; the monthly return from Districts at present contains full particulars of the kilometrage run by each driver and engine, and the stores consumed, and contains all the information that the Chief Mechanical Engineer requires.

Owing to the arrears in the Accounts Department and the absence of a proper price list, it has not been possible up to date to ascertain costs of working per unit. The Chief Mechanical Engineer informs me that as soon as the arrears of accounts have been made up and a complete price list is available he aims at obtaining comparative costs per unit not only for the whole system but also for each District, available within a fortnight to three weeks of the end of the month.

Drivers’ line-clear tickets are checked both in the District and Head Offices; the latter check appears unnecessary.

The engine, boiler and vehicle registers are simple and call for no comment.

232. The fuel used throughout is wood, practically all the requirements of the Central Railway being obtained by contract; on the Tanga Railway about two-thirds are obtained by contract, and the remainder is cut by labour directly employed by the Railway.
The average cost per 100 cubic feet is 3 florins 75 cents on the Central Railway, the average over the whole system, including the Tanga Railway, being 4 florins 25 cents per 100 cubic feet. This compares with a present price of 6 florins 50 cents per 100 cubic feet, and an estimated cost for future contracts of 5 florins per 100 cubic feet on the Uganda Railway.

So long as wood fuel remains at so low a figure as 4 florins 25 cents per 100 cubic feet, or any price close to that, there can be no question of replacing it by oil fuel.

A further factor is the presence of coal indications in the Territory. Such indications have been noted to the North-west of Lake Nyassa and also in an area south from Morogoro and south-west from Ngerengere. If coal is eventually found in paying quantities it would, of course, affect the whole fuel situation of the Railways, and the possibility of its being found in such quantities places any idea of adopting oil still more out of the question.

Meanwhile, there is no doubt that the Railways should continue to use wood fuel. / The stocks on hand average three months’ consumption, which is not excessive.

233. Fuel and oil consumption per train mile for each engine and driver are worked out and are available in good time for action to be taken.

Recently the system of regulating the issue of oil to engines by means of fixed rations has been introduced, and has resulted in marked decrease in consumption. As the drivers become accustomed to it, the Chief Mechanical Engineer intends to reduce further the quantity of the ration issued.

No statistics are kept, however, for oil consumed in the lubrication of vehicle axle-boxes. I think it would be advisable to maintain these so that the consumption can be gauged. It forms an important item of expenditure and so long as it remains unchecked waste is liable to occur.

As on the Uganda Railway, I think the experiment of trying castor oil should be tried; the Railways should do the extraction of the oil, obtaining the beans by local purchase, or by themselves undertaking the cultivation.

234. Inspection appears to be carried out thoroughly and regularly.

235. There are three separate workshops establishments on the system, situated respectively at Dar-es-Salaam, Tabora and Tanga. The largest is the installation at Tabora, where the layout and equipment of the shops are modern and good. The European staff employed there consists of an Assistant Locomotive Superintendent in charge, a boilermaker foreman and a charrmans millwright.

The workshops prepare their own salary sheets, and as soon as the price list of stores is prepared and the arrears in the Accounts Department have been made up, they will be in a position to render returns of approximate expenditure
within a fortnight to three weeks of the end the month, and the system has been devised with this intention.

The various jobs in hand in the shops are carried out under a system of works orders. Separate works orders are given for special jobs, but in the case of ordinary routine work such as heavy repairs to engines, individual works orders are not prepared, although the time worked on each engine is noted. For the reasons given in para. 44, Part I., namely, in order to give the Superintendent in charge a standard of comparison and to let him have a relative idea between what he is spending on individual jobs and what he ought to be spending, I think a simple costing system should be introduced. The existing procedure is in advance of that at present in force on the Uganda Railway, in that the official in charge knows promptly what he is spending in wages, and shortly, when the price list is issued, will know soon after the end of the month what approximately he has spent in every direction during that month. The initiation of a costing system will complete the control by giving him the means of judging the expenditure by the results.

As the salary sheets are already compiled in the works office, the introduction of a costing system, provided it is simple, should not entail a large increase in clerical work.

The shops at Dar-es-Salaam and Tanga are run on similar lines, but in their cases the introduction of a costing system is not of such importance as the shops are smaller, and can be adequately controlled by the general supervision of the foreman in charge. Nevertheless, even in these cases a costing system would help, provided it is not too elaborate, and the best course to pursue would be to wait until the system had been introduced and got into working order at the Tabora shops, and then to introduce it subsequently, modified if necessary, at the other two shops. / 236. Although the bulk of the skilled labour employed both in the running and the workshop branches is Asiatic, there has been a marked decrease recently owing to the difficulty of obtaining suitable drivers and artizans from India. This is in part due to the bad reputation which the climate of Tanganyika, and Dar-es-Salaam in particular, earned in India during the War. The bad quarters provided at Dar-es-Salaam are also partly responsible. The deterioration in the quality of recruits is even more marked on the Tanganyika Railways than on the Uganda Railway, which is attributable, not only to the reasons given above, but also to the want of experience of the agents in this class of business.

The Indian staff is thus not only distinctly inferior in quality, but has recently diminished in numbers. Largely in consequence of this the problem of training the African has reached a stage much in advance of that on the Uganda Railway. The Tanganyika Railway have been assisted in this by the legacy of the German
policy, under which considerable progress had been made in training the natives, although no definite scheme appears to have been in force.

At the present time not only are a good proportion of the engine drivers African, but the whole of the skilled labour employed in the moulding shops at Dar-es-Salaam, including the charge-hands, is African. The tools in the sawmills are practically all run by Africans, and they are also employed on wheel lathes, shaping machines and rough turning. The carriage fitting is done entirely by Africans, under the supervision of a European.

At Tanga the whole of the new carpentry work, some of it requiring a good standard of skill, such as the making of louvred windows for carriages, is done by Africans under the supervision of a Japanese charge hand.

The shortage in the recruits from India had, however, reached such an acute stage prior to my visit that the rate of work in the shops had suffered noticeably. The General Manager, therefore, considered that no time should be lost in putting the training of the African on a proper basis, so that the whole supply of skilled labour required could be obtained locally. With this object he asked for an increase of European foremen and chargemen, because the existing European staff could not undertake the training of natives in addition to their present duties without allowing the work in connection with the latter to fall in arrear. In view of the delay already caused by the deficiency of skilled Asians, it is doubly important that further delay should not be occasioned by diverting European foremen from their present duties.

I examined the question with the General Manager, and in agreement with him proposed to the Governor that the establishment of foremen and chargemen should be raised to 15 to allow for instructors.

I have pointed out in Part I. of this Report the vital importance to these territories of training and providing their own skilled labour, so as no longer to be entirely dependent on another country, and I would therefore urge most strongly that the demands put forward by the Tanganyika Railways should be approved.

While the situation is better in Tanganyika than in Kenya as regards the steps already taken, it is worse in that the difficulty of obtaining suitable recruits from India is already reacting on the output of work.

237. The Locomotive Department are also in charge of the saw-mills situated at Sigi in the Usambara Mountains. These mills are connected with the Tanga Railway by a 75 c.m. line, 23 kilometres long. Both the mills and the line were the property of a private company before the War. They do not form part of the Railway property, and the interest of the Railways in them is confined to their temporary administration. As they are ‘enemy property’ they will presumably eventually be sold by the Custodian of Enemy Property. [...]
238. The Locomotive Department are also charged with the working of the Nyanza Salt Works at Uvinza, kilometre 1132, on the Central Railway. [...] 239. It will be noted that while I have recommended the adoption of the ‘divisional’ organization on the Uganda Railway, I have made no similar recommendation regarding the Railways in Tanganyika. My reasons for not doing so are threefold.

On the Central Railway the whole of the commercial life of the country is centred in Dar-es-Salaam. No up-country centre like Nairobi exists. The headquarters of all the commercial and business concerns are stationed at Dar-es-Salaam. All except a very small fraction of the traffic either emanates from there or is consigned to it. As the Headquarters of the Railways are also there, there is not the same necessity for having at points away from Headquarters officials who can give orders to both the operating departments.

The second reason is that the splitting up of the repair workshops into two, or, if the Tanga Railway be included, three separate shops, necessitates a similar splitting up of the mechanical Department, whether the latter controls the running of locomotives or not. The same saving in staff cannot therefore be looked for as when, as in the case of the Uganda Railway, the shops are concentrated.

The third and most cogent reason is, however, that, after striving against considerable difficulties, the Tanganyika Railways are gradually developing their organization and getting it into working order. To introduce the ‘divisional’ system would mean that a lot of the work already accomplished would have to be thrown into the melting pot. New superintending staff would have to be introduced, and the building up of the organization would have to be commenced over again.

These three reasons have therefore led me to the conclusion that the sounder policy, certainly at the present stage of development, would be to retain the ‘departmental’ organization.

CHAPTER IV. – ENGINEERING DEPARTMENT.

240. As stated in the Introductory Chapter, the Germans, in the construction of the Central Railway and its buildings, maintained a high standard; even in the coastal section of 225 kilometres, where a lighter section of rail was used weighing 42 lb. per yard as against 56 lb. per yard elsewhere, the general standard of construction was high. The same remarks apply to the Tanga Railway, although not to the same degree; in this case a 31 lb. rail was used on the coastal section of 91 kilometres and a 40 lb. rail for the remainder. The construction, both of the track and buildings, though not of the same excellence as on the Central Railway, was, nevertheless, of a superior standard to that adopted on the Uganda Railway.
The buildings and stations are of permanent type, usually of stone; the lines are fully ballasted throughout up to a good section, except between Tabora and Kigoma, where, although the ballast had not yet been laid, the quantity which will eventually be required to ballast up to full section was stacked in preparation.

The characteristics of the Voi-Kahé Military Railway have been described in the Report on that Railway contained in Appendix I, Part I.

241. Considerable damage was done to both Railways during the war; the damage done to the bridges and structures has, for the most part, been already repaired, although in a certain number of cases the girders of bridges are still resting on temporary piers, and some of the water tanks are still on sleeper cribs. Money has been asked for to replace these by permanent structures, but owing to the scarcity of funds, no moneys have yet been made available. It would be economical to provide the sums required for this purpose as early as possible, the yearly cost of maintaining such temporary structures being much in excess of that required if they were permanent.

242. The buildings suffered considerably during the War; the military only maintained in proper condition such as they required for their own purpose, and up to the standard which sufficed for that. Thus in many of the station buildings windows are damaged, doors broken and roofs and ceilings are in a bad state of repair. If left in their present condition these buildings will deteriorate rapidly. The longer they are left as they are, the heavier in proportion will be the cost of ultimately repairing them, and making them habitable. At the moment some are not occupied, but with any revival in trade and increase in traffic, the stations will have to be reopened and the buildings made fit for occupation. Once they have been put into a proper state of repair, the annual cost of maintaining them in a proper state will be small. It is, therefore, the soundest economy to put them into thorough repair now, even if the necessary money has to be found by reduction under other heads. These remarks apply not only to the items included under the ordinary heading of maintenance of buildings, but also to the demands placed under the heading of ‘Special Capital Expenditure on Maintenance and Improvement of Buildings.’ The title of ‘Special Capital Expenditure’ is a misnomer, as the items relate to larger repairs which have been put off.

Although the quarters which were built by the Germans are good, the number is insufficient to house the existing staff, at the larger centres, especially Dar-es-Salaam and Kigoma. The shortage at Dar-es-Salaam refers more particularly to Asiatic employees and appears to be due to the German policy of not providing quarters for them, but making them find their own. The absence of suitable quarters has had a bad effect on the health of the Asiatic staff, and the high percentage of sickness amongst them has been attributed to it. It has also directly affected the recruiting owing to the bad reputation which the town has
gained in India. The amount paid out annually in lodging allowance to Asiatics in Dar-es-Salaam exceeds £3,000; a scheme to house the same number (124 in all) has been prepared and is estimated to cost £22,000. Allowing interest and sinking fund charges at 8 per cent., annual renewal charges at 1½ per cent., and the annual cost of maintenance at 1 per cent. of the original capital cost, the total cost per annum under this scheme will amount to £2,310, or a saving of at least £700 a year over the present cost of lodging allowances. The scheme thus will show a substantial saving in addition to the advantage of providing better housing for the staff and so getting better work from them, and a lower percentage of absence due to sickness. The latter constitutes a considerable pecuniary loss as the Asiatic employee receives full pay for the first 45 days of certified sickness. I therefore recommend most strongly that the scheme should be sanctioned and funds provided.

The absence of quarters at Kigoma is due to the fact that the Germans had not completed their building programme there, and had provided no quarters except one or two in the main station building. Apart from the two senior officials housed in these quarters, the remainder are accommodated in temporary wooden buildings hastily erected by the Belgians. At the time of taking over the roofs were in most cases not even sun-proof; this defect has been remedied, but the buildings, even when thus improved, cannot be described as anything more than shelters. As long as they are housed in such structures the health of the staff and their efficiency is bound to suffer. Moreover, the life of the buildings themselves will at the most be only three or four years, and they will be very expensive to repair. I therefore consider that suitable quarters to replace them should be erected without delay.

The capital expenditure thus incurred will not be wasted whatever policy may be adopted as regards the future of the Railway, because Kigoma is the chief port on Lake Tanganyika and must remain so; not only are the Railway requirements there bound to increase, but it will also be the Headquarters of any Marine service undertaken by the Government.

243. The maintenance of the track itself is excellent except on the first section between Dar-es-Salaam and Ruvu, kilometre 80, and on the section between Tabora and Kigoma. The first-named section is the oldest on the line, and considerable arrears of maintenances had been allowed to accumulate both during and for some time after the War. Special attention is now being directed to it, and it should soon be up to the same standard as the remainder.

The section Tabora-Kigoma was also in a bad state when taken over, but special attention is also being given to it and a marked improvement has already been effected.

244. The maintenance and future of the Tanga Railway and of the Voi-Kahé Military Railway has already been discussed in the report which forms Appendix
I. to Part I. of this Report; an early decision as to the future policy in respect of these Railways would be of advantage as under the present arrangement considerable annual charges are being incurred in maintaining sections which may either be altered or pulled up.

245. The organization of the Engineering Department on the Central Railway comprises three Districts instead of two, as in the case of the Locomotive and Traffic Departments. The Headquarters of these are at Morogoro, Tabora and Kigoma. In the Morogoro District, although the District Engineer is in charge of the maintenance of track in Dar-es-Salaam station and yards, the charge of buildings at Dar-es-Salaam station and yards, the charge of building at Dar-es-Salaam is placed directly under the Chief Engineer.

I am of opinion that the amount of work now existing on the Central Railway does not justify its being split up into three Districts. The actual extent of track to be supervised is 1,244 kilometres which if split up into two Districts, would give to each the control of about 390 miles. / Although the actual length is not exceptional, the scanty train service and the fact that each District is stretched out in one long line means that more time than ordinarily necessary must be taken up in traveling. But, after making allowance for these points, I think that both the small amount of work actually in progress and the stringency of the financial situation demand the elimination of one of the Districts.

If the housing question permits, the Headquarters of the two Districts thus left should be Dar-es-Salaam and Tabora respectively, so as to coincide with the District Headquarters of other Departments. The charge of the buildings at Dar-es-Salaam should be transferred from the Chief Engineer to the District Engineer, because it is not the duty of the Chief Engineer to be supervising detail work, and in doing so he infringes on the proper control by the District Engineer of his District.

For each District one Assistant Engineer in addition to a District Engineer will be necessary.

The maintenance of the Tanga Railway is in charge of a District Engineer, with an Assistant Engineer under him. The actual staff required on this line must depend on the policy adopted with regard to the Voi-Kahé Military Railway. As long as the maintenance of that line has to be undertaken by the Tanga Railway and Assistant Engineer will be required in addition to a District Engineer. If my recommendations as regards the severance of this connection and the pulling up of the northern section of the Tange Railway are adopted, a District Engineer alone will suffice, once the various works have been completed.

Allowing 1 Assistant Engineer for work in the Head Office, the establishment, excluding vacancies for leave, under this arrangement, will, until the work on the Voi-Kahé line has been completed, be:–

1 Chief Engineer;
3 District Engineers;  
4 Assistant Engineers,  
or, allowing 2 vacancies for leave:—  
1 Chief Engineer;  
3 District Engineers;  
6 Assistant Engineers,  
totalling 10 in all. The original Estimates for 1921 – 22 showed:—  
1 Chief Engineer;  
4 District Engineers;  
9 Assistant Engineers,  
or, 14 in all. At the time of my inspection the staff consisted of:—  
1 Chief Engineer;  
3 District Engineers;  
8 Assistant Engineers.

The effect of my recommendations would therefore be to reduce the numbers shown on the establishment by 1 District Engineer and 3 Assistant Engineers, and of those actually employed by 2 Assistant Engineers.

When the work of pulling up the northern section of the Tanganyika line and relaying the coastal section has been completed, the establishment could be further reduced by 1 Assistant Engineer.

The establishment which I have recommended allows for normal maintenance and renewals work; if extensive capital expenditure is undertaken, extra supervision will have to be provided.

In addition to the above reductions, I consider that a European draughtsman as shown in the original Estimates for 1921–22 is not required.

The elimination of one District office will automatically reduce the clerical establishment because, although more work will be thrown on the remaining two Districts, the increase required in their establishments should be less than the total clerical staff now employed in the third District office.

A further direction in which establishments could be reduced, when the arrears of maintenance of buildings have been made up, is in respect of Inspectors and Sub-Inspectors of Works. The establishment in the original Estimates for 1921–22 was 5 Inspectors and 4 Sub-Inspectors. It should be possible when arrears have been made up to reduce these to 3 Inspectors and 3 Sub-Inspectors. If the building scheme which has been recommended for Dar-es-Salaam is approved, extra Inspectors will be required, but they would be a charge against the special funds granted for that purpose.

246. As in the case of the Uganda Railway, I do not consider there is justification for the salary of the Chief Engineer being fixed at £1,200 a year, while the Traffic Manager and Chief Mechanical Engineer receive £1,100. His duties and responsibilities, so long as the construction of new lines is not under him, are no
greater, and I recommend that future holders of the office should receive £1,100 a year. If a large construction scheme is in contemplation, and it is intended to place its execution under the Chief Engineer, the question of once again raising the salary to £1,200 could be reconsidered.

247. The allocation of funds and the control of expenditure appears to be on a satisfactory basis so far as the absence of a proper price list admits. District Engineers forward returns of approximate expenditure on salaries by the 20th of the following month. In the case of Tanga, owing to the bad communications between there and Dar-es-Salaam, the delay is of course longer. When a price list has been issued these returns will include approximate expenditure on stores as well. No schedule of prices is yet in existence for the same reason, but the Chief Engineer has instructed District Engineers to keep accurate and complete records of work done so that a schedule can be compiled as soon as circumstances permit.

248. The average number of men employed per kilometre on maintenance of track is 1·3, or 2·1 men per mile, except on the Tabora-Kigoma section, where extra labour has had to be employed to get the track into proper shape. On certain sections of the Tabora District where the track has already been put into good order the labour on maintenance has been reduced to ×9 men per kilometre, and eventually when the arrears of maintenance have been made up it should be possible to reduce to an all-round average of 1 man per kilometre for the whole line, owing to the excellent standard of construction, and small traffic carried.

The question of the wages paid to this labour is dealt with in Chapter VII. relating to Staff Questions. /
in April, 1919. Subsequently the War Office representatives made lists of the stores remaining on the system, and drew up a valuation amounting to approximately £595,000, including the material constituting the Voi-Kahè Military Railway, which was estimated at approximately £161,000.

The model of Stores Accounting adopted by the Civil Administration, as in the case of the Uganda Railway, was that of the Indian State Railways, in which the priced ledgers are kept by the Accounts Department, and only quantity ledgers by the Stores Department. But whereas the quantity ledgers for all stores held on charge of the Stores Department were in good working order, no priced ledgers were started, nor was any attempt made to draw up a price list. The absence of any prices for articles left over from the German period and of priced invoices for most of the items obtained through the War Office made the proper pricing of stores difficult, but the natural consequence of having no priced list or priced ledgers was that it was impossible to allocate stores to revenue subheads.

This state of affairs lasted until the arrival of the present General Manager in September, 1920. He recognised the bad effects of this situation, and gave instructions for a price list to be prepared, and priced ledgers started. The prices are naturally only approximate, but they enable debits to be made against revenue subheads, which can be amended later when the actual prices are established and after the figures at which the items will be purchased from the War Office have been determined. As regards items purchased since the Civil Administration took over, either through the Crown Agents for the Colonies or through the Agents in India, there is little difficulty in fixing prices.

Priced ledgers were commenced as from 1st April, 1921. Issues made previous to that date are being examined by the Accounts Department, and the necessary adjustments made. A preliminary price list was issued in January, 1921; a more complete one was in course of preparation at the time of my inspection, based so far as possible on actual cost prices, but where these are not available, on the most accurate approximations which can be made. The compilation of the final list must necessarily wait until the purchase price for the various items from the War Office has been determined.

The prices demanded by the War Office representatives are disputed by the General Manager as being excessive; the lists prepared by them have been examined and amended by him. He has revalued the material at what he considers to be fair prices, the total of his revaluation amounting to approximately £283,000 for the whole of the material excluding that on the Voi-Kahè Military Railway, which compares with the price already put forward for the same of £434,000. This question is still under discussion.

While the duties of the Chief Storekeeper, as limited under the Indian State Railway method to responsibility for the quantity of stores held by him, appear to have been carried out, the stores accounting, which is a function of
the Accounts Department, was allowed practically to remain in abeyance until September, 1920. The situation was undoubtedly abnormal and the difficulties great, especially as regards the absence of any exact basis for pricing the stores, as well as shortness of staff, but the longer matters were left in that condition the greater the accumulation of arrears. If an approximate price list had been prepared during the earlier days, allocations could have been made against revenue subheads which could have been adjusted subsequently when the exact prices had been fixed.

Great efforts have been made since to put the organization on to a proper basis and to clear up past arrears. As stated earlier, allocation of expenditure on stores to subheads was instituted as from 1st April, 1921, and all issues prior to that date are being examined and adjusted. For this great credit is due to the Deputy Chief Accountant, who arrived towards the end of 1920, and was acting as Chief Accountant from the time of his arrival until July, 1921.

The taking over of the Tabora-Kigoma section from the Belgians in April, 1921, has added a further complication. All items of material on the section were carefully checked and lists were drawn up and signed by both parties, but no prices were obtainable at the time from the Belgians. It is understood that they are now preparing a priced list, and the General Manager is also having the articles priced. The work of taking over appears to have been carried out in a very thorough manner.

250. The indebtedness of the Railway Administration in relation to the whole of the stores left by the Military Authorities does not appear to be clearly defined. Apart from the question of the actual prices to be paid, which, as I have mentioned earlier, is under discussion, the point arises as to whether the Railways are bound to take over the whole of these stores irrespective of whether they need them or not. In many respects they bear no relation to the actual requirements of the Railways, many of them being quite unsuitable for the present work, or of a type or standard which cannot be used, and of other items, such as metals, the stocks held are far in excess of what the Railways will require for 10 years to come.

The Chief Storekeeper is quite rightly insisting that, in preference to ordering new stocks, Departments must use up articles in stores whenever it is possible to do so, without detriment to the work, although they may not be of the exact type or standard which the Department would choose, and this rule should be rigidly observed. But there is still bound to remain a large residue which cannot be employed by the Railways. The Chief Storekeeper has compiled a list of all articles surplus to a year’s requirements and is endeavouring to dispose of them to other Government Departments and private firms, but it is doubtful if he will be able to get rid of the whole surplus in this manner.
If the Railways are compelled to take over the whole stock they will be saddled, first, with stores which they will never be able to use at all, and secondly, with large surpluses which they will not be able to consume for several years. During this time, however, interest charges will have to be paid on the capital thus expended.

I have been unable to obtain any information as to how far the Railways are definitely committed to purchase the whole of the stocks; neither the General Manager nor the Treasurer of the Territory were able from their records to give me any precise information as to whether or not the late Acting General Manager had finally agreed to take them over in bulk. If he has, it is too late to upset the arrangement, but in fixing the prices, which are still under discussion, adequate reductions should be made to compensate the Railways for thus taking over the stocks in bulk and so relieving the War Office of the trouble and expense of finding purchasers for the various individual items and for taking over certain stores which are of no practical value to the Railways, and other stores which are surplus to their present requirements.

If the Railways are not definitely committed, they should not accept any stores which they cannot eventually use, and should only accept stocks which are surplus to requirements at figures which will compensate for the interest charges which will accrue before they are ultimately used.

251. In addition to the stores listed and held on charge of the Stores Department, there was a considerable quantity of material scattered along the system. This is now being collected and sorted; the permanent way material is being collected at specified stations where it is placed on charge of the local Permanent Way Inspector. The cost of collecting the whole of this material into Stores depôts would have been considerable, and the system adopted appears to give an adequate check.

At many of the larger centres, notably the locomotive workshops at Tabora, large stocks exist which were left over after the Military Administration, but are not and appear never to have been on anyone’s charge. The Locomotive Department has no accurate knowledge of what these stocks consist nor are any lists in existence. At the time of my inspection these stores were being transferred to the District Stores which had recently been started at Tabora. There they were being sorted out and listed. This operation necessarily entails the employment of extra labour and there is a possibility that under the reduced Estimates it may be difficult to find the necessary funds. I would urge, however, that a service of this nature should be given precedence; as long as these stocks remain unsorted the Railways may be purchasing articles which they already possess, but of whose existence they are unaware. The expenditure will thus probably result in a direct saving in money. When the stores have been properly sorted and listed, it should be decided which can be used. These should be taken on charge by the Stores
Department and the remainder should be disposed of, if possible, by sale, or if no buyer can be found, should be converted into scrap. The presence of large quantities of useless stores merely takes up store and shed accommodation which could be more profitably employed.

252. The Stores Department is organized into three Districts, Dar-es-Salaam, Tabora and Tanga, of which the former acts as the Central Stores, all stores on indent from overseas being received there. The Stores at Tabora had only recently been established at the time of my inspection.

The system adopted for the receipt of stores from overseas and for the transfer of stores from Dar-es-Salaam to the District Stores appears to give an adequate check, and calls for no comment.

The procedure for indenting and issue of stores to Departments, although in general similar to that in force on the Uganda Railway, is in certain respects even more elaborate. Only certain officials are permitted to indent; they do so by means of a requisition note made in duplicate. These requisitions have entered on them the appropriate allocation. They must be countersigned by the District Storekeeper before issue is allowed, and are entered in a register under Departments before being sent to the Store-wardens, who make out from them issue / notes in quintuplicate. The five copies of the issue note are used in the following manner:–

1 copy remains for record in the Stores;
1 copy accompanies the goods to the indenting official, and is returned by him as the receipt;
3 copies are sent to the Accounts Department.

These last three copies are priced in the Accounts Department; one is then retained there, and the allocations to the revenue subheads are made from it. The remaining two are sent by the Accounts Department to the Head of the Department to which the indenting official belongs. Of these two copies of the issue note the Head of the Department retains one in order to make the proper entries in his expenditure ledger, and passes the second to the indenting official.

The Accounts Department make out, in addition, daily and monthly summaries in duplicate of issue notes against each indenting official, and send them to the Head of the Department.

When the complete price list has been issued, the intention is to do the pricing of the issue notes in the Stores; this will remove the necessity for the fifth copy of the issue note.

The postings to the quantity ledgers in the District Stores, and to the priced ledgers in the Accounts Department are made from the issue note. These two sets of ledgers should be constantly compared, to avoid any discrepancies creeping in. In addition, each Store-warden maintains a quantity card ledger for the stores for which he is responsible. Frequent comparisons are similarly necessary.
between these card ledgers and the quantity ledgers maintained by the District Stores.

Verification of stocks by verifiers from the Accounts Department is carried out in the ordinary way.

253. From this description it will be seen that the system, even after the Stores Department has commenced to do the pricing and the fifth copy of the issue note has been eliminated, will be very cumbersome, even more cumbersome in fact than that in force on the Uganda Railway.

It has the same disadvantages as the latter regarding the necessity for maintaining two separate sets of ledgers and for checking in the Accounts Department every invoice made out on the Railways, as regards every detail of pricing, nomenclature, &c. It equally possesses the same drawback as regards the delays which take place in rendering accounts for stores against revenue subheads and the large clerical staff it necessitates. The system on the Tanganyika Railways has, in addition, the further complication of the card ledgers maintained by the Store-wardens. Three separate sets of ledgers are thus maintained.

In paras 88–91 of Part I., I have described the objections to the method of stores accounting employed on the Uganda Railway, and have put forward a system to take its place. The system is described in the paragraphs quoted above, and it is, therefore, unnecessary to repeat the details in full here. The main features are that the Accounts Department do not maintain any ledgers, which are, instead, all kept by the Stores Department. The Stores Department do the pricing of articles and issue the price list, and the amendments thereto. At the end of each month the Stores Department send to each indentor a return of stores debitable in triplicate, two copies of which the indentor returns to the Stores Department receipted and allocated. One of these copies is forwarded by the Stores Department to the Accounts Department, and from this the necessary adjustments in the accounts are made. The system provides all the necessary checks while, at the same time, it is simpler, requires fewer staff to work it, and allows returns of approximate expenditure to be compiled early. For these reasons I recommend that it should be adopted on the Tanganyika Railways.

254. It is impossible in the present state of the Stores branch of the Accounts Department, employed as it is in clearing up arrears and preparing a proper price list, to state what ultimate saving in staff can be effected by the adoption of the new system, but on the analogy of the Uganda Railway an appreciable decrease should be possible after allowance has been made for the small increase of staff which will be required in the Stores Department.

255. I would further suggest the introduction of maximum and minimum balances. For every item the maximum and minimum balance, which should be held by each Stores, are determined; the figures are then entered in red ink on the right hand top corner of the ledger folio. The Storekeeper knows at any time
how his stocks stand in relation to the minimum balance, and when they have run down to that figure, he automatically orders more, the maximum balance fixing the limit up to which he should order. In fixing the maxima and minima, allowance must, of course, be made for the time which it usually takes for that particular Stores to receive stores after it has ordered them.

256. The Chief Storekeeper has powers to accept tenders for local purchases up to Florins 100; for purchases above that figure the approval of the General Manager is necessary.

Although up to date no difficulty has been experienced, nor dissatisfaction manifested with this procedure, with any growth in the Railways’ demands for local products there is likelihood of such occurring, and I would, therefore, recommend the institution of a Railway Tender Board, in order to give a certain measure of protection to the General Manager and the Chief Storekeeper. I understand a Government Tender Board is being instituted, but this would be on a larger scale than the one proposed for the Railways. All tenders for stores purchased locally, whether consisting of imported goods or local products, would be opened by the Railway Tender Board, who would consist of at least two members, one representing the Stores Department, and the other the Department interested in the purchase. The Board, after scheduling the Tenders, would make recommendations as to acceptance to the General Manager, in whose hands the final decision would lie. This procedure might be limited to purchases exceeding Florins 100.

257. The salary of the Chief Storekeeper is fixed at £800 a year; this salary is the same as the upper limit obtainable by District officials, such as District Engineers. As the Head of a Department, the responsibilities of the Chief Storekeeper are heavier than those of a District official, and will be increased under the system proposed above, in accordance with which the Stores Department alone will be responsible for the maintenance of all ledgers. I consider that the fact that he has larger responsibilities than a District official should be marked by a higher rate of pay. In the case of the Chief Storekeeper of the Uganda Railway, I have recommended a salary of £900 a year, but as I do not consider the duties of the Chief Storekeeper of the Tanganyika Railways are so onerous, nor his responsibilities so great, I recommend that in future he should receive a salary of £850 per annum. /

CHAPTER VI. – ACCOUNTS DEPARTMENT.

258. When the Civil Administration took over charge of the Railways in April, 1919, the Indian State Railway Code was adopted as the general model for the system of accounting to be adopted.
To initiate a comprehensive system of commercial accounting, when the Railways have already been in operation a year or two under military conditions was bound to be a difficult operation, and in this case the difficulties were increased by the confusion in respect of the stores to which reference has been made in the previous chapter, by shortage and incompetence of staff, and by the necessity for maintaining two sets of accounts, one for the military period up to 1st April, 1919, which had not yet been closed, and the second for the post-war period, subsequent to that date. The settling up between the two regimes further complicated matters, while the position was not improved by the absence of the Chief Accountant on duty in India from April to September, 1919.

Until the arrival of the General Manager in September, 1920, little progress appears to have been made. At that date the accounts for 1919–20 had not yet been closed, no price list for stores or priced ledgers were in existence, and the ration accounts, stretching back to April, 1919, had not been squared up. When the accounts for 1919–20 were presented to the Local Auditor he commented, under date of the 12th March, 1921, that they showed a most unsatisfactory state of affairs, and that there were serious errors in accounting. He further stated that the summaries of stores transactions failed to satisfy the most elementary principles of stores accounting and passed severe comment on the ration accounts.

Other unsatisfactory features in the methods of accounting were the fact that whereas the Colonial Office Regulations call for the preparation of two sets of accounts, namely: the Treasurer’s Cash Account, which reflects only amounts received and disbursed during the particular month under review, and the Railway Account, which shows actual revenue and expenditure relating to that month, irrespective of whether the amounts were actually received or disbursed in that month, no Railway Account had been maintained prior to March, 1920. When an effort was made to start a Railway Account, it was discovered that there were discrepancies in the figures submitted monthly in the Treasurer’s Cash Account, up to the month of July, 1920. These were adjusted in the Treasurer’s Cash Account for August, 1920.

In the fuel accounts, expenditure incurred on the purchase of fuel had been debited direct to the final revenue head, irrespective of whether the fuel had been consumed or not, while, on the other hand, fuel taken over from the military authorities, but not yet paid for, was being consumed without any charge being debited against the final revenue head.

No reconciliation of amounts debited and credited on account of ‘family allotments’ had been made, no ledger reflecting the final results of working had been instituted, and the procedure adopted as regards work done for other Government Departments, sale of stores to private individuals, and the Traffic Account for Earnings, was incomplete.
As the Civil Administration had by that time been established for eighteen months, the situation was distinctly unsatisfactory. In justice to the Chief Accountant, it is only fair to point out that, in addition to the difficulties described earlier, the senior superintending staff in the Accounts Department at that time consisted only of himself and one Assistant Chief Accountant; the latter was in charge of the accounts on the Tanga line, and his services have since been dispensed with on grounds of incompetence. The Chief Accountant himself had had no leave for eleven years, and was immediately afterwards pronounced medically unfit and recommended for instant leave. / 

On the departure of the Chief Accountant on leave, the Head Accounts office at Dar-es-Salaam had to be left in the charge of a subordinate official until the arrival of the newly appointed Deputy Chief Accountant in December. This official tackled the problem with commendable energy, with the result that at the time of my inspection in July, 1921, considerable progress had been made. The accounts for the whole system for January, 1921, were closed during June, 1921; the final accounts for the whole system for February and March, 1921, were waiting for the completion of the Tanga Railway accounts, those for the Central Railway being complete.

Priced ledgers have been started as from 1st April, 1921; and Stores accounts prior to that date are being examined with effect from April, 1919, and the various discrepancies referred to earlier were being or had been examined and adjusted.

The accounts of the Tanga Railway, which, on account of its distance from Headquarters, has its own accounting establishment, were in a worse condition than those of the Central Railway. This was largely due to the fact that out of the superintending accounts staff on that line it had been necessary to dispense with the services of one Assistant Chief Accountant and of one Head Accountant, on account of inefficiency and intemperance respectively.

259. As the accounts of the Railways were only emerging at the time of my visit form a state of confusion, it was impossible to make any close investigation, and therefore my recommendations will be rather of a general nature. Also, until the past arrears have been cleared up, it is difficult to establish what staff is necessary for the approaching financial year. No attempt will be made either to review the purely technical side of the accounting, but only such aspects of it as affect the working of other Departments, or the Railways in general.

In para. 105, Chapter IX., Part I., I have examined at some length the numbers employed in, and the cost of, the Accounts Department of the Uganda Railway, as well as the delays which the accounting methods employed involve. As the same methods, in general, with the exception of certain simplifications in the rendering of invoices from stations, have been adopted on the Tanganyika Railways, it is unnecessary to enter into the same detail of comparisons between System of accounting.
the staff employed in the Accounts Department and the number of stations on
the system, or between the cost of accounting and auditing services of the Rail-
ways and the gross receipts.

These comparisons, moreover, would not, by reason of the smallness of the
traffic, afford such a true criterion as in the case of a Railway which has been in
working order and showing a net revenue balance for fifteen years. The same
characteristics, however, of the large clerical staff employed and the delays
involved are observable in both cases.

The actual staff allowed in the original Estimates for 1921–22 for the
Accounts Department was 126, which is even more marked than the 240
employed on the Uganda Railway, when it is remembered that the Tanganyika
Railways do not attempt to maintain the same elaborate statistics. The figures
taken for the Uganda Railway are exclusive of the Press and Stationery staff,
which are under the Accounts Department on that Railway; in the case of the
Tanganyika Railways these services are not controlled by the Accounts Depart-
ment.

In respect of delays, no men at out-stations are paid before the 15th of the
following month, and many are not paid until the 20th of the month or even
later.

The arrears in the Accounts make it impossible at present for the General
Manager to receive promptly returns of expenditure, whether approximate or
complete, but as the same system is employed as on the /

Uganda Railway, it is reasonable to suppose the position will not be much
better then on that system, even when the accounts have been brought up to
date.

260. The Accounts Department is split up into five main branches – (1)
Cash and Pay; (2) Establishment; (3) Stores; (4) General Audit, and (5) Traffic
Audit and Statistics.

The conditions of employment of Asiatic artizans and clerical labour neces-
sarily increases and complicates the work of the Establishment Branch. For these
men, questions of leave, free passages for both them and their families, family
remittances and, in certain cases, rations, are continually arising, in addition to
the ordinary routine of pay, allowances and deductions and all have to be handled
by this Branch. With the increase in the number of trained Africans employed
this work will decrease, but, so long as Asiatic labour has to be imported, these
complications are bound to remain.

I think, however, that the procedure for submitting salary sheets could be
simplified by adopting that which I have recommended in para. 106, Part I.,
for the Uganda Railway, and under which Departments have only to fill in on
the sheet the number of days worked, the number of days' rations received, and

Organization.
the rates of pay, the deductions being subsequently entered up by the Accounts Department.

261. The records of staff should also be reduced. The only complete file relating to any man on agreement should be maintained by the Department employing him. The Chief Accountant should maintain an Establishment Register, in which such particulars should be entered regarding each man working on agreement as are required, but he should not in addition maintain a separate file for every individual.

262. In paras. 252–254, Chapter V., dealing with Stores and also in paras. 88–91 of Part I., I have dealt with the method of store accounting adopted and the objections thereto, and in the same paragraphs I have detailed the system which I propose should take the place of the existing one.

263. The only sections of the General Audit Branch on which I propose to offer any comment are the Suspense Accounts and the Treasury Cash Working Account.

No Suspense Account is maintained for the Workshops. In the absence of this revenue sub-heads have to be used as Suspense Accounts, which is incorrect. A Workshops Suspense Account should be commenced forthwith.

The Sigi Sawmills and the Nyanza Salt Works, being subsidiary undertakings quite independent of the ordinary functions of the Railway, should each have their own separate account.

I have recommended in para. 111, Part I., that the Treasury Cash Working Account should be abolished on the Uganda Railway, as it entails extra expense and complication, whereas it does not afford any more control than that given by the Revenue Account, which the Railway must keep. The same recommendation holds good in this case.

264. In connection with the Traffic Audit and Statistics Branch, the system of consigning and invoicing goods has been fully examined in para. 223 of this part of my Report, and in paras. 27 and 114, Part I., recommendations for the introduction of a new system are put forward.

Recommendations for the introduction of the stamp system for parcels traffic are put forward in paras. 28 and 113, Part I., as well as in para. 224 of this part.

I have further recommended in para. 226 that ledger accounts should be instituted in order to do away with the somewhat irregular system in force at present, under which certain firms are allowed to make use of the same form of warrant as the Government which is subsequently redeemed by cash payments.

No Clearing Section is required on the Tanganyika Railways, because the only point where they connect with a ‘foreign’ Railway system is on the Voi-Kahé Railway, and the clearing of all traffic interchanged there is effected by the Uganda Railway Accounts Department.
The statistics maintained by the Accounts Department are not excessive; only those relating to the number of passengers, passenger-kilometrage, tons carried and ton-kilometrage are kept. Statistics as to commodities carried are obtained by the Traffic Department direct from stations, and as to vehicle kilometrage from the District Stationmasters I do not recommend any change being made.

265. Owing to the arrears existing in the accounts, it is impossible to state what economies in staff can be effected as a result of these recommendations.

In the case of the Uganda Railway, I have recommended the appointment of an additional Travelling Inspector of Accounts, to allow for additional inspection at out stations under the proposed system. Four Inspectors are already provided under the original Estimates for the Tanganyika Railways for 1921–22, and I am of opinion that, for the present, that number should prove sufficient to cope with any extra inspection required.

CHAPTER VII – STAFF QUESTIONS.

General.

266. I have already noted in para. 215, Chapter II., Traffic Department, and para. 236, Chapter III., Locomotive Department, the progress which has been made up to date in training the African, and more especially in respect of the latter Department the measures which it is proposed to put into force to increase the facilities.

In addition, many of the typists in the Head Offices are Africans, and under the Education scheme it is hoped to provide eventually the whole of the clerical labour required.

The progress which has been made is due partly to the legacy of the German administration, but more to the inadequacy and very poor quality of the recruits from India, which has brought home to those in authority the dangers of a situation where one country is entirely dependent on another for its whole supply of trained and skilled labour.

Whatever may be the reasons, however, the result is that a more advanced stage has been reached in the short time the British Administration has been in force than in the neighbouring Colony. Not only are there more trained natives already at work, but a scheme of developing has been formulated, and demands are being put forward for the necessary European instructors.

For these reasons, and because the requirements are on a much smaller scale, I do not propose to recommend a comprehensive scheme, as I have in the case of the Uganda Railway. As such excellent progress has already been made, I think it would be preferable to allow the project to proceed along the lines proposed by those responsible, granting them the additional expenditure for which they are asking under these heads. Later, if the requirements become greater, or should
the present scheme prove inadequate, a larger and more ambitious one could be initiated.

A point, however, to which particular attention should be paid in any scheme, is that undue importance is not given to clerical as compared with manual attainments. The African already shows a strong predilection for working as a clerk, where he can give full scope to his love of dress. This tendency should be checked by giving pay and privileges at least as good, if not better, to the trained artizan.

267. Although nothing definite appears as yet to have been finally laid down, the proposal has been put forward that the same scheme of pensions as on the Uganda Railway should be made applicable. Under this, certain posts, such as those of General Manager and Heads of Departments, are denoted as pensionable, and of the posts of District and Assistant rank a certain number in each grade are similarly made pensionable.

The inequalities of this system have been explained in para. 138, Part I.

At the same time, no Provident Fund has been established on the Tanganyika Railways, so that, except for the few senior officials, whose appointments it may eventually be decided to make pensionable, no provision for retirement, either for old age or sickness, is made for any members of the staff.

It is now universally recognised in all large railway systems that some scheme of insurance against old age, whether in the shape of pensions, provident fund or superannuation scheme, is necessary, both in the interests of the employers and of the staff. Where the State is the employer it is still more important that provision should be made for its servants who have become permanently incapacitated for work, / whether from old age or sickness. It is, in fact, so generally recognised, that it does not require argument. The absence of any provision of this nature on the Tanganyika Railways has given rise to complaints.

Practice varies as to whether the assistance rendered should take the form of a pensions scheme, or of a Provident Fund.

In para.138, Part I., I have explained in full the objections to the adoption of a pensions scheme general to all Europeans as compared with a provident Fund.

Briefly summarised, these objections are that pensions are not conducive to the highest efficiency, as they induce a spirit of prescriptive right and continuity in office, that there is often reluctance on the part of senior officials to dispense with the services of a man who has not yet become entitled to a pension, whereas under a provident fund he would be entitled to his contributions and the Railways’ bonuses, and that a pension scheme is less elastic. Further, the Railways’ commitments are definite under a Provident Fund scheme, and are met yearly as they arise, whereas under a pensions scheme they are not covered year by year throughout the man’s service, but are met only when he becomes due for pen-
Finally, a general pension scheme entails a far heavier expenditure by the Railway.

For these reasons I have recommended that it should be ruled that no staff joining after the promulgation of the order should be pensionable. In the case of the Tanganyika Railways I recommend that a Provident Fund should be started on the same lines and under similar regulations to those in force on the Uganda Railway, and that all staff (European, Asiatic or African) with a salary of 30 florins a month or over should be compulsory contributors to it, and no staff who join after the date of the institution of the Fund should be regarded as pensionable. Staff who at present hold the appointments which it is proposed should be pensionable should retain their pension rights, and not contribute to the Provident Fund. Staff now on the Railways who may eventually be promoted to posts which it is at present proposed should be pensionable should similarly be regarded as pensionable when so promoted.

It would be unjust to deprive any members of the present staff of the prospect of eventually earning a pension, and although the scheme may not have been actually framed, the prospect undoubtedly existed when they joined, and might be regarded by them as one of the inducements to join; but all staff joining subsequently should certainly be regarded as non-pensionable, whatever appointment on the Railways they may hold eventually. Their case would be covered by the Provident Fund, which would thus, after a certain lapse of time, include everyone from the General Manager down to anyone earning 30 florins a month.

I am proposing the application, so far as circumstances permit, of the Uganda Railway scheme, because it appears well adapted to local requirements, and offers as good terms to the contributors as their particular conditions of service permit.

The initiation of such a scheme will undoubtedly add a considerable sum to the annual expenditure of the Railways, as a contribution will have to be paid equal to one-sixteenth of the salaries of all servants receiving 30 florins a month or over. In the case of the Uganda Railway, it is estimated to cost £15,000 in the year 1922; it is difficult to assess the exact cost in the case of the Tanganyika Railways, but in any event it will not exceed that figure, and will probably be more in the neighbourhood of £10,000. But it is essential, in justice to the servants of the Railways, that a scheme should be put into force at an early date, and that the present indefinite state of affairs, in which no provision whatever is made for their eventual retirement should cease as early as possible.

The fact that the Railways are not yet paying concern cannot be held to absolve the Government from its duty in this respect.

Uniformity between conditions of service on the Uganda and Tanganyika Railways.

268. The present regulations regarding conditions of service on the two systems, the Uganda and the Tanganyika Railways, are generally identical at present, and the conditions are in many respects similar; it follows, therefore, as a matter of course, that my recommendations have, in general, been the same in
both cases. This uniformity will have great advantages in the case of any transfers of staff between the two, or should it be decided to amalgamate both systems at any future date.

Europeans.

269. The following recommendations made in Part I., as regards the European staff of the Uganda Railway, are applicable in the case of the Tanganyika Railways:–

Part. 134 – That consideration should be given, when the question of local allowance is reviewed, not only to the level of prices at that time ruling, as compared with that of August, 1920, but also that injustice is not done to officials already in the Railway, and that the remuneration offered is on the same level as obtaining on other Railways similarly placed.

Para. 135. – That officials should be compelled, if returning to the Colony, to spend one-fifth of their period of leave in professional work.

Para. 136. – Regarding interchange of officials between Colonies on promotion to District rank.

Para. 137. – That in order to do away with any injustices as regard seniority caused by the higher war bonus granted to men married before 1st April, 1920, a seniority list should be drawn up for each grade, treating all as though they were on the basis of the salary which they would have received if unmarried.

Para. 141. – That, although no increased assistance beyond that now granted be given towards passages for wives and children of married officials, officials whose families are in Tanganyika should be permitted to extend their tour of service up to five years, and accumulate leave for that period.

Asiatics.

270. The following recommendations made in Part I., regarding Asiatic staff, hold good as regards the Tanganyika Railways:–

Para. 148. – That the scale of salaries for Asiatics should be reviewed in April, 1922.

Para. 150. – That the decision as to which responsible posts should be held by Asiatics should be left to the discretion of the General Manager.

Part. 151. – That the same recommendations regarding anomalies caused by varying war bonuses apply as in the case of Europeans.

Para. 153. – That in cases of certified illness in East Africa, instead of employees being granted 45 days’ absence on full pay, but only receiving half pay for the whole period if the illness exceeds 45 days, they should be allowed full pay for the first 30 days, and half pay for every day’s illness over 30 for a further 60 days.

Para 158. – That the question of granting facilities for dental treatment for Asiatics should be examined by the Railways.
Para. 161. – That a definite scale of compensation for cases of injury on duty should be drawn up.

Para. 162. – That the form of agreement for artizans should be amended (if this has not already been done) so as to show clearly the members of the artizan’s family for whom he is entitled to free passages on first appointment. / 

AFRICANS.

271. The wages paid to unskilled native labour are 8 florins per month, plus rations. The rations are calculated as being worth 5 florins per month, so that the pay, including rations, amounts to 13 florins per month. The prices for this class of labour in the Political Districts of Tabora and Dodoma were quoted by the Political Officers as not exceeding 10 florins without rations, and being more generally 8 florins without rations. The wages on the Uganda Railway and in the Nairobi District are 5 florins plus rations, and in this comparison it must be remembered that there is a much greater demand for labour in the Nairobi District and a scantier native population.

It is clear from the above figures that the Railways are paying wages for unskilled labour which are considerably in excess of those ruling outside. The Political Officers with whom I discussed the subject were of opinion that it was much higher than warranted by the cost of living, or by the general state of the labour market. The presence of such a high scale of wages is undoubtedly a legacy of the War, but while prices outside have been going down and wages have been falling, the Railways have stayed at the old figure. The effect of maintaining these inflated prices is also bound to make itself felt on the rest of the country, because the Railways are the largest employer of labour.

It is clear, therefore, that a considerable reduction in wages is called for, but such reduction should not be confined to the Railways; it should be extended to other Government Departments, such as the Public Works, who have been hitherto paying the same rates. Otherwise, labour will be attracted from the Railways to the other Departments. It is difficult to state what should be the exact figure, especially as three months have elapsed since the time of my inspection, and prices may have altered in the meantime. It must vary also to a certain extent between Districts. It would be safe, however, to assume that in the ordinary country Districts, unless any marked change has taken place since July, a reduction of at least 3 florins per month is possible. The wage would then be equivalent, including the rations, to 10 florins per month.

In the case of permanent way labour, although it can no longer be called unskilled when it has been trained to the work, a newly joined labourer should certainly be regarded as such, and paid accordingly. As he remains at work and becomes more proficient, he can be rewarded by successive increments, but on first joining he should not receive more pay than the ordinary unskilled labourer.
When reduction takes place, the difficulty could be got over by treating all permanent way labourers who have been in the Railway service less than a year as unskilled, and all who have been longer as having already earned yearly increments according to their length of service.

Any general reduction of wages such as proposed is bound to give rise to temporary difficulties; some of the men will be discontented and leave and a good deal of raw labour will have to be employed on the permanent way in their place. But the present state of traffic and of unemployment affords an excellent time to carry out the change, and any temporary difficulties will be amply repaid by the reduction in working costs. For example, the cost of wages of trackmen in the original Estimates for 1921–22 was given at £44,463; a reduction in wages from 8 florins per month plus rations to 5 florins per month plus rations, would mean a saving of £10,300 under this sub-head alone.

I understand that the General Manager is in general agreement with these proposals and had in fact taken steps to give effect to them prior to my departure from the Territory.

CHAPTER VIII. – PORT WORKING.

272. At both Dar-es-Salaam and Tanga the vessels lie at anchor in the harbour and cargo work is carried out by means of lighters. The lighters are owned by private companies.

The charges for lighterage are Florins 4·62 per B.L. ton for exports, except hides and skins, which are Florins 5·62, and Florins 6·50 per B.L. ton for all imports. These charges include all handling on the wharf. In addition, there is a charge of Florins 1·0 per B.L. ton for wharfage and cranage for both exports and imports. The wharves at both ports, including the sheds and cranes, are controlled by the Customs Department.

The charges are distinctly high, and must react on the possibilities of development in export when trade improves. Apart from the Government itself entering into the lighterage business and buying up the present concerns, it is difficult for it to take any direct steps to reduce the charges. And in the present state of the finances of the Territory, it is impossible to recommend the outlay of the expenditure which would be necessary to buy up the present concerns.

The only direction in which the Government at the moment can give definite assistance is by simplifying and improving the arrangements on the wharf. This can be done by removing the control of the work there from the Customs Department and placing it under the Railways. So long as the Customs Department is left in control another Government Department is unnecessarily interposed between the two carrying agencies, the Railways on the one hand and the lighterage or shipping companies on the other. It means that in the case
of loss or damage there is added yet another agency to whom the merchant has
to address claims, and a further source of delay in settlement. The control of
the whole wharf accommodation, sheds and cranes should be handed over to
the Railways, the Customs Department carrying out such inspection as they
require in the sheds, and having a locked enclosure therein for their own use.
This method is one of general application in the majority of ports.

When this improvement has been carried out, the system at the port will be
similar to that existing at Kilindini before the working of the sheds was handed
over to the agents of the shipping companies. This situation can by no means
be described as an ideal one, but I would hardly feel justified in recommending
that the Government, with the pressing demands on it for funds for other public
services, should at the present time incur the expenditure required to buy up the
lighterage concerns.

With the advent of better trade conditions, the lighterage companies will
probably find it to their advantage to reduce their charges in order to expedite
the development of export trade, and at the same time the fact that the Railway
Headquarters are situated at Dar-es-Salaam should ensure that full attention is
paid to the importance of quick despatch and prompt clearance in the sheds.

CHAPTER IX. – RATES.

273. The goods rates in force on the Tanganyika Railways have been framed
on the old German tariff book in use before the War. The rates are tapering in
accordance with normal practice. The classification contains six classes, with the
first as the highest class. At the time of my inspection the only special rates in
force were for country grains and meals from the Tabora and Dodoma Districts
to Dar-es-Salaam, and for coffee in truckloads from Moschi to Tanga.

For truckload consignments of certain articles lower classification than in
the case of small consignments is granted; the articles are further graded as A, B
or C, according to the maximum weight for charge; for items under heading A
a truckload is charged at half the carrying capacity of the truck supplied; under
heading B at 80 per cent. of the carrying capacity, and under heading C at full
carrying capacity.

Thus, in the case of local dried beans, while small consignments are charged
at Class Rate No. 5, truckloads are granted Class Rate No. 6.B, and the weight
carried is calculated as being 80 per cent. of the capacity of the truck supplied.

It will be seen, therefore, that, with the exception of the two special rates
given above, all exports as well as imports were carried at classification rates.

Exports.

274. While the taper in the rate is sufficient, generally speaking, in the case
of import rates, and also in the case of exports such as cotton, cotton seed and
seisal, which are not produced at a greater distance than 320 kilometres (or 200
miles) from the coast, once exports have to be brought over long distances, such
as Tabora, 841 kilometres, (or 525 miles) or Lake Tanganyika, 1,244 kilometres
(or 775 miles) the taper is insufficient and the rates very soon become prohibi-
tive. For this reason, although a classification rate may suit quite well for a low
grade export which has to be carried only a short distance, once it is necessary
to haul it a long distance, a special rate will be required, in order to enable that
export to compete in the world’s markets.

As explained in the Introductory Chapter, the only zones on the Central
Railway from which exports can be expected are the coastal zone, stretching for
approximately 283 kilometres in from Dar-es-Salaam, the zone of 100 kilomet-
tres on each side of Tabora, and the basin of Lake Tanganyika. For the majority
of the exports, therefore, from the two last-named zones, it is necessary to intro-
duce special zone rates. Such rates should apply only to consignments which are
bona fide for export, the neighbouring Territories of Kenya and Zanzibar not
being included. Consignments for consumption in Dar-es-Salaam would not,
of course, be granted the same special low rates as exports; rates either ‘zone’ or
‘tapering,’ intermediate between the export and the classification rates, should be
framed which would enable such commodities to be marketed at Dar-es-Salaam.

Exports in particular for which I considered special rates were required were
ground nuts and millet from the Tabora District, rice from the Tanganyika
Basin, and ground nuts, palm kernels and oil seeds from the Belgian Congo. The
export of ground nuts from the Tabora District was also aff
 lokted by the tempo-
rary reduction of the ground nut rate on the Uganda Railway system to 70 cents
per 100 lb. from all ports on Victoria Nyanza. As explained in Part I., Chapter
XII., para. 178, these reduced rates were put into force as a temporary measure,
in order, if possible, to enable these commodities to find a market at the low
prices then ruling; unless a low rate was quoted, there was reason to anticipate
that it would be impossible to export them. and thus the traffic would be entirely
lost to the Railways. /

The area to the North of Tabora, where ground nuts are produced, stretches
up to Mwanza, on Victoria Nyanza, so that normally the Northern half of the
area would export via Mwanza, and the Southern via Tabora. If a much reduced
rate is put into force on the Lake steamers, they would naturally attract any traf-
fig which there might be to the detriment of the Central Railway. On the other
hand, if equal export rates to the respective coast ports are quoted from the two
points, Tabora and Mwanza, the traffic will naturally gravitate to whichever of
the two is easiest of access to the point of production, and the most expensive
portion of the journey, the transport by road, will be cut down to a minimum.
For this purpose it was necessary to equalize the export rate between Tabora
and Dar-es-Salaam to the same figure as was obtaining between Mwanza and
Mombasa.
After careful consideration of these factors, special rates were framed in consultation with the General Manager which were submitted by him on the 1st August to His Excellency the Governor for adoption with effect until the end of the year.

In addition, it was proposed that the rates on hides and skins should be reduced from Class 3 to Class 4 in the case of small consignments and from Class 4 to Class 5 in the case of truck loads.

These export rates were made applicable also to produce from the Belgian Congo.

Amended and reduced tariffs for local grains and rice (not for export) to Dar-es-Salaam were put forward at the same time.

275. In any future tariffs which are framed, particular attention will have to be paid to rates on unginned cotton. This commodity gives very bad loading, and cannot stand a heavy rate for transport. At the same time, it is necessary to grant it special rates so that the raw cotton can be taken to the ginneries. On the Central Railway, the maximum distance inland at which cotton is produced in marketable quantities is 280 kilometres. The only ginneries so far established are at Morogoro, kilometre 202, and Ngerengere, kilometre 145. Care should be taken that special rates for raw cotton to ginneries should be granted only over short hauls, say up to a limit of 80 kilometres, because, if special reduced rates are given for raw cotton over long hauls, there will be a tendency to establish ginneries at the coast instead of close to the point of production. The Railways would then lose materially as the only traffic left would be the raw cotton with all its disadvantages of bad loading and low rates.

276. Although in general the taper on the classification rates, and the rates themselves, appear suitable in the case of imported articles, I consider that the following adjustments could be made with advantage.

Agricultural and other machinery is at present placed in the 4th Class. It is in the interests of development that low rates should be granted to this, and I would recommend that it should be placed in the 5th Class, i.e. the lowest but one of the classification rates.

Paints and colours are placed in the highest class rate, which appears too high, bearing in mind the low value of the commodities. I recommend that they be lowered to the 2nd Class. This rate would still be a high one, and it may eventually be found expedient to lower it still further.

Petrol is classed similarly in the 1st, or highest Class. Such a rate is nearly prohibitive for long hauls; for example, the cost per ton from Dar-es-Salaam to Tabora is 357 florins per ton, or from Dar-es-Salaam to Kigoma 490·50 florins per ton. It would pay the Railways to lower this rate substantially. I would recommend that the classification for small consignments should be 2nd and for truckload consignments 3rd. The cost of freight to Tabora and Kigoma would
then be for truckload consignments 163 florins per ton and 209·5 florins per ton respectively.  

*Rice* is produced locally, and it is in the interests of the Railways to stimulate that production. Imported rice is at present placed in the 4th Class, whereas imported wheat is in the 3rd Class. I would recommend that imported rice should be raised from the 4th to the 3rd Class.

*Tea and Tobacco* are at present in the 2nd Class; both are commodities which can stand a high rate, and I think they should be raised to the 1st Class.

*Cotton Goods* are placed now in the 3rd Class; these are articles for which there is a large demand, and an increase in the rate from 3rd to 2nd would not materially affect the demand, while it would mean a distinct gain to the Railways.

*Matches.* For similar reasons I consider Matches should be raised from the 4th to the 2nd Class.

277. In para. 225, Chapter II., relating to the Traffic Department, I have recommended that goods in the two highest classes, namely, the 1st and 2nd, should only be accepted at Railway risk, and that the rates quoted for these should be the same as in the present tariff book, and that for the four lowest classes the rates given should be at Owner’s risk; where a merchant wishes to consign at Railway risk, the rate should be 10 per cent. in excess of the ordinary Owner’s risk rate. The reasons for this recommendation are fully explained in the paragraph quoted, and in para. 29, Part I.

278. On the Tanga Railway, the classification and rates to be finally adopted must depend on the policy decided upon for the future of the Voi-Kahé link. Any portions of this system which are administered by the Uganda Railway or connected therewith should eventually have the same classification and rates; for any portion which is not so connected a separate classification, such as that obtaining on the Central Railway, can be used.

279. The Uganda and Tanganyika Railways at the present time both serve the area lying between Mwanza and Tabora, and in the future, if a steamer service on Lake Tanganyika is developed, the central regions of Urundi may quite possibly be able to export either *via* Victoria Nyanza or Lake Tanganyika. Any attempt at competition between the two systems for such traffic could not be permitted; the Managements must arrange to balance their rates at these points in such a manner that the traffic will go to whichever of the two systems is most conveniently placed to the point of production, and so give the produce the easiest and cheapest route to the sea. In the case of Mwanza this would affect indirectly the rates from other ports on Victoria Nyanza, and in the case of Tabora any intermediate stations to Dar-es-Salaam which handle the same commodities. It is, therefore, of great importance that the two General Managers should consult
each other and come to a mutual agreement before the introduction of any rates
affecting these particular areas. / 

CHAPTER X. – GENERAL.

280. As explained in Chapter I., Introductory, under the German Administra-
tion in force prior to the War, the Ost Afrikanische Eisenbahn-Gesellschaft
(O.A.E.-G.) was kept in existence to run the Central Railway, although practi-
cally the whole capital belonged to the Government. While the land concessions
which had previously been granted to it, when it was a private concern, were
transferred to another company, the O.A.E.-G. itself retained the lands which
it was occupying, and certain other lands which were considered necessary for
future expansion in the neighbourhood of the main line, in connection with
such requirements as housing or shop extensions.

This policy is conceived on sound lines as it recognises that land which may
ultimately be required for railway purposes should not be disposed of without
the knowledge or consent of the authorities responsible for the administration
of the Railways. If these lands are treated on the same footing as ordinary Crown
Lands, they are liable to be disposed of without due attention being paid to the
needs of the Railways, because a Lands Department is apt to regard such mat-
ters from a different viewpoint to the Railways, whose interests will suffer in
consequence.

I recommend that the policy should be continued, and that all lands pre-
viously allocated to the O.A. E.-G. should be definitely earmarked as ‘Railway
lands;’ and it should be recognised that they cannot be alienated for any other
purpose without the consent of the General Manager.

The necessity of making stipulations of this nature was recognised by the
Secretary of State as regards the Uganda Railway; in that case a ruling was given
in 1906 that no lands in the Railway zone could be alienated without previous
consultation with the General Manager, and, in case of disagreement, the matter
had to be referred to the Secretary of State for settlement.

Whether actually administered by the Lands Department or not, it would
be advisable to treat these lands as assets of the Railway, and to credit it with any
profits arising from their disposal, because the Railway should be treated as far
as possible as a separate commercial entity to be run on proper commercial lines.

281. Under the Convention drawn up with the Belgians on the 16th March,
1921, in addition to the Articles granting rights of freedom of transit, exemption
from customs dues for goods in transit, &c., Belgium has the right to employ her
own trucks on the Central Railway for the transport of goods between the Bel-
gian Congo and the sea, provided such trucks comply with the conditions of the
British Authorities regarding weight, dimensions, brakes, &c. The British Gov-
ernment further leases, at a nominal rental, sites at the ports of Dar-es-Salaam and Kigoma to the Belgian Government. These sites can only be utilized for goods in transit, and conditions regarding the general regulation of these sites, buildings thereon and charges which may be made by the Belgian Government for the use of any site or works thereon are also laid down.

Sites at both ports have now been definitely allocated and occupied. The site at Dar-es-Salaam does not call for any comment. At Kigoma, the ‘concession’ constitutes the best portion of the port; being situated between the remainder of the port and the main line, all traffic to or from the former has either to pass through the ‘concession’ or else round the back of it, and then over an awkward back shunt; this makes working difficult. The future prospects of the Central Railway are so closely connected with the traffic to and from the Congo that every means should be seized to foster it, and from this point of view it is a good thing that such an excellent site has been granted, but as traffic increases it will probably be found necessary to press for some modification regarding the landward portion of the site, in order to improve the working facilities to the remainder of the port. As the provision of such facilities would also assist the working of traffic inside the ‘concession’ itself, it should not be difficult to come to some arrangement, but the ultimate necessity for such development should be borne in mind when any question of the erection by the Belgians of permanent structures on this portion of the site is mooted.

282. It is important that the facilities given to British firms wishing to trade with the Congo should not be so inferior as to place them at a disadvantage with foreign firms making use of the ‘concession’. In this connection, the importance of customs regulations and practice should not be lost sight of. Under the Convention, the Belgians have the right to despatch sealed trucks in either direction, and these trucks will be exempt from all British Customs formalities, British Customs Authorities having the right to be present when the seals are affixed. Further, for such goods in transit to or from the Congo through the two ports as do not pass through the conceded site, on preliminary fees, deposit payments, or other pecuniary guarantees may be imposed by the British Customs. In this manner, the passage of goods in transit from firms situated outside the Territory will be expedited; unless British firms situated in the country are given equivalent assistance in Customs formalities their trade with the Congo will be handicapped. It is important, therefore, that all Customs formalities in connection with the despatch of goods to and from the Territory itself, and more especially Dar-es-Salaam, should be made as simple and expeditious as possible; otherwise, the whole trade with the Congo will be deflected to firms situated outside the Territory, many of whom are bound to be foreign, and British trade will suffer.
283. The clause in the Convention which permits the Belgians to place their own trucks on the Railway, provided they comply with the specifications of the British authorities, assumes particular importance at present, owing to the announced intention of the Belgians to embark on a large development scheme in the Congo.

This programme, I am informed, embraces Railway construction, steamer services and water-power schemes, and is calculated to entail an expenditure of approximately £20,000,000. In addition to the import of the material required under this programme, they hope to export about 2,000 tons a month. With their present resources, even after making allowance for the surplus stock of locomotives, the Tanganyika Railways are not in a position to handle so large a traffic. If they are unable to do so, it is open to the Belgians to provide their own trucks for the purpose.

It would not be to the advantage of the Railways to have foreign-owned trucks on the line, because they would have to be kept primarily to the transport of Congo traffic, and would not be generally available for other work. In any event, when used for other traffic, hire would have to be paid to the Belgians for their use, and when used for Belgian traffic, reduced freights only could be charged. There would be further difficulties in respect of the maintenance and repair of these vehicles.

It is, therefore, in general to the interest of the Railways to provide at their own expense the trucks and locomotives required.

At the same time, the Railways cannot launch out into large capital expenditure on rolling stock merely on the vague expectation of a large programme of development which may not materialise. Something more definite than a mere anticipation is required. / The expenditure of so large a sum as twenty million pounds must necessarily occupy some years, and entail the laying down of a definite programme for that period during which the Belgians should be in a position to state what their total traffic requirements are likely to be.

The best course for the Tanganyika Railways to pursue would be to get into touch with the Belgian authorities and to obtain from them a definite guarantee of a certain tonnage, if possible covering the whole period of the programme. On the strength of this the General Manager can calculate what additional locomotives and trucks he will require. If the programme only extends over a short period, such as three or four years, it might be found that the net profits accruing would not compensate the Railway for the purchase of the stock, but this point can only be determined when data are available.

If it is decided that it would pay the Railways to provide the stock themselves, funds should be provided and the Belgians should be asked to enter into a bond to guarantee a certain minimum traffic, as in the case of private firms. If
it is decided that it would not pay the Railway to purchase the new stock, the Belgians should be informed accordingly. It might be advisable also to allow the Belgians to place their own locomotives on the line to be run and maintained by the Railway Administration, although they do not appear under the Convention to be able to claim this right.

284. The Tanga Railway and the Voi-Kahé link form at the present time a distinct and separate system, that is to say their returns, expenditure and accounts are compiled separately. Each branch, Traffic, Locomotive, Engineering and Stores, is under the charge of a District official, and the accounts are drawn up locally by an Assistant Chief Accountant. Each of these District officials is responsible directly to his Departmental chief at Dar-es-Salaam, and any question at issue between Departments has to be referred there. Communication between Tanga and Dar-es-Salaam is maintained by a weekly service of runners, and therefore a long time is bound to elapse before such questions can be settled. I am of opinion that there would be a distinct gain in efficiency if one of the District officials were appointed Local Superintendent, with definite powers delegated to him by the General Manager over other Departments, and also in the matter of claims, dealings with the public, and fines. He could perform these duties without difficulty in addition to those he has already in connection with his District work, and might be granted a duty allowance of £50 a year to compensate for the extra responsibility.

285. I have explained earlier the necessity for mutual agreement between the General Managers of the Uganda and Tanganyika Railways as regards rates from areas which are served by both Railways. It is important also that uniformity should be maintained in such matters as the conditions of carriage, standards, conditions of service and staff questions; moreover, as many of the larger firms are established in both territories, uniformity of conditions tends to simplify and expedite business. I would recommend that an official conference should be held annually between the two General Managers at which all such matters could be discussed; it would be open to either to place on the agenda such items as he considered of mutual interest or importance, and the agenda should be prepared sufficiently in advance to allow both parties to study the questions before the conference begins.

Official minutes should be kept, but any decisions which require ratification by a superior authority would not be binding until such ratification had been given. The conference might be held in alternate years at Nairobi and Dar-es-Salaam.

286. The arrears in the Accounts Department, and more especially in the Stores Branch, at present make it impossible to obtain prompt returns of expenditure. The General Manager informed me that his intention was as soon as the arrears have been made up to have monthly returns of approximate expenditure
prepared, and available for use within a fortnight to three weeks of the end of the period to which they relate. I attach great importance to the value of such returns, and of statistics showing the working costs per unit of work performed, provided they are rendered with sufficient promptness to allow action to be taken without delay; the improvements which I have recommended for adoption in the Accounts and Stores Departments will assist in this direction. These returns can then be compared with the previous month and with corresponding months in previous years, not only for the whole system, but also for individual departments. By this means, a tight hold can be kept over expenditure, and any tendency to extravagance or waste checked promptly.

287. The present state of the accounts and the uncertainty as to the amount which will have to be paid to the Military Administration for stores taken over, make it impossible to enter into any close review of the financial situation.

The outstanding feature is that the revenue falls far short of what is required to meet actual working expenses exclusive of renewals or loan charges.

The loan charges on the Railways are fortunately very light because the only ones which will have to be met are those on the equipments and stores handed over by the Military Administration, and none will have to be paid on the cost of original construction. The Railways may also be called on to pay interest on the funds provided to cover the deficit on working.

The deficit on working for 1921–22 is estimated to be at least £200,000; it is not possible to expect that such a sum can be covered by the economies or recommendations proposed in this Report. The cause for this heavy loss is to be found in the very poor traffic which the two Railways are carrying while the expenses of maintaining a system of 1,747 kilometres (1,092 miles) long are bound to remain high, however reduced the service may be. Although the present depression, of course, is responsible to a certain extent, a return of normal markets could not be expected to right matters.

In the case of the Central Railway the German Administration showed a profit on working prior to the War, but this was due solely to the heavy construction traffic which was being carried. The construction of the main line was only completed in 1914, and by that time the construction of the branch northwards from Tabora had already been begun, and platelaying had commenced. Full credit was given to open lines for the carriage of the large quantities of construction material required, and the revenue thus obtained was the only reason why the Administration was able to show a profit on working the main line. Without this revenue there would have been a heavy loss, though how large it is impossible in the absence of accurate figures to state.

The reason for the poor traffic return is not difficult to find; leaving aside the first 280 kilometres of the coastal zone, where the traffic prospects are good, the Central Railway for the remaining 960 kilometres of its line passes through
country of which, excluding the salt works at Usoki, only 120 kilometres, or approximately one-eighth, can be considered as possible of producing a paying traffic. It is impossible to expect any railway to pay under such geographical conditions, and the prospect of deficits for many years to come will have to be faced. The chief hope of turning these deficits into profits, or at any rate of reducing them, lies in the development of the basin of Lake Tanganyika, and the trade with the Congo. / The opening up of the mineral deposits which are known to exist would have the same effect, but until some more definite information as regards the extent and quality of the latter is obtainable, it would be unwise to indulge in any anticipations regarding the traffic.

The prospects on the Tanganyka Railway are brighter; this Railway has already carried a paying traffic over the first 130 kilometres to Mombo. Over the next 45 kilometres to Buiko, development had been already commenced by the Germans and this section would probably have already reached the remunerative stage, had it not been for the War. Unfortunately, as a result of the War, and the delay in the liquidation of enemy properties, the cultivated areas have reverted to a condition where it is probably harder to clear and replant than in the case of virgin land. It is estimated locally that this section of 175 kilometres will take 5 to 7 years to reach its pre-War output, but there is no doubt that it will eventually once again be a paying proposition throughout its length.

If the recommendations which I have made as regards the future of the Voi-Kahé Military Railway are adopted, the Tanganyka Railway will terminate at kilometre 283; the last 108 kilometres beyond Buiko run along the slopes of the South and Middle Paré Mountains through excellent country, which eventually, when developed, should produce a good paying traffic. It may, therefore, be reasonably anticipated that eventually the Tanganyka Railway will throughout its length produce paying traffic and show a profit on working, but 5 to 7 years must elapse before this can take place, and in the meanwhile the probability of annual deficits must be faced.

For reasons which are fully explained in Appendix I., Part I., I have recommended that the Moschi-Arusha area should be connected to Mombasa, rather than Tanganyka. The prospects of this area are more promising than those of any other area adjoining either the Central or the Tanganyka Railways, and in a few years the Tanganyka Government may reasonably expect, provided markets return to a normal state, to receive a profit on the outlay which it will have to incur in the reconstruction of the Voi-Kahé Railway; but it would be prudent to anticipate a loss during the initial years, and, even when the line is returning a profit, it would be unwise to expect that this profit will be sufficient to compensate for the loss on working the Central Railway.
To sum up, while the Tanga and Voi-Kahé Railways show reasonable prospects of becoming paying concerns, once markets have recovered, and the local effects of the War and the delay in liquidating enemy property have been overcome, the working of the Central Railway must be expected for many years to show annual deficits which will be much larger than any profits which may be expected to accrue from the first two named. The steps which should be taken to foster the trade with the Tanganyika Basin and the Congo, on which the main hope lies of converting the Central Railway into a paying concern, are dealt with in Part III., Future Development.

288. So long as the gross receipts do not cover the ordinary working expenses, it is useless to talk about the establishment of a renewals fund; replacements will have to be effected out of funds found from the budget of the Territory, as and when they become economically necessary. But once the corner has been turned, and gross receipts show an excess over expenditure, I would urge most strongly, both in the interest of the Territory and of the Railways, that proper renewals funds should be started, and replacements should not be allowed to depend on the temporary exigencies of the budget of the Territory, or the capacity of the General Manager to wring money out of the local Treasurer.

The present situation on the Uganda Railway has brought out so clearly the dangers lurking in that policy that it would be very regrettable if the same mistake was repeated in the neighbouring Territory. / [...]

PART III.

FUTURE DEVELOPMENT /  

Report  
ON THE  

FUTURE DEVELOPMENT OF THE RAILWAY SYSTEMS OF KENYA, UGANDA AND TANGANYIKA.

289. In any consideration of the future development of the transportation services in countries like Kenya, Uganda and Tanganyika, whose future prosperity depends solely on their capacity to export raw products, the question of ports is one of the first to demand attention. Whilst during the initial stages simple arrangements suffice, as trade increases and development pushes further afield the need for improved facilities such as are to be found in a modern deep-water port makes itself felt. The benefit of these facilities, once there is sufficient cargo to justify them, should make itself felt in two ways; the cost of handling cargo at the port should be less owing to the decrease in the number of times the goods have to be handled, and freights should become lower as ship-owners are assured of a quick discharge and less delay to shipping. The provision of these facilities, however, is a costly matter, and there must therefore be a considerable trade passing in order to cover expenses and charges on capital. The greater the trade passing through, the lower the handling charges should be, and the lower the handling charges are the greater the distance inland from which it will pay to export. From the shipping point of view also, it is advisable to direct the bulk of the traffic to a few well-equipped ports rather than to a series of small poorly-equipped ones. It thus becomes a necessity to concentrate on one or two big ports, and to direct the policy of railway development accordingly. That portion of the coastal zone which is not close to these ports can continue to use the smaller ports, the goods being brought from there to the main ports by coastal
craft in cases where regular steamers do not call at the ports. As the exports from this zone have only a short distance to be hauled on land, and the comparative cost of their land transport is therefore small, they can stand the additional charges of this extra handling and transhipment.

This necessity for concentrating on a few ports and spending all the money available on them is the principal reason for my recommending that the Voi-Kahé Railway should be reconstructed and made permanent, and that the area round Moschi and Arusha and their hinterland should evacuate its products via Kilindini instead of via Tanga. If Tanga was to be recognised as the port of exit for these regions, sooner or later a demand must arise for improved facilities and heavy capital expenditure, while within 70 miles there would be another port, Kilindini, which already possessed the necessary facilities and on which large sums had already been spent. And in the interval the inhabitants of the regions served would be suffering because, instead of being allowed to make use of a modern port with low charges, they would be compelled to use a port possessing the disadvantages of lighterage and high handling charges.

The policy to be adopted should therefore aim at developing the two principal ports, Kilindini and Dar-es-Salaam, as much as possible, and directing as much of the traffic through them as possible. Tanga would remain as the port for the small area stretching inland as far as Samé, and its existing equipment will suffice for the needs of this district for an indefinite period. Lindi similarly would be the port for the coastal zone which it taps.

290. The two main systems centring on Kilindini and Dar-es-Salaam are best described by the analogy of a large river system. The basin served by the former would include the Moschi and Arusha areas and any subsequent extension towards the South-east corner of Victoria Nyanza; the whole of Uganda and Victoria Nyanza is also included in this ‘basin,’ and the ‘traffic watershed’ between it and the Dar-es-Salaam ‘basin’ would be along a line passing midway between Mwanza and Tabora and to the North of Kondoa Irangi until it finally meets the boundaries of the small Tanga ‘basin.’ The Southern boundary of the Dar-es Salaam basin would correspond very closely with the Eastern watershed of the Rufiji River down as far as the Pangani Rapids.

291. While the line of demarcation between the two systems can thus be laid down it is to the interests of both to push their connections, or at any rate the influence of their connections, as far West as possible in order to attract as much traffic to their respective systems as possible.

If the recommendation which I have made that the Lake Albert Marine and the motor service between Masindi Port and Butiaba is adopted, the Kilindini or Uganda Railway system will have under its control a direct line of communication through to the Belgian Congo. Here, however, it comes into competition with two other routes, one via Rejaf and the Soudan, and the second via Stanley-
ville, the Congo and the Matadi or Brazzaville Railways. The advantages which the Uganda Railway has in competing for the traffic to the goldfields in this area are shorter transport by road, shorter distance to the coast, and the fact that its route will be under one control. The disadvantages are the number of transhipments en route, and, for the time being, the low value of the Belgian currency. While these advantages should be sufficient to secure to the Uganda Railway this traffic for the time being, the situation will no longer be so favourable if the Belgians build either the Moto-Rejaf or Uele Railways.

Both these routes, if and when completed, would be able to offer better terms than the present Uganda Railway route, owing to its numerous points of transhipment, can offer, and therefore the latter must be regarded as a temporary expedient to capture and pin down this increasingly important traffic until a better connection through Uganda is made.

This connection can take either of two routes, connecting Kampala on Victoria Nyanza, with either the North or the South end of Lake Albert. From reconnaissances made in 1911, the feasibility of both routes has been determined.

In comparing the two, the advantages appear to lie altogether on the side of the Southern route. Whereas the Northern route would have to cross the Nile twice, once close to the Murchison Falls and a second time north of Lake Albert; the Southern route has only to cross the Semliki once, probably a much cheaper operation. While the traffic possibilities along the immediate path of both appear about equal, and both would tap equally the well populated area between Kampala and Hoima, the Southern route would open up the promising upland country round Fort Portal, where the best coffee producing land and the only land suitable for white settlement in Uganda is situated. Also, if the Southern route were chosen, the north-west and centre of the Protectorate would still be served by the existing service, whereas if the Northern were selected, the Western areas would not benefit at all. Before coming to a decision, the views of the Belgian Congo Government would have to be obtained, and an agreement would have to be reached with them, so that they could continue the line on their side of the frontier. There do not appear to be any insuperable difficulties in the continuation of either route beyond the frontier, and there is every reason to believe that the Belgian Government would be well disposed towards the construction of a through connection.

With a railway through from Kampala or Port Bell to the Belgian frontier, the Uganda Railway would be in a much better position as regards the goldfields than either of its rivals. Transhipment would still have to be done at Port Bell and Kisumu, but both the other routes would also have two points of transhipment, while the Uganda Railway would have the advantage of a shorter route and unified control right through to the sea.
The importance of a railway along this route was recognised before the war, and funds had been earmarked for construction between Kampala and Mityana, but the war interfered and work was not commenced. I consider that this project is the first which should receive the consideration of the Uganda Government. Under the terms which I have recommended in Para. 199, Chapter XV., Part I., the Uganda Government would be called on to provide the capital necessary, while the branch would be credited with the profits on all traffic brought to the main line as far as destination. The Government would bear any loss on the undertaking during the early years, after working expenditure, renewals and loan charges had been allowed for; this net loss, together with accrued interest thereon, would be repaid to the Protectorate from any net profits subsequently earned by the branch after it had become a paying concern. These terms are much better than those allowed when the Railway from Kampala to Mityana was first contemplated, and to that extent improve it as a financial proposition from the point of view of the Uganda Government.

292. When this railway from Kampala to Toro has been constructed, and as the traffic with Lake Kioga and the Congo increases, the question of continuing the Uasin Gishu branch (now under construction) to Uganda is bound to arise. The distance separating Turbo, the proposed terminus of the Uasin Gishu branch, from Jinja is only 150 miles, and sooner or later this link in the chain is bound to be completed and a through railway built. In all decisions taken respecting the Uasin Gishu branch, or any future extension of it, the fact must be always borne in mind that it is ultimately bound to form the main line to Uganda and the Congo.

Any such branch would probably be constrained by geographical reasons to cross the Victoria Nile close to Jinja, as there are several excellent bridge sites between the Ripon and Owen Falls. As the country to the north of this connection between Turbo and Jinja is better and more populous than to the south, it will probably be found advisable to keep it as far north as the slopes of Mount Elgon and the swamps of the Mpologoma allow, thus passing to the north of Soy and avoiding the vicinity of Victoria Nyanza.

The completion of this connection will leave the portion between Kampala and Jinja as the only link to be built in the through connection to the Congo, although it is possible that the internal development of Uganda will result in this portion being completed before the Turbo-Jinja connection. / 293. Factors which will hasten the demand for these through railways will be a return to normal markets and such an increase in trade from Uganda and the Congo as to warrant an increase in the existing fleet on Victoria Nyanza. At present this fleet is largely in excess of requirements, but when trade has increased to such an extent as to call for the purchase of more steamers, the question will have to be thoroughly examined as to whether Kisumu, with all its disadvantages
of shallow depth, should be retained as the Marine base, or whether the through connection by rail to Jinja should not be undertaken at once, a new Marine base being established at Jinja. So long as Kisumu is the base, small and uneconomical craft have to be used, whereas at all the other principal ports steamers of 12 foot draught could be employed.

With the construction of a through railway, the Marine service would cease to be a portion of the main system carrying the Uganda and Congo traffic, and would merely act as a collecting agency for traffic from the vicinity of the Lake. For this decreased service the fleet, relieved of its duty of carrying the through traffic, might be found to suffice temporarily without any increase, and Kisumu might be retained for the time being as the base. As this service itself increases, or steamers become due for replacement, craft of greater draught could be purchased, and Jinja could form the base, the plant and workshops being transferred from Kisumu. The shallow draught craft and the Nakuru-Kisumu section would then serve merely the vicinity of the Gulf of Kavirondo, and the area tapped by that section of the Railway.

The completion of this programme of development would leave the Railway in possession of a trunk line through to the South end of Lake Albert with a branch service, mixed rail and steamer, as at present to the North, tapping the basin of Lake Kioga and the central portion of Uganda, a deep-draught Marine service based on Jinja serving the main ports on Victoria Nyanza and a shallow-draught Marine service based on Kisumu for the Gulf of Kavirondo and the smaller ports, the last named service probably in time being confined to tugs and lighters.

It is important in view of these possibilities that capital expenditure at Kisumu should be confined for the time being as far as possible to what is removable, such as plant.

294. The extensions which have up to date been proposed within the Colony of Kenya itself are, excluding the Uasin Gishu branch, which has already been decided on, the Nyeri Railway, a branch north from Gilgil to Rumuruti, and the extension of the Uasin Gishu branch to the Trans-Nzoia.

Under the terms for the construction and administration of branch lines which I have recommended in Part I., any loss on working such branches, including adequate allowance for renewals and loan charges, would be borne by the Colony, and such terms would apply in these cases to Kenya, just as in the case of the branches mentioned earlier this loss would have to be borne by Uganda, and in the case of the Voi-Kahé Railway by Tanganyika.

In the Report of the Chief Engineer in charge of Surveys and Construction, the net revenue derived from the Uasin Gishu Branch ten years after completion, including full allowance for profits on traffic on the main line, is estimated at £112,000. This figure makes no allowance for renewals funds. Taking the esti-
mated cost of construction and rolling stock at £2,700,000, the loan charges will amount to £259,848, leaving a deficit of £147,848, excluding the annual sums which will have to be put by for renewals. / 

The question, therefore, is how soon will the Colony be in a position to face, in addition to this, the extra burden which would be imposed by the loss on working any of the other proposed branches during their early years. I do not wish to imply that these projects in themselves may not possess admirable prospects for the future, but during the early years of working there are bound to be losses. I have shown clearly in Part I. that these losses cannot be borne by the Railway finances, and, further, that it is unjust to the other users of the line to expect them to be borne in this manner. The possibility of their commencement must, therefore, await the time when the Government of the Colony considers itself in a position to support these losses in addition to any losses which may still be falling due on the Uasin Gishu branch.

295. The extension of the Moschi-Voi branch in the direction of Arusha must similarly wait until the Tanganyika Government considers it is in a position to bear the initial losses on working the extension in addition to any which may still be resulting from the working of the Moschi-Voi branch. There is, however, a small extension of this branch which deserves special consideration. During the war a short line, 31 kilometres (or about 20 miles) long, was built in the direction of Arusha, from a point on the Tanganyika Railway 10 kilometres (or 6½ miles) south of Moschi. Subsequently, the material, except for the first 6 kilometres, was picked up and sent to another theatre of war.

The trade from the Arusha area is at present handicapped by having to pass through a narrow belt of ‘fly’ country between the Sanja River and Moschi, in consequence of which the cost of transport between Arusha and Moschi is as high as Fls. 4.50 per load of 50 lbs. The Sanja Railway extension passes through and out of this fly-belt, so that if it was relaid the cost of transport from Arusha would be very considerably reduced.

The cost of the reconstruction of this short length is estimated at £4,800 exclusive of the cost of the permanent way material and its freight on the Railway. The quantity of spare permanent way material left by the Military Authorities on the Tanga Railway is far in excess of maintenance requirements; there is in fact sufficient to relay the 25 missing kilometers of the Sanja extension and leave a sufficient margin for maintenance purposes. The price of this material has not yet been fixed, but, whatever the price may be at which it is eventually decided that the Railways have to take it over, the cost of the material will have to remain as a charge against the stores suspense account, and interest charges will have to be paid on that cost price. On the other hand, if it is used in reconstructing the Sanja branch the cost will be transferred to Capital Account, and interest charges will still have to be paid, but the material will be earning revenue, instead
of merely lying idle in the Stores. If, as seems probable, the Railways have to take over this surplus permanent way material, it would certainly appear a sound proposition to use it in this manner especially as, apart from the price of the permanent way material, the cost of reconstruction will only be £4,800, and of freight by rail £2,800, or a total of £7,600. There is the further advantage that this realignment could be used for any subsequent extension to Arusha.

I would therefore recommend that this extension should be sanctioned and put in hand if it is definitely decided that the surplus material has to be taken over.

In considering the possibilities of the Dar-es-Salaam or Central Railways basin, the most striking feature, as pointed out in Part II., is that on the existing trunk line, apart from the coastal zone of 280 kilometres (or 175 miles), and the zone of 100 kilometres (or 60 miles) round Tabora, there are no possibilities of obtaining a paying export traffic until the basin of Lake Tanganyika is reached. The Germans had already commenced a railway from Tabora northwards and then westwards to the elbow of the Kagera River, passing by St. Michael, whence a branch was eventually to be built to Mwanza. The object of this railway was to tap the rich districts of Ruanda and Urundi, and to divert both this and the traffic from the Mwanza District from the Uganda Railway Marine. With the absence of any motive for competition, the _raison d’être_ of this line has disappeared. Rich districts such as the Turanyi lie to the north of the main line, but they are a considerable distance from it, and are separated by belts of fly country forty miles broad, which make the cost of transport very high. At the same time their present possibilities of export would not justify the construction of a railway to them. To the South-west of Ngerengere are coal deposits, and to the South-west of Kilossa are deposits of copper and mica; both, when developed, may produce good paying traffic for the Railways, but until proved and opened up it is impossible to base any expectations on them. The chief hope therefore of the Central Railway must be centred on Lake Tanganyika and the Congo traffic. The big lakes, although they have the disadvantage of acting as obstacles to through railway construction, have the great advantage of forming admirable ‘catchment areas’ for traffic which can be developed at comparatively low cost. On Lake Tanganyika the Belgians have three steamers already at work, while the only British craft are two launches, the ‘Fifi,’ capable of carrying three tons, and the ‘Mwanza,’ which is slightly larger.

In addition to the trade with the Lake Basin and the Congo, the Central Railway, if supplemented by a service on the Lake, forms the natural and shortest route to North Eastern Rhodesia. The present route from the sea to North Eastern Rhodesia is _via_ Beira, Salisbury, Bulawayo and Livingstone, and thence either _via_ Broken Hill with a land carriage to Abercorn of over 500 miles, or _via_ Ndola on the Congo-Rhodesian frontier by land 75 miles to Kabunda, thence
14 days by the River Chambesi, and finally a further 150 miles by land to Abercorn. The distance from Beira to Abercorn by this route is 1,825 miles as against 1,065 from Dar-es-Salaam via Kigoma. The respective distances from London by the two routes are 9,665 and 7,825 miles respectively. As, in addition, Abercorn is only 15 miles from Lake Tanganyika, it is obvious that the natural route to the whole of this portion of North Eastern Rhodesia is via the Central Railway, and it is important in the interest of that Railway that the traffic from this country should be obtained. It is necessary however in order to obtain it that the Government should establish a marine service on Lake Tanganyika.

297. Fortunately the Government is in a position to establish a British service on the Lake at a moderate cost, assuming the necessary funds are provided. Just before the War the Germans put into commission a 600-ton steamer called the ‘Von Goetzen,’ fitted for passenger and cargo work. During the War they sank her in the Malagarassi River; the Belgians attempted to salve her, but only succeeded in getting her round to Kigoma where she again sank. She has now passed into the possession of the Tanganyika Government. The cost of salving and reconditioning is estimated at £35,000, including the repayment to the Belgians of the moneys spent by them. As the cost of a new steamer would be at least £60,000, the opportunity thus offered of inaugurating a British service on the Lake at such low cost is one which should be seized, and I have no hesitation in supporting strongly the request of the Government of Tanganyika that the necessary funds may be granted. The necessary workshop equipment is already installed at Kigoma; a slipway had been built there also by the Germans, but the winding gear had not been erected and is missing.

The Marine Service should be amalgamated with the Railways in order to get the advantages of unified control, through booking and simplified procedure in regard to handling and claims. With the adoption of the recommendation made in Chapter VIII., Part II., that the control of the wharves at Dar-es-Salaam should be placed under the Railways, the latter would then be in entire charge of goods from the time they reached the wharf at Dar-es-Salaam till they were handed over to the consignee at the Lake port.

298. The extent to which the Uganda and Tanganyika Railways can push their influence westwards and induce the traffic from Central Africa to pass by their routes, opens up the question of gauges. Owing to a misunderstanding, or rather through lack of proper ‘liaison,’ the Uganda Railway was built with a metre gauge, whilst the 3 ft. 6 in. gauge was adopted for the Soudan Railways. The Germans followed the example of the Uganda Railways and adopted the metre gauge. The British Railways in South Africa, South-West Africa, Rhodesia, Nyasaland and West Africa, and the Portuguese East African Railways are 3 ft. 6 in., whilst the French Railways in West and Equatorial Africa are metre gauge. The Belgians in the Congo do not appear to have adopted any definite policy; whilst
the continuation of the Broken Hill line from the south up to Bukama is on the 3 ft. 6 in. gauge, the Kongola-Kindu and Ponthierville-Stanleyville Railways are metre gauge. However deplorable the initial mistake may have been of not building all British Railways in Africa to the same gauge, any idea at the present time of changing the gauge of the East African Railways is entirely outside the realm of practical politics. While there remains so much country to be developed by the construction of new lines and there is so little money available to do it with, it would be quite out of the question to spend millions of pounds on a scheme which would bring practically no increase in revenue.

Any proposal to spend money on such a proposition at present would quite rightly meet with the strongest opposition. But as new railways are built in East Africa and the metre gauge system is extended, the cost of replacing it with 3 ft. 6 in. gauge becomes more and more prohibitive, and therefore, whether we like it or not, whether it may or may not be desirable from the strategical or Imperial point of view, commercial considerations will force the East African Railways to remain metre gauge. The objection, no doubt, will be raised that owing to the difficulty of working with mixed gauges Australia is contemplating converting the whole of her railways to one uniform gauge at enormous expense, and that the majority of Sir William Acworth’s Committee recommended that the question of the mixed gauges in India should be reviewed by a Special Commission, but the cases are not parallel. Transhipment for passengers and their luggage presents little difficulty; the main objections to it are the extra cost in handling goods traffic, and the trade either with South Africa or with the Soudan, which will pass by land route, will probably remain for more years than I care to contemplate in this Report at a level which can be easily dealt with by transhipment. But, whether this assumption is correct or not, practical considerations of cost will prevent any change in the East African gauge for many years to come.

As the East African route will be the shortest and best for the Northern Congo, it will be to the advantage of the Belgians that there should be a uniform gauge through from the Point of production to the sea. If the Belgians adopt the 3 ft. 6 in. gauge in the north of the Congo, the obstacle of the transhipment will force on to the Western or North-Eastern routes much of the traffic which would otherwise be able to use the Eastern route at lower cost. It is therefore to the interests of both parties that the metre gauge should be adopted for any railways built in the Northern Congo.

It will be argued that such a policy is directly opposed to the idea of establishing a British railway system on a uniform gauge stretching from the north of Africa to the south, but whatever may be the strategical and sentimental value of that idea, it is to the commercial and material interests of these colonies that as much traffic as possible from their neighbours should pass over their railways
and ports, and their commercial prosperity will form a surer source of strength in the future than the construction of strategic railways.

299. Before closing this review of future development, reference must be made to the trial which the Uganda Government is making of the Stronach-Dutton rail tractor system. The trial is fortunately on a sufficiently large scale to allow a judgment to be formed on the commercial and financial aspects of the system. For this reason it is important that accurate accounts should be kept with full details of expenditure, including renewals and loan charges. The experiment is of great importance, not only to Uganda, but also to Kenya and Tanganyika, because, if it prove commercially successful, it will provide the solution of the problem of light feeder lines to the main railway system, a problem which up to date has never been adequately solved, and will enable fresh areas to be opened up at relatively small expense.

Report
ON THE
RAILWAY SYSTEM
OF
TANGANYIKA TERRITORY
BY
BRIGADIER-GENERAL F. D. HAMMOND. C.B.E., D.S.O. /

[...] 
10th March, 1930. 
[...]

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1. The Railway System of Tanganyika Territory consists of a metre gauge railway from Dar-es-Salaam to Kigoma on Lake Tanganyika with a branch from Tabora to Mwanza on Victoria Nyanza, and of another metre gauge railway in the North of the Territory from Tanga to Arusha. There is also a small 2-ft. 6-in. gauge railway running from Tengeni on the Tanga line to Sigi to serve the Institute at Amani, and in the South of the Territory there is a small 2-ft. gauge tramway running inland 78 miles from Lindi.

The total route mileage of the Railways is 1,281 miles of metre, 15 miles of 2-ft. 6-in., and 78 miles of 2 ft. gauge, made up as follows:-

**Metre Gauge.**

<table>
<thead>
<tr>
<th>Route Miles</th>
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</thead>
<tbody>
<tr>
<td>Dar-es-Salaam to Kigoma</td>
</tr>
<tr>
<td>Tabora to Mwanza</td>
</tr>
<tr>
<td>Tanga to Arusha</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

**2-ft. 6-in. Gauge.**

<table>
<thead>
<tr>
<th>Route Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sigi line</td>
</tr>
</tbody>
</table>

**2-ft. Gauge.**

<table>
<thead>
<tr>
<th>Route Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lindi Tramway</td>
</tr>
<tr>
<td>Total Route Mileage</td>
</tr>
</tbody>
</table>

2. In addition to the Railways, other services, usually referred to as the Allied Services, are grouped under the Railway Administration. These consist of the Marine Department, the Dockyard and Slipway, the Harbour and Wharves, the Harbour Extension Works, and the Electricity Department. The work of the Electricity Department is not reviewed in this Report.

[...]

3. The Central line from Dar-es-Salaam to Kigoma is built to a high standard of construction; 662 miles out of 773 being laid with German permanent way with a rail weighing 56 lbs. to the yard and the remaining 111 miles with British standard 55 lb. material. The line is ballasted with stone to a depth of approximately 10 inches for 95 per cent. of its length. The maximum gradient is
2 per cent. compensated against exports and 2-2 per cent. compensated against imports.

The first 100 miles of the Mwanza branch are laid with the lighter German 42 lb. material released from that portion of the Central line which was relaid with 55 lb. British permanent way. The remainder consists of new 45 lb. British standard track. Only a portion of this branch is ballasted with stone. The maximum gradients are 1 per cent. against exports in the direction of Dar-es-Salaam and 1-25 per cent. against imports.

4. Under the Convention of March 16th, 1921, the Belgian Government has leased sites in the ports of Dar-es-Salaam and Kigoma, through which goods in transit to and from the Congo can be handled free of customs dues.

This transit traffic with the Congo is now the most important and most valuable traffic on the Central line. In addition to this there is a considerable export of cotton and sisal from the whole area between Kilosa, mile 177, and Dar-es-Salaam, and of ground-nuts from the stations round Manyoni and Dodoma and from the Mwanza branch.

5. On the Tanga line the original German construction was by no means up to the same high standard as on the Central line. The light German 31 lb. permanent way has, however, now been replaced by British standard 45 lb. material, the remainder of the line being laid with German 40 lb. track. About 95 per cent. of this line is also ballasted with stone to a depth of approximately 10 inches.

Formerly the line only went as far as Moshi, mile 220, with a branch 21 miles long from the Rau River to Sanya. An extension of 53 miles has just been opened from Moshi to Arusha which passes through Sanya, and the short Sanya branch has therefore been pulled up, except for a small section which will serve as a siding to an important sisal plantation. The new line is of 45 lb. British standard permanent way material. At Kahe, mile 208, there is a junction with the Voikahé line which is worked and administered by the Kenya & Uganda Railways.

The maximum gradient on the first section of the Tanga line up to Korogwe, mile 53, is 3-33 per cent. compensated in both directions; from thence to Arusha it is 2 per cent. compensated in both directions.

6. By far the most important traffic on the Tanga line is sisal and sisal tow which, in the year 1928/29, amounted to 16,977 tons, or over two-thirds of the total export tonnage. Although the greater part of this traffic comes from the coastal area, there are large plantations further inland and considerable development is taking place. Coffee is also an important traffic which showed a good increase during the past year; it comes mainly from the Moshi and Arusha area.

7. The headquarters of the Administration are at Dar-es-Salaam, all the principal officers being stationed there. The Tanga line is administered by district officials reporting to the heads of their respective departments at Dar-es-Salaam.
The accounts of the Tanga line are, however, kept distinct, and it is debited with its share of the management and supervision costs as well as with its appropriate loan charges.

The accounts of the Railways, including therein the Allied Services, are in theory kept separate from those of the Territory, the estimates of annual revenue and expenditure and of capital expenditure being presented in a separate volume, but the separation is not complete as some of the assets of the Railways figure also in the assets of the Territory.

8. The Central line was formerly the property of a German Company. In January, 1925, the High Court of Tanganyika Territory assessed the valuation of this line at £614,000. Against this the Tanganyika Government received £580,006 in respect of the interest of the German Government in the Company. The net amount therefore paid for the acquisition of the Central line was £33,994.

As the Tanga line was owned entirely by the German Government, nothing had to be paid to acquire it.

9. Until the financial year 1925/26 the accounts of the two lines had always shown an excess of expenditure over receipts; in that year not only was there a surplus on revenue account, but the net loss after allowing interest on loans only amounted to just over £3,000. In the last financial year 1928/29, there was a surplus on the working of the whole undertaking, including the Allied Services, after paying interest on loans of £122,692. No allowance was, however, made in this for depreciation. The improvement is mainly due to the Central line, which showed a surplus of £140,280 after allowance for interest had been made. On the other hand the Tanga line still showed a loss on revenue account alone before allowing for loan charges.

This is in marked contrast with the situation as it appeared when I reported on these Railways in 1921. Then, although both lines were working at a loss, the prospects of the Tanga line were, according to the opinions of all whom I consulted, considered by far the brighter both on account of the possibilities of the Moshi-Arusha area and because development had already begun along the lower section before the War. The change in the relative positions is well shown in the coaching and goods earnings of the two lines. In the year 1922 these totalled £196 per mile for the Central line and £162 per mile for the Tanga line; in the year 1928/29 they were £583 and £321 per mile respectively. The growth in the former has been due principally to the development of the transit trade with the Congo, and in a lesser degree to the good agricultural development in the area between Kilosa and Kidugallo.

Although overshadowed by the results on the Central line, there has also been excellent development on the Tanga line, but the retention of two outlets for the Moshi and Arusha traffic has meant a division of the receipts coupled with expenditure in operating and maintaining two lines instead of one, while
the upper section of the Tanga line, apart from Moshi itself, has produced up to date insignificant receipts.

10. Although the financial results have thus shown a welcome improvement, the traffic on both lines still remains light. On the Dodoma – Morogoro section the average number of trains per week is fourteen each way, on the Morogoro – Tabora section nine to ten, and on the Tabora – Kigoma and Tabora – Mwanza section four per week each way. On the Tanga line there is an average of fifteen trains a week each way as far as Korogwe; beyond that the average does not exceed six a week each way.

Organisation.

11. The traffic working of these Railways is organised on what is usually called the 'departmental' system. The Traffic Department under the Traffic Manager is in charge of the movement of trains and vehicles and supervises the guards, conductors and station staff, but the Chief Mechanical Engineer is responsible for the supply of motive power and the maintenance of locomotives and rolling stock as well as for the supervision of drivers, firemen and running shed staff. The Traffic Department is also in charge of the commercial side of traffic organisation which includes all dealings with the public, both in regard to coaching and goods, and the booking, consigning and delivery of freight. It also controls the traffic side of the working of the S.S. ‘Liemba’ on Lake Tanganyika; that is to say, it fixes the timetable and is in charge of the receipt, consignment and delivery of goods, of passenger work, and of all rates and fares questions.

CHAPTER II. – ENGINEERING DEPARTMENT.

12. The Engineering Department of the Tanganyika Railways is in charge both of maintenance and of new construction, survey and capital works.

The maintenance includes the upkeep of harbours, wharves and lighthouses as well as the usual maintenance work of a railway.

In 1929/30 the most important capital works were the construction of the extension to Arusha and the relaying of the coastal section of the Tanga line with 45 lb. British standard track. Both were nearing completion at the time of my visit.

The only survey in hand was a further investigation of one section of the proposed Engare Nairobi branch.

As money has been allocated for the Iramba Plateau Railway and application has been made for assistance from the Colonial Development Fund for the construction and survey of other branch lines, as well as for a capital works building programme, it is anticipated that there will be considerable capital works in progress during the next two or three years, and allowance for the expansion required for this must be made in the general organisation of the department.
13. The ordinary maintenance on the Central line was previously organised in two districts; the first with headquarters at Dodoma and in charge from Dar-es-Salaam to Tabora (both exclusive), amounting to 522 miles, and the second with headquarters at Tabora and in charge of the remainder of the Central line, including the Mwanza branch, making in all 487 miles. The Chief Engineer was of the opinion that these districts were too long for adequate supervision, more especially in view of the fact that the Mwanza branch was new and was only fully ballasted for a short distance and that a certain amount of building work was still in progress. A reorganisation into three districts was therefore approved and the staff for it sanctioned in the year 1929/30. It had not come into operation at the time of my visit. Under the new organisation the three districts would be as follows:–

<table>
<thead>
<tr>
<th>Headquarters</th>
<th>Route Mileage</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Dar-es-Salaam – Itigi (exclusive)</td>
<td>Dodoma. 385</td>
</tr>
<tr>
<td>(2) Itigi – Kigoma</td>
<td>Tabora. 388</td>
</tr>
<tr>
<td>(3) Tabora (exclusive) – Mwanza</td>
<td>Shinyanga. 236</td>
</tr>
</tbody>
</table>

Dar-es-Salaam itself is in charge of an Assistant Engineer reporting direct to the Chief Engineer. There is a good deal of work at Dar-es-Salaam itself and, if it was included in a district, the headquarters would have to be moved there, which would tie down the District Engineer and make it less easy for him to supervise the remainder of his district. The arrangement appears to be working satisfactorily and in the circumstances I recommend its retention.

Also, I consider that the division into three as opposed to two districts is justified; it has the disadvantage that the district officers of the department are not quartered at the same place as the district officers of the other operating departments, but the train service is so infrequent that it is undoubtedly difficult for a District Engineer to control 500 miles properly, particularly as the new branch requires a good deal of attention. / An Assistant Engineer is allowed at the headquarters of each district.

The Tanga line, including the Arusha extension, forms a single district on the same basis as the others. Its route mileage is 272 or, including the small Sigi line, 287.

14. The subordinate superintendence of works is carried out by European Inspectors of Works in each district, one being allocated to the Assistant Engineer at Dar-es-Salaam. For permanent way the subordinate superintendence consists of Permanent Way Inspectors, some of whom are European and the remainder Indians. Each Permanent Way Inspector is in charge of roughly 75 miles and he has under him two or three Sub. Permanent Way Inspectors, either Asiatic or African. The Sub. Permanent Way Inspectors are usually in charge of five gangs consisting of 12 men, including the headman, the average length detailed to the gang being about five miles. The Permanent Way Inspector is expected to cover
his section about four times a month while the Sub. Permanent Way Inspectors
Can usually cover their sections twice a week, thus seeing each gang four times a
week. This system is adapted from that used on the Indian Railways and appears
to suit the local conditions.

15. But, while I have no fault to find with the organisation, I consider the
numbers employed on track work are excessive, particularly on the Central line.
The average number of headmen, labourers and trolley boys during 1928/29
On the Central line the figures were respectively 2.30 and 2.17 per mile. These
are average figures for the year. On the Central line in March, 1929, 3-26 were
employed per mile. Also all sidings and yards have been included at their full
mileage; usually their mileage is included at one-third of its full length.

The Central line is constructed to a higher standard, particularly in respect
of ballast, than any railway in tropical Africa. The traffic is very light, averaging
in the most crowded section only two trains a day each way; the organisation
admits of ample supervision and the highest speed allowed is 25 miles per hour.
In view of these advantages, the Engineering Department should have little dif-
culty in maintaining a good track with two men a mile as a maximum.

On the Tanganyika line, where the standard of construction is lower, the average
number employed per mile is less, and this is in itself a condemnation of the
Central line, but even here I think it should be possible to effect a reduction to
the same figure of two men a mile.

16. During the War many of the bridges were damaged and were subse-
sequently repaired. All of these have now been replaced, with the exception of
about seven which are still in use. The most serious case, the bridge over the
Pangani at Korogwe, is being replaced during the current year and an item of
£4,000 is included in next year’s estimates for the renewal of others. I agree with
the necessity for this expenditure. A proper register of bridges is maintained.

17. Most of the station buildings, workshops, running sheds, goods sheds
and European quarters are of a permanent character; practically all the unskilled
African staff are housed in temporary huts. These are expensive to maintain as
the men have to be allowed so much time off / in order to build and repair them.
The majority of the Asiatic employees are also drawing housing allowances, and
not only is this costly, but the accommodation available for them is unsatisfac-
tory. A three years’ programme has therefore been established in order to build
Asiatic and African quarters. The total building programme will cost £153,000,
of which in the first year £36,000 will be for permanent quarters for Asiatics and
£18,000 for Africans. I think the expenditure is judicious and will be compens-
ated by the saving in house allowance and in the extra work obtained from the
African staff as well as by increased efficiency. I therefore recommend the alloca-
tion of the funds asked for.
No register of buildings has yet been made and I think it would be advisable to start one as soon as possible, as without a complete register, maintained up to date, confusion and disputes are bound to arise.

18. The control of expenditure appears good and prompt. When the Annual Estimates are finally approved, the Chief Engineer makes a definite allotment to districts, keeping in the case of certain sub-heads a reserve in his own hands in case of contingencies. The District Engineer knows within two or three days of the end of the month his expenditure for that month. The expenditure statements are then forwarded in original to the Chief Engineer, who thus knows by the 8th usually, and never later than the 10th of the month, the expenditure on the Central line. The statement from the Tanga line may be later but this is due to difficulties of communication. I also satisfied myself that the system of monthly progress reports and completion reports was satisfactory.

19. Delay, however, appears to occur in the case of individual works. The District Engineer prepares rough estimates of these when he includes them in his draft estimates for the coming year. If they are approved by the Chief Engineer and the General Manager, they are included in the Estimates for the year. When the Estimates have been finally approved by the Secretary of State, the Chief Engineer informs the District Engineer to that effect and allocates the money. Before work can begin, however, the District Engineer has to prepare and forward to the Chief Engineer a detailed estimate for each specific work, and these have in turn to receive the Chief Engineer’s approval. All this takes time, especially in the case of an isolated district like Tanga, and so a good deal of the financial year has slipped by before work can be started, with the usual result that there is a rush at the end of the financial year to get these works finished. It seems to me that time could be saved if the District Engineers were instructed to prepare detailed estimates for these specific works as soon as the Railway Estimates have passed the Legislative Council. In the case of very large works such as relaying, full estimates will have to be prepared before the work is put forward, and, in the case of the ordinary works items, it is seldom that these are struck out by the Secretary of State, so that there is little danger of time being wasted on detailed estimates which will not be required.

20. The last schedule of prices, which was prepared in 1925, is now out of date. The Chief Engineer says that it is not possible to fix a schedule as the rates of labour fluctuate and the prices of materials are not yet stabilised. As regards the latter point, the prices of materials have not varied so much during the past few years as to disturb a schedule of prices very much; other African railways have managed to keep them with little difficulty. Fluctuations in labour costs have, however, undoubtedly a particular importance in Tanganyika Territory, as rates of labour vary materially not only as between one district and another, but with the seasons. It is a difficulty, however, which I think is surmountable.
The District Engineers have a good deal of estimating to do and each usually keeps his own individual list of costs in order to prepare his estimates. It may or may not be handed over to his successor, or it may be compiled in such a form as to be of little use to the latter, who then has to compile his own list or search through old estimates for appropriate prices. It is therefore in the interests of the District Engineers themselves and of sound estimating that I recommend the compilation of a proper schedule of prices. To allow for fluctuations in labour costs the rates of pay assumed can be quoted so that suitable allowance can be made, or, if such large fluctuations occur between districts as to render this of no use, district schedules should be maintained. The Chief Engineer should lay down the form of the schedules and the information and items to be given in them, and they should be included in the official documents to be handed over by the District Engineer to the officer taking over from him.

21. [...]  

22. The majority of the building work in Dar-es-Salaam has been carried out by contract with satisfactory results and most of the ballast is bought in the same way. In this respect these Railways are fortunate as it is rare on Colonial railways to be able to use contract work to this extent. In Tanga, while it is possible to do the larger works satisfactorily by contract, it has been found better to carry out the smaller works departmentally.

23. The two lines which have been constructed since the present Administration took over charge, the first from Tabora to Mwanza, 237 miles, and the second from Moshi to Arusha, 53 miles, have both been built by local firms under contract. The question has arisen as to whether this method should be adopted for the construction of the new branch railways or whether these should be built departmentally.

In considering the question it must be remembered that on the Tanganyika Railways there is at present no Construction Branch and that it is precisely in the building up of such an organisation that the greatest liability to waste occurs. The whole of the staff has to be engaged specially for the work; of the competence of the individuals or of their suitability for the work and the country there is at the time of engagement usually only a superficial knowledge. They are, however, responsible for much larger expenditure proportionately than the maintenance engineers, and, consequently, before those amongst them who are incompetent can be weeded out, they can and may waste considerable sums of money. The loss entailed in their pay and passages is trifling compared to the sums they can waste through bad work which has to be done over again or through lack of proper supervision. This danger is aggravated by the fact that it is more difficult to get rid of people in government as compared with private employ, especially when it is a question not so much of an individual act as of general incompetence to obtain proper value for money spent. The contractor is better placed than
the government; he is in the position of an established institution with expert knowledge of this particular class of work; he is probably already in touch with all the engineers he will require, except those who are quite junior; he has in all likelihood employed most of them before and is usually in the position to obtain accurate information about the remainder; and he can get rid of any of them at short notice. His system of pay is more elastic and he can give his engineers a financial incentive to carry out the work economically and quickly. Also, losses due to the incompetence of any individual engineer fall on the contractor and not on the government. For these reasons I am of opinion that, when the railway to be built is a straightforward construction job with no complications which are likely to lead to delays and claims and where reliable firms can be found who are prepared to submit tenders on a schedule of prices, it is more economical to employ contractors than to build up a special construction organisation.

The Chief Engineer recommends, however, that future construction should be carried out departmentally with the aid of small contractors. These small contractors would carry out the earthwork and other operations entailing mainly only unskilled labour. It must be remembered that this method was the one used on the construction of the Central line on which the Chief Engineer was employed and therefore is the form with which he is most familiar. Also, in the mind of any keen engineer there is an unconscious bias in favour of carrying out the construction himself. The main substance of the Chief Engineer’s argument is the elimination of the contractor’s profit but this, I think, is outweighed by the advantage which a contractor possesses enabling him to quote a cheaper rate for work than can be attained by a government department.

The General Manager, on the other hand, is by no means averse from letting the whole of one construction to one contracting firm, subject to the provisions which I have mentioned above.

In both cases these somewhat conflicting views have been formed after an experience of two branch lines both built by contract under the supervision of the two officers concerned. The situation is further complicated by the fact that the preparations for the construction of the Iramba Plateau Railway are, I understand, too far advanced to admit of tenders being asked for from British firms without an undue waste of time and consequently of money, thus limiting the possible tenders to local firms. At the same time, if, as I recommend later, a continuous programme of construction, stretching over some years, is introduced, the decision taken as to the method of constructing this railway will probably fix the methods adopted throughout the programme. It would be bad policy to go through the expensive work of building up a construction organisation and then disperse it in order to revert to contract.

The only solution which it is thus open for me to recommend is that tenders should be called for locally. If the General Manager is satisfied / that as a
result he can obtain a contract which is satisfactory both as regards price and as
regards the financial and engineering standard of the contractor, I recommend
that construction by contract should be adopted as the definite policy through-
out the whole programme and that, in future, sufficient time should be allowed
to enable British firms to tender in the ordinary way.

In the absence of a satisfactory tender for the Iramba Plateau line, the only
course will be to form a construction branch and use the departmental method
for the whole programme of new construction.

24. The present establishment of Engineers as allowed in the Estimates for
1930/31 consists of a Chief Engineer, a Senior District Engineer, 5 District and
10 Assistant Engineers. The Senior District Engineer in practice acts as deputy
for the Chief Engineer on the maintenance side. The Chief Engineer, being in
charge of construction and survey as well as maintenance, has necessarily had
to pass a good deal of time away from his headquarters. These duties are not
likely to decrease in the future and I therefore consider the retention of the post
of Senior District Engineer necessary. Allowing, in addition to the two senior
officers, one District Engineer and one Assistant Engineer for each of the four
districts, one Assistant Engineer for Dar-es-Salaam, and one Assistant Engineer
for harbour and lighthouse works, this gives a total of 12 Engineers required
permanently in the country on maintenance work. In addition, 2 Engineers are
required for capital works in view of the programme in hand, making a total of
14 posts.

Under the leave regulations an officer spends roughly 30 months in the
country for every 8 months spent on leave, including the time spent on the
passage to and fro; this means that the number of posts to be filled must be
increased by approximately one-quarter to permit of leave. The total establish-
ment of 17 Engineers is therefore not excessive. For construction and survey
work additional Engineers will have to be engaged according to the programme
undertaken and the method of construction adopted, and they will be paid out
of the funds allotted for those programmes.

25. It was proposed to me that an increase should be made in the salaries of
the Chief Engineer and the Senior District Engineer on the grounds that they
were not as high as those on the Kenya & Uganda Railways. The salary of the
former is at present £1,350 and of the latter £1,050, as against £1,750 in the case
of the Chief Engineer and £1,250 in the case of the Assistant Chief Engineer,
Kenya & Uganda Railways. I regret that I cannot admit either that the responsi-
bilities and work are equal or that the salaries in one colony must necessarily be
regulated by those of its neighbours. The Chief Engineer, as it is, draws £100 a
year more salary than the Chief Mechanical Engineer, the Traffic Manager or the
Chief Accountant. This differentiation is a relic of the days when the Engineer-
ing was considered the most important of the departments, and it often has the
disadvantage that the Chief Engineer merely by virtue of his larger pay acts for the General Manager in the latter’s absence, whether he is the best qualified or not. Where, however, as in this case the Chief Engineer has extra responsibilities in connection with the construction of new lines, I consider that he should receive extra remuneration, but this should take the form of a special construction allowance. I recommend, therefore, that future holders of the office should receive the same salary, £1,250, as the heads of the other three principal departments, and in addition a special construction allowance which should only be paid whilst new lines are actually under construction. / 

CHAPTER III. – LOCOMOTIVE DEPARTMENT.

26. The organisation of the Locomotive Department has been dictated by the fact that it possesses three separate workshops at Dar-es-Salaam, Tabora and Tanga. The German Administration had intended to establish the main workshops of the Central Railway at Tabora and abolish gradually those which already existed at Dar-es-Salaam. In pursuance of this policy they had already constructed and fitted up a workshop at Tabora, which, at the time of my previous Report, was the most modern and best equipped on the system.

The policy of the British Administration has been to install any new machinery and plant at Dar-es-Salaam and enlarge it as required for reasons connected with housing, labour and proximity to the port, but, though no expansion has been carried out at Tabora, the existing facilities have had to be used to their fullest capacity.

At Tanga, owing to the uncertainty connected with the future administration of that railway, the policy has been to spend as little on workshops as was compatible with keeping the current work going.

It has thus been necessary to organise the department in three districts, each with its own workshops. While this dispersion of shops is not economical, the Railway Administration had no other course open to it and I think the decisions to extend Dar-es-Salaam rather than Tabora and to spend as little capital on the shops at Tanga as possible were sound.

Each district is under a District Locomotive Superintendent who is in charge of both running and shops, with, in the case of the Dar-es-Salaam and Tabora Districts, an Assistant Locomotive Superintendent under him. In the Estimates for the year 1930/31 an Assistant Locomotive Superintendent has also been allowed for Tanga owing to the increase in the work there. The Assistant Locomotive Superintendents are occupied mainly with the workshops, while the District Officers attend rather to the general district work, including the running, but there is no hard and fast rule and Assistant Locomotive Superin-
tendents are expected to be prepared to take over charge of the district at any moment.

At headquarters one Assistant Locomotive Superintendent and one Technical Assistant are normally posted to the Chief Mechanical Engineer’s office.

This gives a total number of posts to be filled of 9, or, allowing for leave, 11. This staff, although not excessive, is, I consider, ample for the work.

27. The locomotive situation at the time of my inspection showed that 71 engines were on the books, 51 being on the Central and 20 on the Tanga line. Of the total, 27 were of post-war construction and the remaining 44 were either old German engines or obtained second-hand from overseas during the War. The bulk of the stock is thus either quite new or very old. Out of the 71 engines on the books, 9 were under repair and 2 awaiting repair; this gives a figure of 15 1/2 per cent. under or awaiting repairs. This figure would have been better, had it not been for the fact that there had been a heavy rush of traffic on the Tanga line in order to move the material for the construction of the Arusha extension. This had rather over-streained the capacity of the Locomotive Department and, when it was over, engines had to be brought in for general repairs before the normal time, with the result that two of them had been awaiting repairs for over six months. As 15 per cent. is the usual allowance for engines under repair, these results can be called satisfactory.

28. The average mileage run per engine in service per month for the first quarter of the financial year 1929/30 was 1,627. This figure is below the average which it is normally hoped to obtain, but it would be unfair to expect a normal figure because the traffic is sparse and several of the engines are employed on fuel trains which can only make a small mileage.

For the three heaviest classes of engines, the averages were respectively 2,922, 2,152, and 2,362 miles per month per engine, which can be considered quite good in the circumstances. These results are due to the institution of caboose working on the Dodoma – Tabora and Tabora – Kigoma sections. The locomotive is worked by a double set of enginemen, one crew resting in the caboose whilst the other is on duty. By this means the engines on the Dodoma – Tabora section do a run of 478 miles in about 32 to 38 hours, according to the class of train. It has not so far been found possible owing to a variety of causes, such as variations in loads and unsuitability to traffic requirements, to institute caboose working with advantage on the other sections of the Central line nor on the Tanga line. But, though not for the moment practicable, I think the possibility of extending this method of working to other sections should always be kept in view, as it forms one of the best means of getting the most value out of the heavy capital sunk in the engines.

29. The fuel used is wood except on the Dar-es-Salaam – Morogoro and Tanga – Buiko sections, where wood has become scarce and expensive. The Gen-
eral Manager informed me that after investigation of all the factors involved in using wood, such as the running of fuel trains and labour, it has been decided that it becomes cheaper to burn coal when the cost of wood reaches 11s. 30c. per 100 c. ft. That stage has already been reached on the two sections named. The fuel consumption appears to be watched carefully. The average consumption of wood fuel in 1928/29 on the whole system was 4.64 c. ft. per engine mile. It is difficult to get a standard of comparison as so much depends on the quality of the wood. The coal consumption on the Central line was, during the same year, 64 lbs., and on the Tanga line 58.4 lbs. per mile. The former of these figures is, as the Chief Mechanical Engineer agrees, distinctly high; he attributes it to the native firemen not being well acquainted with the use of coal. I consider that it should be possible to improve both figures.

30. The figures for the consumption of lubricating oil are 6.59 pints per 100 miles on the Central line and 6.32 pints per 100 miles on the Tanga line. These results are satisfactory.

31. In the number of engine failures the figures are by no means so satisfactory. For the past four years they are as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Engine miles per failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1926/27</td>
<td>24</td>
<td>46,694</td>
</tr>
<tr>
<td>1927/28</td>
<td>32</td>
<td>33,540</td>
</tr>
<tr>
<td>1928/29</td>
<td>55</td>
<td>23,451</td>
</tr>
<tr>
<td>1929/30</td>
<td>21</td>
<td>27,308</td>
</tr>
</tbody>
</table>

In presenting these figures to me the Chief Mechanical Engineer called my attention to the increase during the past two or three years and said that it was the subject of considerable concern, especially the fact that such a large proportion proved on investigation to be due to neglect by staff. This was found to be the cause in 33 out of the 55 cases which occurred in 1928/29, and in 7 out of the 21 cases in the first six months of 1929/30. The majority of these cases took place with African drivers. Special inspection measures were being taken to cope with the trouble, but the main cause in the Chief Mechanical Engineer’s view was the difficult stage which the education of the African has reached. I propose to discuss this question generally for all departments in a later chapter and it is therefore only necessary here to say that the experience of the Locomotive Department has been that, after the native has received a certain measure of training, he appears to slacken off, either from lack of ambition or from conceit that he has already learned all that he need, and neither fines nor dismissal appear to act as an efficient deterrent. A certain measure of discontent is also due to the rates of pay for Africans being lower than those received by the Asiatics and
to the fact that, whereas all Asiatic drivers receive mileage allowance, no Africans do. The reason for this difference is that no African driver has yet reached the standard of the worst paid Asiatic. They can consequently only be used on trains which run intermittently and, if they were placed on mileage allowance, the total amount they received would vary violently from month to month with the traffic. This would probably give rise to more discontent than the present arrangement. The experience is a disheartening one, but the Chief Mechanical Engineer has very rightly not been deterred thereby from pursuing the policy of training the African until a higher standard has been reached, which is the only real and final solution of the difficulty. Meanwhile it is sufficient to note that the Department is alive to the state of affairs and that apparently, as a result of the measures taken, there has been a slight improvement during the past six months.

32. Before leaving the question of the training of the African as an engine driver, I wish to point out one direction in which I think an improvement is possible. At present there are European, Asiatic and African drivers. There can be no question yet of dispensing with European drivers; they are necessary not only for the more important duties but also for educational purposes. In fact, owing to the disappointing results with African drivers, it has been necessary to increase the numbers of both European and Asiatic drivers in the Budget for the coming year in order to be ready for the increase in traffic which is expected.

At present none of the African drivers and only a few of the Asiatics can read or write English. The system of passing traffic is by line clear orders transmitted by the telephone and conveyed to the driver and guard by a message written in English authorising them to proceed with their train to the next station. When a driver cannot read, this has to be read out to him by the station-master, the man who has written out the order and has been responsible in part for its transmission. The driver is thus at the mercy of the station-master and, when he arrives at the running-shed and has to return his ticket for the run, he is equally at the mercy of the shed clerk as well as of any fuel clerk whose receipt he has to sign for fuel put on his tender.

At present recruits for African engine drivers are drawn solely from the unskilled workmen who have been employed as cleaners or in the running shed and have been promoted thence to firemen. This is the class in which it is rarest to find any education. Nor is it only in regard to making out and checking returns that education is required for an engine driver. It is one of the most difficult and, beyond dispute, one of the most responsible of the trades on a railway. It is difficult to expect good results so long as the recruits are drawn solely from the worst educated class; it is merely a reflex of the ordinary English system, but in England the cleaner, who is the ordinary recruit, is far better educated nowadays than the best African driver. On the other hand, it will be impossible to get
the better educated native to undertake the manual labour of firing unless it is merely a comparatively short stage in the process of becoming a driver.

I therefore suggest that, just as in the case of the workshop artisans, a regular class of apprentice driver should be formed. They would have to do a certain amount of firing and shed work in the course of their apprenticeship but it should always be kept in view that the object of their apprenticeship is to turn them into drivers and not firemen, and they should be trained with that object and made to attend technical classes like other apprentices. It would probably be better for this reason to concentrate them into one or at the most two classes, one on the Central and one on the Tanga line. At the same time it would be advisable in order to keep both avenues of recruitment open not to draw the whole of the drivers from this source, but to give a few of the annual vacancies to such firemen as pass the approved test. This system has been adopted in Nigeria as the result of the recommendations of the Report which I made in 1924, and an interesting account of the methods adopted is contained in the Annual Report of those Railways for 1929/30.

33. One of the most serious disadvantages with which the Locomotive Department has to cope is the scarcity of water and its bad quality. Owing to the failure during the dry season of several watering stations, improvised tank trucks have to be used over long runs, an expensive arrangement as it means cutting down the paying load. At several points, also, such water as can be obtained is bad; as the source gets low, the water becomes charged with vegetable matter and mud. Though salt is also sometimes present, the water is on the whole fortunately free from acids. The other impurities, however, entail the necessity of special precautions as regards washing out boilers. A special drill has now been obtained in order to try and tap the more deeply seated water and to free the railway from being so dependent on the ordinary surface supplies. A further sum of £10,000 has also been allocated from Loan funds for expenditure on water supply in 1930/31 and an additional £10,000 is included in the probable capital expenditure of the year after. In my opinion these expenditures are thoroughly justified and I consider the work of drilling in order to find a more permanent supply at a lower level should be pushed forward as rapidly as possible.

34. The vehicle situation at the time of my inspection showed that out of a total of 86 passenger vehicles on the books of the whole system, 12, or just under 14 per cent., were under repair and none were awaiting repair. Out of a total of 1,098 goods vehicles, 35 were under repair and none were awaiting repair, a figure of just over 3 per cent. The former figure is on the high side due to the practice of withdrawing passenger vehicles from service every four to six months in order to revarnish them with one coat; this method is found to economise as against repainting which would have to be carried out very frequently in a climate like Tanganyika. The figure for goods vehicles is distinctly good. /
35. The maintenance of vehicles in general is to a good standard and it has been found possible to lengthen the time between the periodical examinations. Passenger stock is only lifted once every year and the axle boxes are repacked every three months. Goods stock is lifted only once in every two years and the boxes repacked every six months. That this economy has not been attended with any evil results is shown by the figures for hot axle boxes, as shown in the following table:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Hot Axle Boxes</th>
<th>Number of Vehicle Miles run per Hot Axle Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>1926/27</td>
<td>160</td>
<td>79,561</td>
</tr>
<tr>
<td>1927/28</td>
<td>156</td>
<td>88,216</td>
</tr>
<tr>
<td>1928/29</td>
<td>80</td>
<td>209,756</td>
</tr>
</tbody>
</table>

36. The number of vehicle miles run per pint of axle oil consumed is 680. While I have no complaint to make as regards this particular figure, no regular records of this consumption are kept. The figure quoted above had to be obtained specially for me. I think that this consumption figure should be recorded and watched every month as is done with the figure for the consumption of oil on locomotives.

37. While expenditure and consumption are carefully watched, the system depends mainly upon personal inspection and supervision. The statistics as to the work done and money and stores spent do not reach the Chief Mechanical Engineer’s Office until a long time after the period to which they relate. Thus statistics showing the individual performance of each engine are prepared monthly in considerable detail as regards mileage performed and stores spent, but they are not received in the Chief Mechanical Engineer’s Office until five weeks after the end of the month. He must rely on the personal inspection of his officers to see that waste does not occur; he cannot stop it until it has been in progress for some time. It is fair to say that I saw no indication of undue extravagance, but control through the personal inspection of the senior officers is only possible so long as there is only a small amount of traffic passing. In all business undertakings, once the volume of business has reached any considerable dimensions, the senior officers cannot hope to control solely by personal inspection; they must do so through statistics giving the work done and the cost of doing it either in cash or in stores. And the first essential of these statistics is that they should be live and place the principal officers in possession of the important figures at once so that action can be taken on them without delay. It is significant, too, that the statistics given to me by the Locomotive Department at Tanga were more up to date and complete than those on the Central line.

As I found that the statistics used by the Traffic Department were similarly out of date by the time they reached the Traffic Manager and also that the two departments were in certain cases both preparing the same statistics, I arranged
with the General Manager for the formation of a Statistics Section in the Accounts Department, which would supply to each department the operating statistics which it required. The statistics to be prepared and the dates by which they are to be supplied to the Heads of the Departments are given in the Chapter relating to the Traffic Department. / 

38. Very complete boiler registers are maintained in the Chief Mechanical Engineer’s Office, but practically no records of the engines themselves. I consider that proper engine registers should be started giving the full particulars of each engine as placed in traffic, the mileage worked each month, the date of general or intermediate repairs, any alterations or matter calling for particular notice, and all accidents. In this way a valuable record is kept of the performance of individual engines or types, which is available for reference at any moment.

39. In contrast to the poor engine records, an elaborate card index is kept for the whole of the axles on the line, each axle being numbered. The Chief Mechanical Engineer explained that his reason for establishing this was to watch the total mileage done by each axle and guard against any of them failing from fatigue of material due to excessive mileage. But, long before the axle would fail from this cause, there would normally have been such wear on its journal as to bring that below the scrapping dimensions. It is, in short, a very elaborate safeguard against a contingency which is remote in the extreme, far more remote than many of the contingencies which this and every other Colonial railway has to face every day in the course of normal operation. I know of no other railway which maintains a record for this purpose. I recommend that it should be discontinued and that the two clerks employed on its compilation should be transferred to the Statistics Section which I am recommending should be formed under the Accounts Department.

40. The shops at Dar-es-Salaam have recently been enlarged and a new erecting shed has been added, thus improving not only the facilities for erection but allowing the machine shop also to be made larger. The large stationary jacks installed by the Germans for lifting engines have been taken out and a travelling crane substituted.

Tabora shops have been maintained at approximately the same level of output as when taken over.

At Tanga a few machine tools have been added but otherwise no improvements or additions have been made; the consequence is that with the growth in traffic the shops are now very crowded and have great difficulty in coping with the work. This is accentuated by the fact that this is the only mechanical engineering shop in the North of the Territory and it is frequently called on to execute urgent repairs to machinery, such as that in a sisal factory, work which, in the interests of the Railways themselves, cannot very well be refused. With this policy of spending no capital on the Tanga shops until the future of the line
has been settled I am in entire agreement. If it is to be worked in the future by the Kenya & Uganda Railways, these shops will at once lose their importance and, even if they are maintained, will not be called on to do the same amount of work as in the past. Any capital spent on them would then be wasted.

In the Dar-es-Salaam shops there are five pits; of these one is required for light repairs and one for tenders, leaving three pits available for general overhauls and erections.

The average time taken in the Dar-es-Salaam shops for a general repair to an engine in the past financial year was 3 1/2 months. With the new facilities the Chief Mechanical Engineer hopes to reduce this time to 70 working days, or slightly less than the three months which is usually allowed. Assuming a maximum of twelve engines to be erected a year and each taking a fortnight to erect, the pits will be occupied for 144 working days on this work, leaving the capacity of the shops for general repairs at 10, or perhaps at a pinch 11 per year.

At Tabora the Chief Mechanical Engineer hopes to reduce the time of a general overhaul to three months; allocating one out of the three pits there for light repairs leaves a total of 8 general overhauls a year, or a total for the whole Central line of 18 to 19 general repairs a year.

The system of repairs adopted is to give a light intermediate repair between the general overhauls; the boxes are then done, wheels are replaced or re-turned, and the motion, if in bad condition, receives attention. This repair only takes a few days. The general overhaul is then not undertaken until the locomotive has run 90,000 to 100,000 miles. This is much in excess of the usual mileage which a locomotive is allowed to run on railways of this character before it is shopped. The Chief Mechanical Engineer assures me that as a result of their experience they have found that the engines on this railway, provided they receive the light intermediate repair, do not require a general repair earlier and are in quite a good state when they return after doing 100,000 miles. I saw no reason to dispute this; although there has been an increase in engine failures, investigation shows that these are mainly due to neglect by staff and only a normal proportion to mechanical defects. This exceptionally advantageous situation the Chief Mechanical Engineer attributes mainly to the very heavy standard of construction of the main line.

As against the figure quoted above of 18 to 19 general repairs per year as the capacity of the shops on the Central line, there are at present on the books 52 locomotives. The shops can therefore give a general repair to every locomotive on the Central line every three years with a small margin in hand. The average mileage for all engines has not yet reached 20,000 a year and the maximum mileage per engine is about 35,000; so that in the three years between general repairs the mileage run by engines will not exceed the normal figure and will fall well below the Chief Mechanical Engineer’s figure of 90,000 to 100,000. There is a
further margin in that, if necessary, work on tenders could be removed to the wagon shop and another pit freed for general repairs or erection.

The newly approved Iramba Plateau Railway will not necessitate the purchase of more than three or four new locomotives, so that on this basis the shops, as recently enlarged, can be said to be adequate for the needs of the Central line for several years to come.

41. The situation on the Tanga line is naturally not so good; there are only two pits and, allowing for light repairs and erections, the Chief Mechanical Engineer estimates that only five general repairs can be effected a year. As against this there are 20 engines, so that on the present basis an engine can receive a general overhaul once in four years. I do not, however, recommend any increase in these shops pending the settlement of the final policy to be adopted as regards this line. If it is decided that it is to be run in the future by the Tanganyika Railways, large expenditure will have to be incurred in enlarging and improving them throughout. / 

42. While the work turned out from the shops appears to give no reason for complaint and there does not appear to be any waste of funds, the whole organisation of the three workshops depends solely, as in the case of running, on the personal supervision of the individuals in charge. The Chief Mechanical Engineer knows the expenditure incurred in each shop under each sub-head by the 15th of the month following. Special work or work for other departments or the public is costed, but apart from this not only is there no attempt at ascertaining the cost of any work done but even the ordinary system of work orders is not used. Time and materials for any job are allocated direct to the sub-head in the Estimates, for example, that for Stores for Maintenance of Engines and Rolling Stock, without distinction as to what engine they are for or even whether they are for engines or wagons, and the allocation is in many cases made by the foreman in charge.

The Chief Mechanical Engineer’s defence is that each individual workshop is so small that the officers can ensure by personal supervision that no waste is taking place. Undoubtedly in a small shop waste can be eliminated by careful and constant supervision, but the Tanganyika Railways’ shops, and more particularly the Dar-es-Salaam one, are growing beyond the stage when it is possible for one or even two men to guarantee by personal inspection that due economy is being observed. Moreover, even in small shops if the man in charge has no figures to judge by he can only trust that his supervision is achieving its ends; he has no proof in the shape of figures to show that the cost of doing a certain operation is not increasing, nor that one method of carrying out a work is cheaper than another. The absence of work orders also means that there is no certainty that the expenditure is being allocated correctly, especially when it is in the hands of foremen, who are mainly interested in getting the work done properly and only
indirectly in seeing that the charge is made correctly. When stores are ordered against a particular work order, there is a definite check by the head of the shops on over-ordering; at present there might be seven or eight or even nine issue notes against a sub-head such as that for Maintenance of Engines and Rolling Stock and it is impossible for the man in charge to see whether material has been over-ordered against any particular job or not.

Under the present system, in short, the responsible officer has to rely on constant vigilance in order to check waste; he has no system of figures behind him to help him. The Chief Mechanical Engineer has, in turn, to rely solely on the officer in charge; he has beyond that only the rather hazy check of the total amount spent on each sub-head each month as compared with a general knowledge of the work done.

I do not recommend the institution of any elaborate system of costing, a small locomotive repair shop, owing to the diversity of work, being less adapted to close costing than nearly any other type of shop, but I consider that the cost of the larger works such as the repair, whether heavy or light, or the erection of a locomotive should be kept; the costs of repairs to vehicles could be grouped by classes so that an average is obtained.

I attach even greater importance to the institution of a system of work orders, not only because this forms the first stage in any costing system, but in order to check over-ordering of stores and to ensure correct allocation.

The absence of any system in the Railways’ workshops is the more remarkable because in the Dockyard which is also under the supervision of the Chief Mechanical Engineer an excellent method is in force which could be adapted to the Railway shops.

Owing to the uncertainty of the future of Tanga, I do not recommend any change there for the present.

43. Another direction in which I think the methods employed in the Central line shops could be improved is by the introduction of timing work through the shops. Under this system, when an engine has come into shops and the work required on it has been detailed by the foreman or inspector deputed to examine it, a programme is drawn up showing the dates by which the various tasks have to be completed by each individual shop. This ensures that work will not be held up in one shop because another is behind-hand with its work for that engine. At present the sole method of ensuring that there is no delay is again only the personal supervision of the man in charge. Even if it is not possible to adhere strictly to the programme owing to interruptions caused by emergency work, this is better than no programme at all, because foremen in charge of shops have a better idea of what is ahead of them and can plan their work to better advantage. /
CHAPTER IV. – TRAFFIC DEPARTMENT.

44. The Traffic Department is organised in three districts, two on the Central line with headquarters at Dar-es-Salaam and Tabora respectively and one on the Tanga line.

At the time of my inspection the Dar-es-Salaam district, which comprises from Dar-es-Salaam to Tabora exclusive, was under the charge of the Deputy Traffic Manager who, in addition, assisted the Traffic Manager, more particularly in regard to general operation and rates questions. He also inspected, alternatively with the Traffic Manager, traffic working throughout the Railways, including the Tanga line. There was an Assistant Traffic Superintendent at headquarters and another Assistant Traffic Superintendent at Dodoma. The latter had no office and his duties were mainly inspection.

The Tabora district included the sections from Tabora (inclusive) to Kigoma and Mwanza and was in charge of a Traffic Superintendent.

There was also an Assistant Traffic Superintendent, Kigoma, who, like the one at Dodoma, had no regular office, his principal duties being inspection on the line and supervision of work at Kigoma.

Traffic on the Tanga line was in charge of a Traffic Superintendent with an Assistant Traffic Superintendent to assist him in his office.

The arrangement whereby the Deputy Traffic Manager had dual functions was unsound; he was prevented by the demands of the district work from giving to the Traffic Manager his full time assistance in the many difficult problems connected with the commercial side of traffic working, rates, encouragement and extension of traffic, and dealing with the public.

After consultation with me, the General Manager accordingly included in the Estimates for 1930/31 allowance for another Traffic Superintendent, cutting down at the same time the number of Assistant Traffic Superintendents by one. The establishment of Traffic officers therefore will consist of 10 in all, made up of 1 Traffic Manager, 1 Deputy Traffic Manager, 3 Traffic Superintendents and 5 Assistant Traffic Superintendents, in addition to an Office Superintendent. This cannot be considered excessive in view of the length of the Railways and their division.

45. The operation of traffic and the control of rolling stock are well regulated. Stock reports are despatched from all stations to district headquarters at 6.0 p.m. every evening and orders for working and distribution are despatched from there at 8.0 p.m. The Traffic Superintendent at Tabora informs the Dar-es-Salaam office the same evening of the arrangements he has made; this enables the latter either to rectify them if it thinks fit or to adjust the distribution arrangements. In practice, as a result, the distribution of stock is effected promptly and, considering the nature of the traffic, there is little delay. On the Tanga line there
were complaints from the merchants of shortage of trucks, but on investigation these proved to be due to insufficiency of stock rather than to its not being used to the best advantage. / 

In order to get better use out of trucks, the Railways undertake all off-loading of trucks at Dar-es-Salaam wharf; the work is done on behalf of the Railways by a contractor and a fixed charge of 5s. per four-wheeled, or 10s. per bogie truck, is levied. The system is a good one as it ensures that there is no delay in freeing the vehicles for traffic again and could, from the point of view of the Railways, be adopted with advantage at Tanga. The obstacle to adopting it there is that lighterage and stevedoring agents quote an inclusive charge for transporting certain exports from loaded in trucks at up-country stations to on board ship. The difficulty does not appear, however, an insuperable one and, in view of the advantages to the Railways as shown by the success achieved at Dar-es-Salaam, I would recommend that efforts should be made to initiate the system at Tanga.

46. The mileage obtained from goods vehicles is high but in this the Railways are helped by having an exceptional average haulage for their goods on the Central line, owing to the large proportion of traffic with the Belgian Congo. For this reason any comparison of either the mileage or goods ton mileage per vehicle obtained by these Railways with that achieved by others would not be a fair guide.

47. The average wagon load is good, the loading in 1928/29 on the Central line being 74 per cent. and on the Tanga line 75 per cent. per loaded vehicle.

48. The percentage of non-revenue-earning to total engine mileage is on the other hand high; in 1927/28 out of a total engine mileage of 1,123,829, 236,236 or 21 per cent. was non-revenue-earning; in 1928/29 the total engine mileage was 1,194,774 of which 291,305 was non-revenue-earning or 24-4 per cent. This is owing to the large number of fuel and water trains which have to be run. It will be seen, however, that there has been an increase in the percentage of non-revenue-earning engine mileage in the past year which indicates that there is scope for closer supervision over this aspect of the operation.

49. The despatch and delivery of single consignments is prompt. As a test an average was taken of all consignments from Dar-es-Salaam to Tabora during the month of July, and the transit time, allowing one day for receipt and despatch, worked out at 2 days 14 hours, a good figure, due mainly to the system of having fixed days at the more important stations for the acceptance of traffic for the various sections. Thus, goods are only accepted at Dar-es-Salaam for conveyance to the stations as far as Morogoro inclusive on Mondays, Thursdays and Saturdays. By this means quick delivery can be assured to the merchant; in fact this is incumbent on the Railways as a corollary to the adoption of the system. Good
wagon and train loading are also secured and there is a considerable saving in the amount of goods shed accommodation required.

This system was adopted from the Kenya & Uganda Railways where it was introduced as a result of the recommendation to that effect which I made in 1921. As an illustration of its advantages, the old goods shed at Nairobi, built in 1911, was under the old system of working badly congested in 1921, but as a consequence of the adoption of the ‘shipping day’ system it served without enlargement until 1928 despite the enormous increase in outwards traffic from Nairobi during that time. I have drawn attention to these points because the system is one which could be adopted with advantage by other Colonial railways. The main opposition to its inception comes from merchants, usually owing to the scheme not having been fully explained to them nor its advantages impressed on them. Those who have had experience of it are strongly in its favour.

50. From the foregoing paragraphs it will be seen that the operation of traffic on these Railways gives on the whole satisfactory results. The methods adopted are simple and direct. They depend for their success mainly on personal inspection and personal touch by the superior officer with the subordinate staff. While such a system is admirably suited for a concern which is not handling a large volume of business, it is incapable of adaption when the concern grows to any size. When that takes place, it is no longer possible for the senior officials to assure themselves by personal supervision that the business is progressing satisfactorily, that the means for handling it are being used to the best advantage and that no waste, either of staff or material, is taking place.

In order to be assured on these points they must have early information of the volume of business and of how it is being handled. Personal inspection is still necessary in order to keep the whole concern up to the mark, but it can no longer ensure a definite control of the undertaking; that can only be obtained through a complete and prompt use of statistics. At present the operating both of this and of the Locomotive Department appear, in fact, to be run by personal exertion rather than by system.

In the Traffic Department the statistics obtained are very complete but they are far from prompt. Stations have to compile comprehensive reports every month and very complete operating figures are compiled from the various traffic documents, such as the guards’ journals, but, apart from the train mileage and punctuality of mixed trains statements, the figures relating to the whole system are not ready for the Traffic Manager’s use until many weeks after the period to which they relate. At the time of my visit, for example, the principal statistics for June were not ready until the end of August. This was, I believe, an exceptionally bad case due to shortage of staff, but even in normal circumstances they appear to be seldom ready in less than two months.

Absence of statistics.
To cure the delays which occur in this and the Locomotive Department in the presentation of essential operating statistics, I suggested that the best solution would probably be to form a small Statistics Section in the Accounts Department which would compile the figures required by the operating departments. This arrangement would have the further advantage that it would prevent the waste of labour involved in two departments both preparing the same figures; for example, previously both the Traffic and Locomotive Departments prepared engine mileage figures, which seldom agreed, and further time had to be wasted in reconciling them. Also by concentrating the statistics work it would be possible to use one or two simple calculating machines and thus make a further economy in clerical labour.

A meeting was held by the General Manager of the heads of the departments concerned and it was settled that the system should be put in hand forthwith, the section being reinforced by four clerks, transferred from the Locomotive Department, who are now employed on statistical work at running sheds. With this reinforcement the Acting Chief Accountant said he would not require any addition to the staff allowed in the 1930/31 Estimates. / It was arranged that the section should provide the following statistics:

To be ready within 15 days of the end of the month to which they relate:–


To be ready within 21 days of the end of the month to which they relate:–

1. Net ton miles.
2. Earnings per ton mile.
3. Passenger miles.
4. Earnings per passenger mile.

To be ready within 45 days of the end of the month to which they relate:–

1. Table of financial results.
2. Statement of commodities.

The value of the statistics will be increased if figures are given showing the comparative figures for the previous month and for the same month of the previous year.

51. The present traffic yard at Dar-es-Salaam will be very soon inadequate for the growing traffic. At the time of my arrival it was proposed to replace this by a new yard which was to be roughly at right angles to the main line on a plot of land known as Grasse’s Shamba. The cost had been estimated at £85,000, and
an application for capital funds to this amount had been made to the Colonial Development Fund Advisory Committee, but without any rebate of interest.

A single-ended yard is always expensive and difficult to use; the movements are more complicated and slower, and if any hitch or accident occurs all work may be held up. Delays to train engines are increased and even if there is a double track from the main line to the yard, shunting operations may often have to be interrupted. All this means increased cost, more shunting engines required, more traffic staff, more overtime and mileage allowance to main line drivers.

In laying down a new traffic yard, it is essential above all to pay due regard to the probable requirements of the future. They require a lot of land and, if they are too small or badly designed, they have either to be removed to a new site when traffic expands or extra land has to be bought at a greatly enhanced figure. It is above all a case where an initial mistake entails heavy punishment.

In the report of the Consulting Engineers on the future development of the port a proposed approach railway is shown passing close to Grasse’s Shamba and serving the deep-water wharves which it is proposed shall eventually be sited on both sides of Kurasini Creek. If the configuration of the ground does not prohibit it, a good site for the new yard would appear to be along and in the vicinity of this line as it would be best placed for handling the port traffic which forms the bulk of the work. Part of the Grasse’s Shamba area is marked on the Consulting Engineers’ plan as being earmarked for bulk oil storage, but this is not definite and could no doubt be changed if necessary. It might also be necessary to divert the main road to Pugu, but this again does not appear an insurmountable objection. If this project is not feasible, whether by reason of the ground being too restricted or of unsuitable configuration, there remains the alternative of siting it further out along the main line and parallel to it, or it might even be feasible to combine the two projects. Any of these solutions seem preferable to the present proposal.

But, before a decision is taken, the subject requires to be explored more fully than it has been up to date. Proper schemes with approximate estimates should be prepared showing the lay-out and cost of the various proposals. When these are available, but not before, the advantages and disadvantages, present and future, financial and operating, can be weighed up; to take a decision in the absence of this information would be mere guess work.

The subject, in fact, requires closer study than it has received as yet; as a result of that closer study it may be found necessary to spend a larger sum than the £85,000 originally asked for. In the meanwhile that sum has been allocated by the Colonial Development Fund Advisory Committee, and I would recommend that it should be held in suspense and no expenditure incurred until the possibilities of other alternative schemes have been fully explored.
52. The Tanganyika Railways are one of the few remaining British systems with any considerable mileage in South, East or West Africa which still maintains the traditional British departmental system of operation. The South African, the Kenya & Uganda, the Rhodesian and the Nigerian Railways have all in turn abandoned it and adopted instead the divisional system, in which the movement of trains and the operation of traffic, the running of locomotives and the charge of the locomotive running as well as of the traffic staff, are combined into one department, in which are also included usually the responsibility for running sheds, the mechanical department being responsible only for the workshops and general repairs and maintenance of locomotives and rolling stock therein, as well as for their design and erection.

I do not propose to discuss here the advantages of this system for Colonial railways; it will be sufficient for the present purpose to say that in my opinion far better results can be obtained in the use of staff, locomotives and rolling stock by the divisional than by the departmental system, that all the railways which have adopted it, some of them on my recommendation, agree heartily with that opinion and that there is no instance on record of a railway which has adopted the divisional system reverting to departmental working. / In one respect the economies which the Tanganyika Railways could expect from a change are less than they would be normally. I refer to the possession of three separate workshops. Offices of the Mechanical Department would still have to be retained at all these centres, thus limiting some of the economies which could be made. But, despite this, I think the other economies in the shape of better co-ordination of operation and use of stock would be sufficient to justify the introduction of the divisional system. Another factor, however, enters in. The isolation of the Tanga line at present provides a strong argument in favour of a very complete divisional system including therein the maintenance of way and works, but in the event of that line being worked by the Kenya & Uganda Railways, which has already been recommended by at least two Commissions and will be recommended later in this Report by me, that argument will no longer exist. In fact, a different type of divisional control will be required according to whether that line is to be included or not. A third factor which must be considered is that, on a railway with as small a staff as this, the personalities of the officers who would be called on to introduce the change must be considered.

I understand that the opinion of the General Manager is that, while the divisional system must be adopted eventually, the present time is not opportune. With this opinion I am reluctantly compelled to agree, but I think that it should be the fixed policy of the Administration to endeavour to introduce it at the earliest opportunity. Such an occasion will probably arise when a final verdict has been given as to the future of the Tanga line and the way is clear to decide
the most suitable type of divisional organisation to adopt. I would urge that no effort should be spared to take advantage of the opportunity.

CHAPTER V. – MARINE DEPARTMENT.

[...]

CHAPTER VI. – HARBOURS AND WHARVES.

[...]

CHAPTER VII. – DOCKYARD AND SLIPWAY.

[...]

CHAPTER VIII. – STORES DEPARTMENT.

70. The Main Stores of the Railways are situated at Dar-es-Salaam; District Stores are maintained at Tabora and Tanga. In addition there are at Dar-es-Salaam Sub-Store for detail issue to the Locomotive Workshops, Dockyard and Electrical Department, situated close to the respective shops, yard and powerhouse. The Main Stores at Dar-es-Salaam have only recently been completed at a cost of about £40,000. Previously these stores had been scattered over several buildings, making supervision difficult and expensive. The lay-out and design of the new stores buildings and yard are good and allow ample room for future expansion. The fire precautions are good; hydrants are installed and the staff is trained in the use both of these and of the chemical appliances. There is also an electric alarm to the Workshops where the fire engine is housed.

71. In the Report which I made on these Railways in 1921 I recommended that the stores accounting should be transferred from the Accounts to the Stores Department, leaving the Chief Storekeeper solely responsible to the General Manager for all operations in connection with stores. This has been carried out in full as regards the stores accounting, but in theory the Chief Storekeeper is still responsible to the Chief Accountant, and in practice on the Tanga line the European Sub-Storekeeper is under the Assistant Chief Accountant, who is therefore the local authority responsible for stores matters. I am informed that there were special reasons for maintaining this organisation at an outstation like Tanga, but these reasons no longer exist, especially now that there is telephone communication between there and Dar-es-Salaam, and I recommend that the divorce should be made complete, that the Sub-Storekeeper at Tanga should be made responsible to the Chief Storekeeper, and that the latter should be directly responsible to the General Manager. If the Tanga line is worked by the Kenya &
Uganda Railways, it will not be necessary, of course, for the Tanganyika Railways to maintain any stores or stores organisation there.

72. The bulk of the stores are obtained from Great Britain on indent through the Crown Agents for the Colonies, purchases from this source in 1928/29 being £175,798 out of a total of approximately £218,000. The procedure follows the normal course and calls for no comment.

The largest proportion of the local purchases is for rations, as about 900 – 1,000 labourers of the permanent way and fuel gangs have to be rationed monthly. Here again the procedure, including submission to tender, follows the usual lines.

The indents for requirements at Tanga are prepared locally and then passed through the Chief Storekeeper, and stores from overseas are shipped direct to Tanga. Local purchases at Tanga are sanctioned by the Chief Storekeeper.

73. The stocks of general stores to be held at Dar-es-Salaam are based on maxima and minima which are entered against the items in the priced ledgers. The minimum stock is based upon six months’ consumption; if this minimum is reached, a fresh indent is at once sent to the Crown Agents. Normally, unless the minimum has been reached in the interval, the stocks on hand come up for review at six monthly intervals throughout the year. The new indents would normally be based on the previous six months’ consumption. As it may take a minimum of four months and a maximum of six months from the date of the indent to the date when the goods are received in the Territory, I do not consider a minimum stock of six months’ consumption is too large. /

74. Up to the time of my inspection there were no minimum and maximum stocks fixed for the Tanga Stores. It was explained to me that this was because there was until recently a large quantity of salvage stores there which prevented their getting down to a proper basis until it had been worked off, but that the ordering of new supplies was regulated on the basis of the consumption of the previous six months. The surplus stocks had been worked off by the time of my visit and the general stores held did not appear excessive. Orders were given by the Chief Storekeeper during my inspection to prepare the figures for maximum and minimum stocks based on the same standards as for the main stores and to enter the figures in the ledgers.

75. The District Stores at Tabora and the Sub-Stores at the Dockyard and Workshops are fed from the Main Stores.

The stores have recently been moved into other buildings at Tanga. At the time of my visit there were no fire appliances inside the buildings and only one hose outside; no instructions appeared to have been given to the staff in its use. The General Manager at once gave orders that suitable measures should be taken without delay.

75. The District Stores at Tabora and the Sub-Stores at the Dockyard and Workshops are fed from the Main Stores.
The first is under a District Storekeeper, and up to the time that the Main Stores at Dar-es-Salaam were in working order it was found necessary to maintain there a three months’ stock. The stores are housed in old sheds with, it is right to say, good fire protection by hydrants, but, if the principle of maintaining such large stocks is maintained, new buildings will have to be provided. The Chief Storekeeper was in favour of holding three months’ stock on the grounds that supply by rail to there from Dar-es-Salaam takes a good time and that no reduction could be effected in staff if the stocks were reduced. The General Manager was in favour of reducing stocks to one month’s supply. I agree with the General Manager; I do not think there is any justification for locking up so much capital in stores and buildings.

I consider that, if the minimum stocks are fixed at one month’s consumption and the store is fed monthly on indents from the Main Stores, ample margin is allowed for even such serious interruptions to traffic as were caused by the recent floods. To ensure the time and method of delivery, these stores could be sent by a special stores van on the monthly pay train. Priced ledgers would have to be maintained at Tabora to enable priced issue notes to be made out there and the minimum stocks to be held should be entered in these.

At Tabora there were large stocks of salvage stores, more particularly bolts and nuts, which had not yet been brought into store. In consequence of my recommendation the Chief Storekeeper was arranging to have these reconditioned and brought on to stores charge.

76. [...] 77. The procedure for the issue of stores is good. On the Central line there is a priced list of stores which is issued to all indenting officers; it is reviewed periodically and is kept well up to date. The present classification is that used by the Indian State Railways but, in order to assist indenting in Great Britain, the Crown Agents’ classification is being adopted. This is also simpler and, when it is in force, the Chief Storekeeper will be in a better position to insist on officers indenting according to classification. Two priced issue notes are sent out with the stores, whether delivered by rail or lorry, one copy being receipted and returned by the consignee. With the exception of the Engineering Department who have their own lorries and can collect for themselves, the Stores Department makes all local deliveries in Dar-es-Salaam from the Main Stores by its own light lorries, of which it has two. The monthly summary of issues is sent to indenting officers during the first week of the following month without fail. I was assured by the Acting Chief Engineer that these are usually received by the District Engineers within a few days of the month to which they relate, and they are thus enabled to ascertain their monthly expenditure promptly.

On the Tanga line there is no priced list of stores issued and the system of issue notes was different. Two unpriced issue notes accompany the goods and a
priced issue note for them is sent later. The consignee receipts and returns one of
the unpriced issue notes and retains the priced one. Although not so prompt as
the Central line system, there was no reason to complain of undue delay in the
receipt of summaries of issue notes. To have two systems, however, introduces an
unnecessary complication and the Chief Storekeeper gave orders during my visit
for the adoption of the Main Stores’ system at Tanga.

In view of the work entailed in issuing and printing a priced list of stores, I
recommend that this should be deferred until the future of the Tanga line has
been decided. If it continues to be worked by the Tanganyika Railway Admin-
istration, a priced list should be issued. Unfortunately that for the Main Stores
cannot be used as prices vary.

78. I satisfied myself that there was a proper system of check between stores
and tally cards and between tally cards and ledgers by the officials of the Stores
Department, quite apart from the stock verification by the officials of the
Accounts Department.

79. The Traffic Department on both lines issues traffic stores to stations up
the line; it has its own sub-stores for the purpose under a storekeeper, drawing in
bulk from the Stores Department as required. I think it is better for the Stores
Department to undertake this work; it has trained staff for the purpose and the
work of replenishment would be made simpler. On principle it is sounder to
confine the custody of stores as far as possible to the department whose special
duty it is. The Chief Storekeeper is prepared to undertake the work if he is pro-
vided with a fitted stores van attached to the pay train. If this was arranged, both
the monthly issue of stores to stations and the monthly replenishment of the
Tabora stores could be effected by means of the pay train.

80. Stores and spare parts manufactured by the Locomotive Department for
its own use are not passed through the Stores Department. This is wrong, as the
Locomotive Department can make any article it requires regardless of the cost
and of whether similar articles are held in the Stores or not. The Workshops
should not be allowed to make any spare part or item of stores without an order
from the Stores Department, / except in a case of emergency, and these should be
rare. The procedure should be that, when the Locomotive Department requires
these articles, it should indent on the Stores; if it knows they are not held by the
Stores, it can apply at once for an order to manufacture. When the articles are
made, they should be passed through the Stores books and priced in the same
way as stores supplied from any other source.

81. In certain directions it appeared to me that the Stores Department was
doing unnecessarily elaborate clerical work. Thus it notifies every department of
the arrival of all stores and sends them copies of all orders. All that appears to me
to be necessary is that it should notify a department of the ordering and arrival
of any particular stores which have been specially ordered for that department. It
is the duty of the Stores Department to keep its stores replenished up to normal requirements and it is unnecessary for it to notify other departments that it is carrying out this duty. If any department foresees an unusually heavy demand for any particular item of general stores, it should notify the Stores Department at once; it then becomes the duty of that department to take steps to meet the demand and to notify the other department when and in what manner it is able to fulfil its requirements.

The Tabora and Tanga Stores submit every month to the Chief Storekeeper lists showing the balance on hand of all stores. The Chief Storekeeper says this is necessary in order to let him know the actual position. These are long lists and to prepare them afresh every month entails a lot of work. There is a European in charge of each of these stores, and, provided the system of minimum stocks is properly observed. I cannot see that there is need for the Chief Storekeeper to get all this information every month.

82. The European staff of the Stores Department is 11; allowing for leave, 8 or 9 are always in the country. Of these one is at Tanga, one at Tabora, and one acts as Wharf Supervisor to superintend the receipt of stores from overseas. The Electrical, Workshops and Dockyard Sub-Stores are all in charge of Asians. There are thus normally always five or six Europeans, including the Chief Storekeeper, employed at the Main Stores. While the stores were scattered all over Dar-es-Salaam there may have been a need for all these Europeans, but the main justification for the expenditure of such a large sum of money on the new stores buildings and yard was to make supervision easier and more economical. If there is to be no reduction in staff, it is hard to justify the expenditure of the money. The necessity for this number of Europeans cannot be attributed to the possession of two separate lines because there is only one European normally at Tanga. The turn-over of the department, i.e., the sum of the value of receipts and issues, in 1928/29 amounted to £543,524; the total stock in hand is normally only about £130,000 to £140,000. I consider that, with the excellent facilities now available, a staff of eight to nine Europeans always in the country is out of proportion to the business handled.

The General Manager agrees that the staff is excessive; in order not to delay the Estimates for 1930/31 he did not alter them but proposed instead to reduce the number actually employed by one during the current year and probably by a second in the year after. I think that such a reduction is the minimum called for. A total establishment of 11 will still allow four Europeans permanently for work in the Main Stores and Head Office, which I consider a more than ample provision.
CHAPTER IX. – ACCOUNTS DEPARTMENT.

83. The office of the Chief Accountant and the office of the General Manager have hitherto been amalgamated with a view to economy. I have forwarded a special Report pointing out that with the growth of business this arrangement has outlived its usefulness, and recommending that the two offices should be divorced, separate establishments being laid down for each.

Examination of Colonial railway accounting by a trained accountant.

84. I do not propose to enter into a detailed review of the work of the Accounts Department, because I am informed that it is intended that an accounting expert shall report on the methods of accounting on Colonial railways.

I examined generally, however, the various sections of the Department and satisfied myself that the usual procedure of accounting in force on Colonial Government railways was pursued, that the staff employed to carry out that procedure did not appear excessive, and that the traffic audit, the inspection of station accounts, and the verification of stores were carried out systematically.

For some time past I have been impressed with the necessity for a review of the methods of accounting on Colonial railways by a trained accountant. On most of the railways which I have inspected the system of control has appeared to be cumbrous and extravagant in labour, relying on a multiplicity of checks and counter-checks, which are replaced, I believe, in modern practice by control ledgers and accounts. Not being myself a trained accountant, I have hesitated to criticise it in detail, except in regard to traffic audit of which I can claim some knowledge. My impression has been confirmed by the Report made recently by Sir Arthur Lowes Dickinson at the invitation of the Indian Government on the System of Accounting, Audit and Statistics of the Indian Railways. The accounting methods on Colonial railways have been based to a certain extent on this model, and the criticisms in the Report and the recommendations for improvement appear to me to apply with great force to Colonial railway practice. I therefore feel sure that an inspection by an expert would have beneficial results.

85. I also recommend that the expert should be asked to report on the work of the Railway Audit Department in relation to Colonial railways, just as Sir A. Lowes Dickinson reported on the relations between the Railways and the Auditor General in India.

An auditor of a private railway company is expected, to quote ‘Railways’ by W. V. Wood and Sir Josiah Stamp, ‘to make a reasonable and proper investigation of the Accounts in the interests of the Shareholders, as he acts on their behalf and not on behalf of the Directors. He cannot, by reasons of the magnitude of the work, examine every transaction, and he is authorised by Parliament to employ assistants who, in fact, perform a continuous audit, so that the closing
of the audit follows shortly after the Accounts for the year are completed. The Accounts in a special statutory form, and not merely the Balance Sheet, require to be certified by the Auditors; their certificate stating that the Accounts are a full and true statement of the financial condition of the Company and that the dividends proposed to be paid are, in their judgment, bona fide due. If necessary, this certificate is qualified by directing attention to particular matters which the Auditors think of importance, and the Annual Meeting, when the adoption of the Accounts is considered by the Shareholders, has that certificate before it in the printed Accounts. / 

Unlike the auditor of a private company, the Colonial Audit makes no attempt to carry out what I may call the higher duties of audit; it gives no advice or criticism on financial policy, on such important matters as the course to be observed in respect of depreciation or the use of revenue for financing capital expenditure. Its work is confined principally to carrying out a minute check of all accounting documents, such as those connected with pay and traffic invoices, most of which, if not all, have been checked already by the Accounts Department. The auditors of a private company only make test checks of this nature sufficient to show that the accounting and internal check system of the railway itself are being carried out properly.

The Audit Department thus does not touch at all one, and in many ways the most important, side of what are usually considered an auditor’s duties; while it carries out the rest in far greater detail than has been found necessary in commercial practice.

The difference is expressed to a certain extent in the manner of signing the annual accounts. In place of the comprehensive certificate of private auditors that the accounts present a full and true statement of the Company’s affairs, the Colonial Auditor merely signs the accounts as ‘Examined.’ Such a certificate carries little or no responsibility with it. Incidentally, the annual accounts of the Tanganyika Railways are signed by neither the Chief Accountant nor the Auditor, a rather remarkable omission.

The Tanganyika Railways have to pay for this detailed examination, which private railway companies have found superfluous, £4,000 a year or 1/2 per cent. of their total receipts, a sum entirely out of proportion to the fee which the auditors would receive from a railway company of the same size for a commercially satisfactory audit of its business.

The Audit Department has no option but to carry out this detailed check; it is enjoined by Colonial Regulations. I have no wish to imply that it employs more men or spends more money than is necessary in order to do the work required of it by these Regulations. But it appears to me that, in so far as railways are concerned, the regulations which are framed to protect the interests of the proprietors, the Government, require amendment, and it is because I feel sure
that it should be possible in return for a much smaller expenditure to provide an audit of greater value to the proprietors that I lay stress on the importance of including this question in the terms of reference of the accounting expert.

86. I have explained earlier in paragraph 50 the recommendations which I made locally for the formation of a small Statistics Section in the Accounts Department. It was agreed that these would be put in force at once. The concentration of the work will in itself mean that staff can be economised, and will enable simple calculating machines to be used and so effect further economies. The Acting Chief Accountant stated that he would be able to carry out the extra work without additional staff if four clerks now employed on statistical work in the Locomotive Department were transferred. I think that it would be wise also to examine the work of other branches of the Accounts Department and see whether one or other of the various types of simple and comparatively cheap machines now on the market could not be introduced with advantage.

87. The system for compiling pay-sheets for native labour along the line is to my mind by no means satisfactory. To illustrate what takes place at present I am taking the Engineering Department because its labour is most scattered and therefore presents the greatest difficulty. The muster rolls on which the boys’ attendance is marked are sent in by Permanent Way Inspectors to the District Engineer’s Office on the 20th of the month. The boys are marked in advance on these muster rolls as being present for the remaining ten or eleven days of the month. From these in turn the District Engineer’s Office compiles the salary sheets. This is a long task as the name, number and rate of pay of each boy has to be filled in; the check to see that the distinctive number is right in each case, a point on which great stress is laid for identification purposes, is in particular a lengthy process. These salary sheets are not sent in to Dar-es-Salaam or Tanga but are picked up from the District Engineer’s Offices en route by the pay trains, which usually leave their respective headquarters either on the last day of the month or the first day of the next month. The Permanent Way Inspectors and Gangers, who are present at the pay, notify the officials on the pay train of any deductions which are necessary owing to a boy’s absence after the muster rolls were sent in, and the pay-sheets are endorsed accordingly. By these means all payments along the line have been completed usually not later than the 5th of the month.

The system of entering the boys in the muster roll for ten days or so ahead is, I consider, radically unsound. It reverses the ordinary process in that, if a Permanent Way Inspector or Ganger is careless, if a correction sheet is missing or the Permanent Way Inspector has omitted to visit the gang and check it, the boys get more pay than their due. Any mistake or carelessness acts against the Railways. A more serious objection is that it leaves an opening for carelessness and perhaps for fraud, and teaches the men in charge of labour and their clerks, in most cases
half-educated natives, to enter up imaginary figures in an important accounting document. It cuts at the very root of proper accounting and such teaching often bears unwelcome fruit.

In defence of the present system it is claimed that it was brought in on the demand of the Labour Department which is very insistent that boys must be paid within a day or two of the end of the month and should not be kept waiting for their pay after they have left work. This argument loses much of its force because the boy does not leave work only at the end of the month. The only way of ensuring that he gets his pay the instant he leaves is to give every Permanent Way Inspector an imprest account, which is clearly out of the question.

The Acting Chief Engineer proposed as an alternative that there should be two muster rolls for each month. The first, as now, would be sent in by the Permanent Way Inspector to the District Engineer’s Office by the 20th of the month; from it the District Engineer’s Office would enter on the salary sheets the details of names, numbers and rates, the laborious part of the work. At the end of the month the Permanent Way Inspector would send in the second muster roll which would be for the period from the 21st to the end of the month. To fill in from these on the salary sheets the days worked in the second period and to make up the total is a comparatively easy task which the Acting Chief Engineer estimates should not take more than one day in the District Engineer’s Office. Allowing two days for the muster roll to reach the District Engineer’s Office, one day for completion of the salary sheet, and one day for unforeseen delays, the pay train should always be able to start work at the latest by the morning of the 5th of the month. With three pay trains on the line, as proposed for the future, the payment can be completed in four days. Even if another day is added for possible delays, which makes the large allowance of two days out of nine for unforeseen contingencies, all on the line would receive their pay not later than the 9th and most of them by the 7th. I do not think that this can be considered too long, especially if it is remembered that the bulk of the boys along the line are in employment of a permanent nature.

This scheme was discussed with the General Manager and the heads of the departments more closely concerned. The principal doubt appeared to be that putting back the date of payment would have an unsettling effect on the labour. There is already a certain amount of competition for labour, more particularly on the Tanga line, and plantations have an advantage in that their labour is all concentrated and can be paid at short notice.

The effect on the railway boys could be minimised by introducing the delay in stages and not throwing the whole change on to one month. No final decision was taken, but the Acting Chief Engineer was instructed to make enquiries amongst his officers as to their opinions. It is impossible for one who has spent only two months in the country to gauge the extent to which labour would be
affected, but the present system is so inherently wrong in its principle and teaching that I would urge the Railways to make serious efforts to change it, if it is at all feasible. /

CHAPTER X. – PASSENGER SERVICE AND FARES.

88. The passenger service on the Central line consists of one mail train a week in each direction between Dar-es-Salaam and Kigoma; this connects with the sailings of the ‘Liemba.’ In addition there is a service of five mixed trains from and to Dar-es-Salaam a week, terminating at Kigoma, Tabora, Dodoma, Kilosa and Morogoro respectively, the last named being available for third class passengers only. On the Mwanza branch there are two mixed trains a week each way, one of which connects with the mail train service.

This service appeared adequate and such complaints as I received were directed rather at the want of accommodation on the trains than at the inadequacy of the service.

The majority of the complaints were made by Indian Associations and related to overcrowding in third-class carriages. When I discussed the complaints with the Associations, it became apparent that their main basis was that on night journeys the accommodation was often fully occupied and passengers had therefore to sit up the whole night. Although this cannot be described as comfort, it does not constitute, as I explained to the Associations, a greater degree of discomfort than is experienced by third-class passengers all over the world. The third-class passenger cannot expect lying-down accommodation in return for the low fare he pays. Occasionally, no doubt, overcrowding does occur as on most railways, but the Administration is, I am satisfied, watching the situation and is purchasing more stock to meet the increased demand.

I received one or two complaints as to overcrowding in first-class carriages, and undoubtedly in one or two cases this also occurs. New stock is on order which should remedy it.

89. The actual accommodation provided for first and second-class passengers is of a high standard. In fact in one particular I think the accommodation provided is out of proportion to the fare paid. I refer to the latest second-class carriages. In these all but two of the compartments are two-berth coupés. Except for the fact that they are an inch or two narrower and have no reading lamps at the head of the bunks, these coupés are identical in appointment with the first-class ones. The second-class passengers are also allowed to use the first-class dining saloon. The cost of two second-class fares from Dar-es-Salaam to Kigoma is 249 shillings as against 224 shillings 10 cents for a single first-class fare. The passenger can, therefore, if he books in time, obtain by paying only about 10 per cent. extra a second class compartment to himself whereas, if he went first-
class, he would have to share his compartment, perhaps with a stranger. From the railway point of view he occupies twice the space for the same fare. If the passenger does not care to pay for two fares, he can enjoy at practically half the fare in the second-class the same comforts with a few trifling exceptions as he could obtain in the first-class. This disproportion requires correction; the best method of doing so would be to convert these latest second-class carriages into first-class for use on less important trains.

90. There has been a strong growth of passenger traffic on this line in all classes, the receipts for the year 1928/29 showing an increase of nearly 20 per cent. over the previous year. / Absence of motor competition.

So far the competition of motor traffic has not been felt to any appreciable extent on the Central line. The reason for this is the absence of any good road out of Dar-es-Salaam towards the west, but this situation is almost certain to change with the completion of the bridge over the Ruvu and of the road from Dar-es-Salaam to Morogoro. As this competition affects not only passenger but goods traffic, I am dealing with the general question in Chapter XV, – Future Policy and Development.

91. On the Tanga line the service provided consists of a mail train between Tanga and Moshi twice a week in both directions and a mixed train between Tanga and Korogwe daily, which extends to Buiko on three days in the week. The coastal area for a distance of 50 miles or more inland is well populated and the competition of motor traffic has already made itself felt to a serious extent. In fact the Traffic Superintendent reports the growth of passenger traffic on the Railway as being at a standstill, whereas previously there had been a substantial increase every year.

To combat this competition the Railways have bought two Sentinel rail cars, which should be in service by the time this Report is published. It was proposed to use these cars to run one service a day each way between Tanga and Korogwe. While I am in favour of the use of these cars owing to the cheapness of operating them, I think that the service proposed is too small to get an adequate return out of the capital involved. No profit can be expected if the distance run by each coach is limited to some 50 miles a day. Either the service should be extended beyond Korogwe if the population justifies it or a better service should be given within that zone.

92. The fares charged are 3.456d. a mile for first-class and 1.92d. a mile for second-class passengers. The third-class fares are based on a falling scale ranging from .576d. per mile for distances up to 62 1/2 miles, to an average of .353d. per mile for the maximum distance of 773 miles. Labourers in batches of 10 are granted fares at three-fourths of the above scales. A proposal has been put forward to raise the third class fares to the same level as those on the Kenya & Uganda Railways, which are roughly about 50 per cent. higher. This would
presumably apply only to the longer distance traffic because to raise the short distance fares in the face of the growing motor competition would be suicidal. But even to this I am strongly opposed on account of potential motor competition and because I consider a higher rate than 1/2d. a mile is unsuited to the economic situation of the native passenger and definitely stifles travel. This has been proved in Nigeria and ‘Iraq where, as the result of my recommendations, third-class fares were reduced in the first case from 3/4d. to 1/2d. a mile and in the second case from 1 1/8d. to 1/2d. a mile. In both cases the Administrations have recognised in their Annual Reports the benefits derived from the reductions. To take the opposite step and raise the fares would put a serious check on native travel and this would affect not only passenger but goods receipts, because travel by the native undoubtedly stimulates trade.

93. One step which the Administration might take to stimulate travel would be by the issue of mileage tickets. The prospective passenger under this system buys so many hundred or thousand miles of travel from the railway and he can use that mileage anywhere he chooses on the system and at any time. In return for buying his travel in quantity he gets it at a reduced rate. It has been adopted on many railways with success and is well adapted in particular to the needs of commercial travellers.

94. The catering on the dining cars on both the Central and Tanga lines is done by contract, with different contractors, however, for the two lines. I received unsolicited evidence from more than one member of the travelling public that both the present services were satisfactory.

A proposal was, however, put forward that the Railways should institute a Catering Department of their own. A catering business is always one of the most difficult to run; it depends more than the ordinary department on the personality and experience of the man in charge and these difficulties are accentuated when a new catering department has to be started. Moreover, a railway with so small a traffic as this cannot hope to make a substantial profit out of catering; its first concern must be to give satisfaction to its passengers without losing money in doing so. The present contracts appear to fulfil these conditions. I therefore recommend the retention of the existing arrangement, provided, of course, that the service is not allowed to drop below the present standard.

CHAPTER XI. – GOODS SERVICE AND RATES.

95. The most striking feature of my inspection of the Tanganyika Railways was the absence of complaints about the rates for the carriage of goods, whereas my usual experience has been that they form one of the most frequent and important items on the agenda of meetings with Chambers of Commerce and other public bodies. This is the more remarkable because in the process of assimila-
tion of rates on the Tanganyika and Kenya & Uganda Railways many have been raised quite recently, and also because low transit rates are in force for traffic to and from the Congo. The only complaints, in fact, which I received related to the rates on medicines, confectionery and fertilisers, and a request from the Indian Association at Tabora for the replacement of taper rates by rates based on a uniform charge per mile.

The first three were minor points in which it was not necessary for me to intervene and, but for my presence, would have been settled directly with the General Manager. With the last point I will deal later. In consequence of the general absence of complaint about rates, it will only be necessary for me to refer shortly to the whole subject.

96. The most important feature of the rates structure is the tariff of special transit rates to and from the Congo. Under the Convention of the 16th March, 1921, the Belgian Government has the right to convey goods in transit free from customs dues between its ‘leased site’ areas in Dar-es-Salaam and Kigoma. The exports consist mainly of copper and cassiterites but the imports are varied, a large proportion being railway and constructional material and motor cars.

In order to attract this traffic, to which at least one alternative route is open, it was necessary to quote low rates, and the success attending this is illustrated by the fact that in 1928/29 the receipts from this traffic were more than 40 per cent. of the receipts from the Central line and more than a third of the receipts of the whole Railway System. It is thus to the advantage of the other users of the Railways that these low rates should be granted, because without this traffic the system would certainly be running at a heavy loss and it would be necessary to raise other rates and fares, unless the Government was prepared to grant a large subsidy out of general revenue.

Other routes to the Katanga district of the Congo, where the copper mines are situated, are being opened and the competition will become keener. The General Manager is of the opinion that, while the Railways will not in the face of this competition be able to get any increase in the traffic with this particular area, they will probably be able to hold what they have already and that there will not be any actual decrease in revenue on this head. I think this is a reasonable view of the prospects.

Fortunately large developments, both mineral and agricultural, are taking place in districts of the Congo closer to Tanganyika Territory than Katanga is. The most important of these are to the north and north-west of Lake Tanganyika. The Belgians are also building a railway from Lake Tanganyika to Lake Kivu with a branch to tap the rich and densely populated areas of Ruanda and Urundi. The natural outlet for these developments is via the Central line and it will obviously be the policy of the Tanganyika Railways to attract and foster
this traffic, quoting special rates where it is thought advisable in order to meet competition. / 

97. As a consequence of the consideration given to the question by the Commission on Closer Union, the Kenya & Uganda and Tanganyika Railway Administrations arranged to assimilate their rates as closely as the respective conditions which obtained on the two systems permitted. They have been so far successful in this that at the present time the rates on imports are identical and those on some of the exports have been approximated. Before complete assimilation can be effected, an agreement remains to be reached on the question of preferential rates on local produce. As this is, at the time of writing, under discussion at the Customs Tariff Conference at Nairobi, it will be in opportune to review it in this Report.

Arrangements have also been made between the two Administrations for the introduction of through booking on all classes of traffic, both coaching and goods. This arrangement includes an agreement whereby a person dispatching goods from one system to the other will obtain the same advantage on a tapered rate as if the whole journey was made over one system, each Administration receiving its mileage proportion of the tapered rate. Previously the consignor would have had to pay the sum of the rate to the frontier and of the rate from the frontier to destination, thus losing the advantage of the full taper on the total distance hauled.

98. The Indian Association at Tabora put forward the request that, instead of rates, as now, being tapered and therefore the charge per mile becoming less as the distance increases, each class should be charged at a uniform rate per mile, irrespective of the distance hauled. The reason for this request is that formerly Tabora acted as a distribution centre for the area round Shinyanga and Kahama. Since the branch to Mwanza has been built, it is cheaper with the tapered rates to consign goods direct from Dar-es-Salaam to stations on the branch rather than to send them to Tabora and redistribute from there. Tabora is consequently losing some of its trade and importance.

This result of tapering rates, the concentration of the distributing business at the coast to the detriment of up-country centres, is well known; the example which is most frequently cited is that of Australia. The usual method of curing it is not to revert to the unscientific basis of uniform rates per mile, which penalises by heavy freights those who live at the far end of the line and thus checks development, but to have special low distribution rates for traffic from specified up-country centres, which are thus placed in a position to compete on favourable terms with the coastal towns. In the tariff which I drew up for the Uganda Railway in 1921 to replace the old uniform rate per mile tariff and which remains in its essential features and in most of its principal charges as the tariff now in force, I adopted this method. I can therefore claim to be in favour
of its application, where appropriate, but I do not think that Tabora can claim to be on the same footing as Nairobi or Jinja, or to be an established distributing centre in the same sense as those places were in 1921. Nor does it seem in the interest of the Railways to introduce artificially the complications and extra work and handling of a distributing centre, where it can only be said to have existed in a very modified form previously. It would entail establishing a distributing centre and distribution rates for every new branch line. In certain cases this may be justifiable but, before the Railways can be expected to incur extra expenditure on double handling, clerical staff and extra work, there must be a large established trade which it would be to the detriment of the country to disturb, as would have happened in the case of Nairobi or Jinja. I do not think that Tabora can claim this.

The remedy for the Tabora merchants appears to be to establish agencies at the new centres, like Shinyanga and Bukene. Unfortunately the country to the south, outside what may be called the area of Tabora itself, does not hold out good prospects, thus limiting the possibilities of establishing a distributing trade in that direction, but it provides a further argument against the establishment of Tabora as a distributing centre.

99. [...] 

100. In the tariff system which I drew up for the Uganda Railway the principle was introduced of carrying the more valuable goods, in this case those in the five highest classes, at Railway Risk only; the five lowest classes are at Owner’s Risk, but Railway Risk conditions can be obtained on payment of 10 per cent. additional freight. In my previous Report on the Tanganyika Railways I recommended the adoption of this system there also. I am glad to be able to record that on the Tanganyika Railways it works satisfactorily, and also presumably on the Kenya & Uganda Railways as it is still in force there.

With the terms of the liability which falls on the Railways in the case of carriage at Railway Risk I have no fault to find nor with the margin of 10 per cent. extra charge made for the additional liability incurred by the Railways in carrying at Railway as opposed to Owner’s Risk. I am of opinion, however, that the liability of the Railway under the Owner’s Risk conditions is too limited. The definition reads as follows:–

‘O.R.’ or ‘Owner’s risk’ shall mean that the transport of the goods is undertaken by the Administration on the special condition that the Administration shall not be liable for loss, damage or shortage except upon proof by the consignor that such loss, damage or shortage was occasioned by and through the wilful misconduct or malfeasance of the Administration’s servants.’

Under these conditions the onus lies on the consignor to prove that there has been wilful misconduct by the Administration’s servants. In the absence of definite proof of an act of wilful misconduct the consignor has no legal redress, even
in the extreme case of loss of a whole consignment, whose receipt the Railways admit. This view is upheld by the judgment of the House of Lords in the case of H. C. Smith, Ltd. versus the Great Western Railway Company,\(^6\) where the conditions of carriage were similar to those on the Tanganyika Railways.

I think such conditions are not only unfair to the owner but are in principle unsound from the Railway point of view, because it may lead to a tendency that the loss or damage of articles carried under such conditions is not of great importance. It is fair to say that I saw no such tendency on the Tanganyika Railways. I was assured on the contrary that the Railways pay claims in the case of losses of complete / consignments or complete packages or where it was obvious that there was gross carelessness on the part of the Railway staff. The Railways, in short, recognise the harshness of the conditions but interpret them leniently. It is wrong, however, that the possibility of redress open to the owner should rest solely on whether the Railways adopt a liberal attitude or not. The attitude adopted by the Railways may change in course of time and they may insist on the full rigour of the conditions before they will admit liability.

I would recommend the introduction in their stead of the standard conditions of carriage at Owner’s Risk adopted by the Railway Rates Tribunal of Great Britain. This body was formed under the Railways Act of 1921\(^7\) and, not only does it carry great weight as being impartial and representative, but it had the advantage of hearing the views of both Railways and traders argued in front of it by the best legal brains before it framed the conditions. They read as follows:–

‘The Company shall not be liable for loss, damage, deviation, misdelivery, delay or detention of or to a consignment or any part thereof, except upon proof that the same arose from the wilful misconduct of the Company or their servants. Provided that nothing in this condition shall exempt the Company from any liability they might otherwise incur in the following cases:–

‘(a) Non-delivery of the whole of a consignment or of any separate package forming part of a consignment, properly packed, and addressed in accordance with Condition I hereof, unless such non-delivery is due to accidents to trains or to fire.

‘(b) Pilferage from packages of merchandise protected otherwise than by paper or other packing readily removable by hand, provided the pilferage is pointed out to a servant of the Company on or before delivery.

‘(c) Misdelivery, where merchandise addressed in accordance with Condition I hereof is not tendered to or placed at the disposal of the consignee within 28 days, or in the case of perishable merchandise within a reasonable time, which shall not be less than 72 hours after receipt of the consignment by the Company to whom the same was handed by the sender.
‘Provided, however, that the Company shall not be liable in the said cases of non-delivery, pilferage or misdelivery upon proof by them that the same has not been caused by the negligence or misconduct of the Company or their servants.’

It will be seen that, while in general the onus of proof lies on the owner, the Railway has to prove, in cases where non-delivery of a whole package, obvious petty pilferage or misdelivery has occurred, that it was not due to the negligence or misconduct of its servants. The conditions will, of course, require amendment as regards sub-paragraph (c) in order to suit local circumstances but, apart from that, they appear to me to treat both parties to the contract very fairly. They cannot be said to bear hardly on the Railways and are well adjusted to the more rigorous conditions which are imposed on the Railways for carriage at Railway Risk and in return for which the Railways receive additional compensation.

101.[...]

102. The system of consigning and invoicing goods follows the general lines of the system which I recommended in 1921 should be adopted both here and on the Kenya & Uganda Railways to replace the more cumbrous methods then in force. The main features of the new system are that the consignor presents a single consignment note; these differ according to whether the goods are to be despatched at Railway or Owner’s Risk and have the conditions printed on them. To simplify working, the various types of consignment note are coloured differently. In this way there is no need for separate risk notes. At the bottom of the form is a perforated section printed on the reverse side which is turned up by the booking clerk to lie against the main body of the consignment note. The columns for weights, charges, etc., are printed on the perforated slip as well as on the portion of the main consignment note against which it lies. The booking clerk can thus, with carbon paper, fill in the details and charges on both and has merely to tear off the slip and give it to the consignor as his receipt. This is an ingenious improvement on the method of duplicate consignment notes which I proposed. The invoices are then prepared from the consignment notes, all consignments from that station to any other station being entered on the same invoice form, so far as space allows. The consignment notes are progressively numbered by the dispatching station, and this number is repeated on the invoice and on the package.

The system has the advantage from the point of view of the Railways that it economises staff and stationery and gets the consignor out of the goods shed much more promptly than the old multiple invoice system. The last point is of importance, as the greater the number of people in the goods shed, the greater the risks of and opportunities for pilferage. From the point of view of the consignor it has the advantages that he has fewer documents to prepare and he or his representative is not kept in the goods shed waiting while a separate invoice is being prepared for every destination to which he may be dispatching goods.
I have entered into a little detail in describing the system because I consider it is so admirably adapted to other Colonial railways. I have, in fact, recommended its adoption elsewhere but with little success in certain cases. The opposition to it appears to arise from fear of trying a system novel to Colonial railways, and to be shared by both traders and railway officials. The success which has attended its use on both these and the Kenya & Uganda Railways should act as an inducement to both merchants and traffic officers elsewhere to join in abolishing the old cumbersome, time-wasting methods.

CHAPTER XII. – STAFF QUESTIONS.

103. The most important staff question with which the Tanganyika Railways are faced is the training of the native. From its early days this Administration has taken active measures to train the native to undertake skilled work on the Railways and I was able in my 1921 Report to comment favourably on the progress made, and as a result of my recommendations the establishment of European artisans was increased to enable manual instruction to be given. The high cost of the imported Asiatic, when his passages, leave, housing and allowances have been counted in, has acted as an incentive to persevere in these efforts.

In the Locomotive Department there is a regular scheme for training indentured apprentices, and the training of older natives, who are too old to be apprenticed, is also undertaken. There is a hostel under the Education Department at Dar-es-Salaam where some of the railway apprentices are lodged, and the Locomotive Department has its own hostel at Tabora with accommodation for 37 indentured apprentices. There has been a noticeable improvement in the physique of the boys since these hostels were started. At Tanga the Locomotive Department has 17 apprentices but no hostel. At both Dar-es-Salaam and Tanga a fair number of improvers are passed on from the Education Department to the Railways. In the Traffic Department boys are obtained from the Education Department after they have learnt their elementary education and are then taught telegraphy and station duties in the Railway Telegraph School. At Tanga the Education Department has its own Telegraph Training School and from this the Railways draw some of their recruits. Thirteen were so transferred a year ago and of these it has up to date only been necessary to get rid of one. The Engineering Department has no regular training school or scheme at present.

As a result of the efforts made a certain measure of success has been attained; to take examples, all the guards employed on the Tanga line are African and so are most of the signallers throughout the system. There are also a few good African station-masters and booking clerks. The District Engineer on the Tanga line reports that he has some quite good African sub-permanent way inspectors and carpenters. But in every department I met with the same complaint, that when
the African staff had been trained up to a certain standard they appeared to slacken off, partly owing to lack of ambition, partly from the false idea that they were already entirely proficient. This was the comment of all departments, given independently, and applied both to the clerical staff of the Traffic Department and to the operative staff of the Locomotive Department, who had no clerical training. A further handicap is their objection to being moved away from their own home stations, which extends even to not caring for work such as guards’ or drivers’ which entails absence from home.

While this is disheartening to those who have expended so much effort on training the native, it is encouraging to note that the officers of the Administration do not look upon these results as in any way final. On the contrary, their view, as expressed by the General Manager, is that technical education has reached a dead-centre which will have to be surmounted. The old uneducated African learnt the rudiments of a trade by imitative methods and, considering his limitations, often did excellent work. The present man, who has only the most elementary education, gets a smattering of a trade and thinks he is fully qualified. He is encouraged in this belief by the ease with which he can get a job elsewhere, more especially on motor work. When a better stage of education has been reached, not only will the man be able to absorb his training better but he will have a better appreciation of his own deficiencies, and the Railways will be able to build up a better class of tradesman.

Whether the last-joined apprentices from the Education Department have reached this stage remains to be seen. But, whether they have or not, the Administration does not intend to relax its efforts. It was also encouraging to note the co-operation between the Education Department and the Railways, and the recognition, not only in departments like the Traffic where the progress of employment of the African must obviously depend on the spread of education, but also in other departments where the connection is not so obvious, that the success of any scheme of training the native must depend largely on the success attained by the Education Department.

104. A Provident Fund for the Railways has recently been started and every railway servant with a salary of not less than 60 shillings a month, who is not qualifying for a pension, has to contribute towards it one-twelfth of his monthly salary. On their side the Railways contribute to the Fund the equivalent of 75 per cent. of the man’s contributions, which may be raised up to a limit of 100 per cent., provided the total Railway contribution is not thus raised to more than 1 per cent. of the net earnings. In practice the 75 per cent. level has not yet been passed.

This clause is a feature of the Provident Funds of most Colonial railways and it is rare to find that the condition permitting the full 100 per cent. to be paid is fulfilled; presumably the object of the clause is to hold out an inducement to
railway servants that if they succeed by their efforts in increasing the net earnings they will obtain a better bonus on retirement. As an inducement to better work by the staff, I have no hesitation in saying that this clause has had no effect whatever and I have no doubt that all the General Managers would agree. I do not think that it ever enters into the minds of most of the staff to connect the two things. Very few know of the existence of the clause or how it is worked, and those who do realise how little their individual efforts will avail to obtain a small increase in the bonus which they will receive in a future, which is probably still remote. Furthermore, it is wrong that a large corporation like a Colonial railway should contribute to the Provident Fund which it establishes on behalf of its servants a smaller sum than it forces them to contribute. I know of no railway or large corporation in Great Britain which insists on its employees contributing to its Provident or Superannuation Fund more than it does itself. It is even more unfair in a Government-owned railway to base the bonus on net earnings when the policy of the owners is often directed to keeping net earnings down to a low figure. I therefore recommend most strongly that on the Tanganyika Railways the bonus to be contributed normally by the Railways to the Provident Fund should be equal to that contributed by the employees irrespective of net earnings, and I trust that this principle will be extended to other Colonial railways.

105. On the Tanganyika Railways about 70 of the senior posts are pensionable. The holders of these posts will probably have started their service as contributors to the Provident Fund. When they are promoted to a pensionable post, they receive their part contribution to the Provident Fund with accrued interest, but not the Railway bonus. I have several times in the past pleaded that the system of pensions should be abolished / entirely and that the Provident Fund should be made applicable to all grades from the artisan to the General Manager. The reasons which I have advanced for this recommendation are that under a pension system it is hard to get rid of a man who has a general low level of efficiency. Provided he avoids any gross acts of neglect or inefficiency, he is reasonably safe, and this obtains more particularly when he is within a few years of reaching the age for retiring on pension. If nothing can be given to a man before he reaches a certain age, there is a natural disinclination to get rid of him before that age when he will have, perhaps, no provision for the future whatever. The highest efficiency cannot be reached in such conditions. With a Provident Fund a man can be got rid of whenever the interests of the railway service demand it, irrespective of his standing or his length of service. Another advantage is that with a Provident Fund a railway makes provision year by year for its liability whereas in a pension system the amount of the liability is uncertain and is not provided for as it occurs.

In the Tanganyika Railways it will be comparatively easy to introduce a Provident Fund system because, generally speaking, only Europeans with salaries on
the scale £480-20-£600 and higher are now pensionable. There would be no injustice in laying down that from a fixed date, while all the existing holders of pensionable posts would retain their pension rights, these privileges would not be extended to anyone promoted or appointed in future to these posts. Those who are already in the service and hope to be promoted to these posts would not be injured, because there is no obligation on the Administration to maintain the pay and privileges of a post in the interests of anyone in the service who may have hopes ultimately of attaining that position.

106. It was represented to me that the travelling allowance of the Heads of Railway Departments should be raised from 8/- to 12/- a day to bring it on a level with that drawn by the Heads of some Government Departments and Provincial Commissioners, who are in certain cases on lower salaries, and also to bring it into line with that drawn by the Heads of Departments on the Kenya & Uganda Railways. From the enquiries I made I satisfied myself that on the basis of 8/- a day the Head of a Railway Department is not out of pocket by reason of his having to travel. That to my mind is the proper test and I regret therefore that I cannot recommend an increase which depends solely for its justification on the allowance given in other services.

107. The leave granted to European officials returning to the Territory for duty is 6 days for every month of service in the Territory plus the time taken on the journey to and from England. Taking 2 1/2 years as the usual tour, the official thus gets for every 30 months he spends in the Territory 8 months leave in all, of which 6 are spent in England. It has been decided on medical grounds that this amount of leave is necessary, and with that decision or the wisdom of it I have no wish to dispute. On the contrary on general grounds I think it is a wise policy to grant generous leave terms in a tropical country. But I would submit that it is not an essential part of that decision that in the normal case these officials should be expected to do no work during the whole of the 8 months. The main reason for this length of leave is that it is necessary for them to stay in a temperate climate for a certain period in order to recover from the effects of the tropics, but, while it is necessary that they should be freed from the cares of work for a portion of the time, it does not appear essential that they should remain idle for more than a fifth of their whole service. Actually in the case of senior officers they are called upon to do a good deal of work whilst they are at home on leave, such as conferring with the Crown Agents on technical matters and inspecting candidates for appointment. Also many of the junior officers take advantage of this stay at home to keep ahead of the latest developments in their professions. But the generosity of the leave terms in itself gives the Railways the right to demand that all of its officials and not merely a few should devote some of their time on leave to the Railways’ service, and I include in that term the duty of keeping up to date in their professions.
I therefore recommend that all officials should be compelled to devote one-fifth of the period of leave spent in England to professional work, unless exempted by medical certificate. It is not necessary in this Report to specify the various forms of professional work open to them, but it will be sufficient to say that, apart from work to be done on behalf of the Railways themselves such as the inspection of rolling stock, the British Railways are most courteous in the facilities which they offer to Colonial railway officers to inspect their working and the methods adopted in all branches. In the case of Marine officers, courses for Royal Naval Reserve Officers and Trinity House courses could be taken as equivalent. In every case the official should submit a report on his return on what he has seen or studied and travelling allowances should be paid, which could be withheld at the discretion of the General Manager, if it was clear that the prescribed time had not been spent in a reasonable or satisfactory manner.

108. Another staff question which I have pleaded before without success but, nevertheless, feel is of sufficient importance to raise again, is the need for a freer exchange of officials amongst Colonial railways. There has, more especially of recent years, been a fairly free flow of senior officials between the various railways, but hitherto it has not been extended to any degree to the junior posts. Usually the vacancies in district ranks are filled from the assistants on that railway so that each is practically a water-tight compartment up to district rank. I think that there would be a gain in efficiency if there was a more general range of selection to district rank. Each railway has in every department its own individual problems and difficulties and these are usually tackled in its own particular way. The smaller the railway and the smaller its business, the greater is this tendency. If officers are transferred to other railways on promotion to district rank, they not only are confronted with new problems but they meet new methods of tackling the old ones. The man who is transferred cannot fail to gain in efficiency by the change of outlook and the new range of problems with which he is faced. The objections which will be raised are those of language and knowledge of local conditions. A man who has only just been promoted to district rank should not be too old to acquire a sufficiently good knowledge of a new language for the practical purposes of his work, and knowledge of local conditions should not be allowed to weigh in the balance against the greater experience and efficiency which would be thus obtained.

I would recommend that when any vacancy in district rank occurs the terms and conditions should be circulated to all Colonial railways and applications should be invited. These should be supported by the recommendation of the applicant’s General Manager and a certificate from the latter that he would be prepared to accept the applicant as a district officer on his own railway. These could be then forwarded to the General Manager of the railway on which the vacancy exists for his recommendation, the final decision being left in the hands
of the Colonial Office. This procedure might entail delay in making the appointment but to my mind this is surely of less importance than having a system which affords a better training and experience to the individual.

CHAPTER XIII. – MANAGEMENT AND GENERAL QUESTIONS.

109. As mentioned earlier in Chapter IX, Accounts Department, I have submitted a special Report recommending the separation of the General Manager’s and Chief Accountant’s Offices. In the same Report I have recommended the appointment of a Deputy General Manager.

110. Prior to my arrival in the Territory it had been recognised both by the Government and by the Railway Administration that it was necessary to enlarge the powers delegated to the General Manager. A new set of proposed powers had been prepared and I examined these in detail with the General Manager. As a consequence the draft was amended considerably and a new one was prepared. In forwarding these proposed powers to His Excellency the Governor I recommended their adoption on the grounds that they were such as should properly be granted to the General Manager of a system such as the Tanganyika Railways in the interests of efficiency and discipline and pointed out that they did not exceed those now delegated to the General Manager of the Kenya & Uganda Railways. The latter powers, in fact, formed the basis of the new proposed powers for the General Manager of the Tanganyika Railways, due allowance being made for the difference in the constitution of the controlling authority in the two cases,

111. The situation regarding lands occupied by the Railways requires to be placed on a proper footing. At present these lands are administered by the Land Department; they are treated in the same way as the lands occupied by other Government departments, and the Railway Administration has little or no control over them. This is incorrect, if the announced intention of running the Railways as a business concern is to be maintained. These lands constitute an important asset and, so long as the Railways have no control over their assets, it is impossible to regard them as being run on business lines nor to regard their accounts as being separated from those of the Territory.

The first step to be taken is to decide what are precisely Railway lands. The fairest course would be to decide that these were all lands in active occupation by the previous German Railway Administration, such as the land occupied by the running road, stations, workshops, and all buildings occupied by that Administration. The same principle could be applied as regards the Allied Services. The Railways should pay for any land acquired since at the current rate at the time taken over and, per contra, the Government should pay the Railways for any
Railway lands or buildings, as defined above, which they have taken over since, such as the Railway Hotel at Kigoma now used as a Resident’s house.

There is a further justification for this as the cost of acquiring the Railways from the Custodian of Enemy Property was borne by the Railways and not by the Government.

When new lines are constructed now, the practice is for the Railways to pay only for disturbance when they run through alienated land. If the land is freehold, the Government gives the owner land elsewhere in compensation; if it is leasehold, the lease paid to the Government is reduced proportionately. These costs should be borne by the Railways and not by the Government.

I would recommend however that, even where the land has been alienated, that required for the running road should be expropriated without payment, but compensation should be paid for any disturbance to crops and buildings. For the extra land required for station sites or sidings or for any land in township areas full payment should be made. /

This principle is by no means uncommon in lands awaiting development and does not bear harshly on the people whose land is expropriated. The land occupied by the running road is a narrow strip and the value of the remainder of the property, whether freehold or leasehold, is increased out of all proportion owing to the presence of the railway.

There would be no difficulty in the Railways administering the lands. The Engineering Department, as on many railways, would hold the deeds and carry out the little amount of administration required and it should be able to do that without any increase in staff or cost.

112. The Railways pay for all services rendered by Government Departments such as Legal, Medical, Police, Post Office, Lands and Transport, and on the other hand Government Departments pay the ordinary passenger and goods rates. I am in entire agreement with this principle of paying in full for all services rendered on both sides as without it the declared intention of running the Railways on business lines degenerates into a pretence.

113. I have already related in Chapter XI, on Goods Service and Rates the extent to which rates on the Kenya & Uganda and Tanganyika Railways have been assimilated in accordance with the recommendation of the Commission on Closer Union. Thanks to the close co-operation between the two General Managers, good progress is being made with the standardisation of rules and regulations and equipment.

The most difficult question in regard to equipment is that of braking, as the Kenya & Uganda Railways use the Westinghouse and the Tanganyika Railways the Vacuum brake, which is further complicated by the possibility of the Tanga line being worked by the Kenya & Uganda Railways. The two General Managers have rightly decided that, before any decision can be taken on this important
question, the cost of conversion of either of the two systems should be ascertained, and a joint committee is being appointed to investigate all aspects of the question including cost.

114. One portion of this question of standardisation which has a wider application is that of weights and measures. At present the Tanganyika Railways use the metric system which they inherited from the German Administration. It was represented to me by public bodies that the use of metric weights handicapped them in trade dealings. In my previous Report I recommended the retention of the metric system because at that time no representations were made to me as regards the effect on trade and the financial situation did not justify expenditure on a change which was not being demanded by the trading community. Both these conditions have now been altered and, when in addition the advantages of standardisation are put forward, I think a strong case is made out for the allocation of the £12,000 which the General Manager has asked for in order to introduce British weights and measures.

115. The Annual Report for 1928/29, which has just appeared, is an improvement on its predecessors in so far as the separate reports from every departmental head are replaced by a single report signed by the General Manager, but it still remains in my opinion a most inadequate document. The ten rather meagre pages of which the Report consists, composed largely of several bald though necessary tables, compares most unfavourably with those of any of the other African Railways, such as the South African, the Rhodesian, the Nigerian, the Kenya & Uganda or, even / to go further afield, the ‘Iraq Railways, especially when it is remembered that these pages also chronicle the doings and results of the various Allied Services, the Harbours and Wharves, the Marine, the Dockyard and the Electricity Department. Brevity may be an excellent quality, but it is surely out of place in an annual report to carry it to excess. For instance, the only comment on the railway revenues from public goods traffic, the largest source of income of the system and, it is no exaggeration to say, the main reason of its existence, is ‘On the Central Railway the tonnage of groundnuts and grains fell short of expectation, but cotton showed a considerable increase. The Territory is progressing rapidly, and imports and exports must increase.’ Then follow the tables for the various commodities, which in the case of exports show tonnage but not revenue. Only one page and a quarter is devoted to what is the most important factor to a railway, its receipts, and two-thirds of this is devoted to tables.

A new method of crediting receipts in the Marine Department was adopted in 1928/29, as a consequence of which it showed a loss of £5,719 on Revenue Account for that year as against a profit of £5,525 in the year preceding, and its receipts dropped from £40,349 to £25,050. No explanation whatever is vouchsafed in the Report as to the reason for this; it is not even mentioned and in the
normal way it would be assumed, quite incorrectly, that it was due to loss of business, although even then it would be worth mentioning.

The Annual Report is the only opportunity which the General Manager has, apart from his speech on the Railway Estimates at the Legislative Council, of giving an account of his stewardship. The Railways are the property of the Territory and, quite apart from the fact that it is entitled to full knowledge, it is to the General Manager’s interest to give it reasoned explanations of what has occurred and of what it is hoped to do in the future. If all that the public receives is some statistics, linked with a few bare statements, criticism is bound to arise.

The arrangements of the accounts, tables and statistics also is by no means satisfactory, statements of numbers of passengers and tonnage of goods carried and train and engine mileage being sandwiched between statements relating to accounts. I do not propose to make any recommendation as to the actual statistics which should be presented nor as to the form in which they should be prepared, as this has been the subject of investigation and report by a Committee whose recommendations have been circulated to the various railways and are now under consideration. /

CHAPTER XIV. – FINANCE.

116. The accounts of the Tanganyika Railways are in theory divorced from those of the Territory, but in practice the separation is not complete because some of the assets of the Railways, such as unallocated stores, cash balances and advance accounts, still figure in the accounts of the Territory. Also the actual cash receipts and expenditure appear in the Territory’s accounts whereas the only figure which should appear there is the net balance, whether credit or debit, as arrived at on a commercial and not a Treasury cash basis, after all obligations have been taken to account. Certain points, too, are at issue between the two parties. For both reasons the Railways’ Accounts cannot yet be presented in proper commercial form.

The principal accounts at present consist of Revenue and Expenditure Accounts for each line, the Central, Tanga and Lindi, and for each Allied Service; a Capital Account, a Deficiency Account and a General Account, the last three being common to the whole undertaking. The balances of the various Revenue Accounts are carried to the Deficiency Account, which shows the total deficiency in working since the undertaking began. The Capital Account shows in the ordinary form capital receipts and expenditure. The balances of these accounts are carried to the General Account in which, in addition to the ordinary entries for value of cash and stores on hand and balances of advance and deposit accounts, are also included items representing free grants and loans for deficiency in working. In Tables F/1 and F/2 are given the Capital and General Accounts for the year 1928/29.
TABLE F/1.
TANAGANYKA RAILWAYS – CAPITAL ACCOUNT, 1928/29.

<table>
<thead>
<tr>
<th>Dr.</th>
<th>Expenditure.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1919/20</td>
<td></td>
<td>£16,351</td>
</tr>
<tr>
<td>1920/21</td>
<td></td>
<td>49,356</td>
</tr>
<tr>
<td>1921/22</td>
<td></td>
<td>119,668</td>
</tr>
<tr>
<td>1922/23</td>
<td></td>
<td>33,618</td>
</tr>
<tr>
<td>1923/24</td>
<td></td>
<td>284,935</td>
</tr>
<tr>
<td>1924/25</td>
<td></td>
<td>135,287</td>
</tr>
<tr>
<td>1925/26</td>
<td></td>
<td>380,276</td>
</tr>
<tr>
<td>1926/27</td>
<td></td>
<td>536,638</td>
</tr>
<tr>
<td>1927/28</td>
<td></td>
<td>866,751</td>
</tr>
<tr>
<td>1928/29</td>
<td></td>
<td>380,223</td>
</tr>
<tr>
<td>Adjustment of items previously appearing in Treasury Books</td>
<td></td>
<td>198,176</td>
</tr>
<tr>
<td>Balance available</td>
<td></td>
<td>3,001,279</td>
</tr>
<tr>
<td><strong>Receipts.</strong></td>
<td></td>
<td><strong>£3,312,676</strong></td>
</tr>
<tr>
<td>By Free Grants, 1919/20 – 1920/21</td>
<td></td>
<td>126,462</td>
</tr>
<tr>
<td>By Exchequer Loan</td>
<td></td>
<td>1,337,101</td>
</tr>
<tr>
<td>By Guaranteed Loan</td>
<td></td>
<td>1,811,100</td>
</tr>
<tr>
<td>By Transfer from Revenue Account</td>
<td></td>
<td>38,013</td>
</tr>
</tbody>
</table>

TABLE F/2.
TANAGNYKA RAILWAYS – GENERAL ACCOUNT as at MARCH 31st, 1929.

<table>
<thead>
<tr>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficiency Account</td>
</tr>
<tr>
<td>Credits due but not received</td>
</tr>
<tr>
<td>Earnings due but not received</td>
</tr>
<tr>
<td>Advance Accounts</td>
</tr>
<tr>
<td>Value of Unallocated Stores on hand</td>
</tr>
<tr>
<td>Cash with the Crown Agents</td>
</tr>
<tr>
<td>Cash on hand and Bank</td>
</tr>
<tr>
<td><strong>£1,277,091</strong></td>
</tr>
<tr>
<td>Balance at Credit of Capital Account</td>
</tr>
<tr>
<td>Free grant for deficiency on working</td>
</tr>
<tr>
<td>Exchequer Loan for deficiency in working</td>
</tr>
<tr>
<td>Advance from the Treasury</td>
</tr>
<tr>
<td>Payments due but not made</td>
</tr>
<tr>
<td>Deposit Accounts</td>
</tr>
<tr>
<td><strong>£1,277,091</strong></td>
</tr>
</tbody>
</table>
Before discussing the form of accounts which should be adopted I think it will be advisable to deal with the points now at issue. When decisions have been given on these points, the way will be clear to complete the divorce between the accounts of the Territory and of the Railways, and to start the latter on full commercial lines without the danger of having to make important alterations subsequently.

117. The first point concerns the amount which should be included in the Capital Account of the Railways to represent the sum paid for the acquisition of the Central line. The High Court valuation in January, 1925, in connection with the purchase of the Central line from the Custodian of Enemy Property amounted to £614,000. The Tanganyika Government received £580,006 in respect of the interest of the German Government in the Railway. The sum therefore actually paid over by the Territory to acquire the Railway was £33,994. As the Tanga line was entirely Government-owned, nothing had to be paid to acquire it. The sum of £33,994 was in turn credited by the Railway Administration to the Tanganyika Treasury. It has been claimed that the figure which should be entered in the Railways’ Capital Account should be the High Court valuation of £614,000, and not the actual sum paid, £33,994.

With this view I cannot agree. If the Territory had paid anything by way of War contribution to acquire the interest of the German Government, the case might be arguable, but it has not done so. If the course proposed was adopted, it would mean that the Territory was making £580,006 out of a business deal with one of its own commercial concerns and forcing that concern to insert an inflated figure in its accounts to justify the transaction. The Territory would, in fact, be floating a concern at nearly twenty times the sum it paid for it, which is hardly the function of a Colonial or Mandated Government.

It is only right, too, that the users of the Railway should obtain some of the benefit of the low purchase price; the whole should not accrue solely to the Government. Moreover, the Railways have up to date made no provision for renewals; in addition to the annual contribution for this purpose, they will have to make good, so far as their future resources permit, the arrears of renewals and past deficiencies in working. To inflict on them in addition an enhanced capital value would be most unfair.

This purchase money of £33,994 has been credited to the Treasury by transfer out of Revenue Account. It is certainly unusual to pay the first cost of a railway out of current revenue, but the whole circumstances of the transaction were exceptional and such a procedure, though unusual, cannot, I think, be called irregular.

118. The Capital Account for 1928/29 was amended by the Chief Accountant at my suggestion and is presented in the annual accounts for 1928/29 in the form above as agreed to between us. In one minor point, which unfortunately
escaped my attention at the time, I think it requires alteration. The heading 'By transfer from Revenue Account – £38,013' includes other small items of capital expenditure from Revenue as well as the sum of £33,994 for purchase. I think this item should be given separately in order to show clearly what the transaction was.

119. The first item on the Creditor side of the Capital Account, 'By Free Grants 1919/20 – 1920/21 – £126,462' is also under dispute. With this is allied the question of the deficits of those years. These items may be summarised as follows:

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Expenditure 1919/20</td>
<td>16,351</td>
</tr>
<tr>
<td>Capital Expenditure 1920/21</td>
<td>49,356</td>
</tr>
<tr>
<td>Tools and Plant 1923/24</td>
<td>60,755</td>
</tr>
<tr>
<td>Capital Expenditure</td>
<td>126,462</td>
</tr>
<tr>
<td>Deficit 1919/20</td>
<td>158,462</td>
</tr>
<tr>
<td>Deficit 1920/21</td>
<td>193,234</td>
</tr>
<tr>
<td>Deficits</td>
<td>351,696</td>
</tr>
<tr>
<td>Total</td>
<td>£478,158</td>
</tr>
</tbody>
</table>

The Lords of the Treasury agreed that the Exchequer grants in aid Tanganyika for the period to 31st March, 1921, were not to be regarded as repayable in due course, vide their letter S. 14,781 of 23rd May, 1922. The free grants in aid thus received were:

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920/21</td>
<td>316,000</td>
</tr>
<tr>
<td>1921/22</td>
<td>92,109</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>£408,109</strong></td>
</tr>
</tbody>
</table>

Owing to the system of book-keeping then in force in the Territory certain items of expenditure proper to the year 1920/21 were not actually paid until much later and therefore failed to benefit by the free grants in aid given by the Imperial Treasury to cover the deficits of the Territory for that year. These sums were as follows:

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>King's African Rifles Commitment</td>
<td>36,508</td>
</tr>
<tr>
<td>Paid in 1921/22</td>
<td>218,223</td>
</tr>
<tr>
<td>Paid in 1922/23</td>
<td><strong>£254,731</strong></td>
</tr>
</tbody>
</table>

Finally there was a special item of Railway Tools and Plant, £60,755, which was not paid until 1923/24, but which the Lords of the Treasury, also in their letter S. 14,781 of 23rd May, 1922, agreed should be treated as not repayable.

The Acting Governor's despatch 808 of 6th November, 1922, asked for a grant in aid in 1923/24 to cover this, but as it does not figure in the summary of
free grants in aid given in the Governors despatch 771 of 2nd August, 1929, it was not apparently obtained or was merely a loan in aid and not a grant.

Why this should have been so I have been unable to gather from the files of the Local Secretariat, because the promise of the Lords of the Treasury to give a free grant in aid for this purpose is quite clear.

The Tanganyika Treasury now presents the case in the following way. Free grants in aid amounting to £408,109 have been obtained from the Imperial Treasury. These have been allocated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>King’s African Rifles Commitment as above</td>
<td>254,731</td>
</tr>
<tr>
<td>Railway Tools and Plant</td>
<td>60,755</td>
</tr>
<tr>
<td></td>
<td>£315,486</td>
</tr>
</tbody>
</table>

leaving a balance of £92,623, which can be applied towards the Railway deficits of the years 1919/20 and 1920/21.

The Railways protest against this; their defence may be represented thus. The free grants in aid were made by the Lords of the Treasury to cover the expenses of the Territory as a whole without discrimination between the Territory and the Railways, and by their specific references to the Railways they made clear their intention that the Railways should be free of any debt for the years 1919/20 and 1920/21. The Treasury of the Territory had certain commitments for those years which, owing to the system of book-keeping, were not included in the accounts for the appropriate year. It is wrong that, as a result of this system for which the Railways are in no way responsible and which has since been changed, sums originally intended for the Railways should be re-allocated, that the whole resulting burden should be placed on the Railways and that the Territory should get off scot-free. Further, they can plead that the promise of the Lords of the Treasury to provide a further grant in aid in 1923/24 of £60,755 on account of Tools and Plant has never been implemented. The fault for this may lie with the Tanganyika Treasury; it certainly does not lie with the Railways. Yet the consequences of this failure the Tanganyika Treasury now wish to place entirely on the Railways.

If the Government of the Territory insists on its pound of flesh, it is no doubt entitled to it on the grounds that, although the Lords of the Treasury may have mentioned the Railways in their letter, the grants in aid were made primarily to relieve the Territory of its deficits, irrespective of the departments from which they accrued, and that, as the Railways are a subsidiary undertaking of the Territory, any question of re-allocation of funds is one between it and the Imperial Treasury and not between it and the Railways. But such an attitude can hardly, I think, be described as a generous one, because it leaves the whole of the deficit to fall on the Railways.
It has been proposed that the matter might be referred to the Lords of the Treasury for a statement as to whether they intended that these grants in aid were given for the specific purpose of relieving the Railways of their deficits and capital expenditure for the years 1919/20 and 1920/21 or not. I understand that His Excellency the Governor is agreeable to this being done and I would suggest that reference should be made accordingly.

If this course is adopted, I think that, if my reading of the case is right, it might be represented to the Lords of the Treasury that their promise to make a grant in aid in 1923/24 to cover the cost of Railway Tools and Plant has not yet been fulfilled, and a special plea made for its redemption.

120. If the Lords of the Treasury decline to give a pronouncement as to their intention in making the grants in aid or to make good the promise of a further grant in aid of £60,755, I suggest the following compromise:

<table>
<thead>
<tr>
<th>£</th>
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<tbody>
<tr>
<td>The grants in aid total 408,109</td>
</tr>
<tr>
<td>The Railway Tools and Plant item has been specifically mentioned as to be covered by a grant in aid and therefore has the first right to relief 60,755</td>
</tr>
<tr>
<td>Leaving a balance of £347,354</td>
</tr>
<tr>
<td>The Railway deficits and capital expenditure for the years 1919/20 and 1920/21 amount to £417,403</td>
</tr>
<tr>
<td>And the uncovered commitments of the Territory for the same years i.e., those relating to the King’s African Rifles, amount to 254,731</td>
</tr>
</tbody>
</table>

I suggest that the balance of the grants in aid, £347,354, should be divided up in that proportion. The grants in aid would then be allocated as follows:

<table>
<thead>
<tr>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special King’s African Rifles expenditure 131,638</td>
</tr>
<tr>
<td>Railway Tools and Plant 60,755</td>
</tr>
<tr>
<td>Balance towards Railway deficit and capital expenditure 215,716</td>
</tr>
</tbody>
</table>

This balance of £215,716 should be applied to the deficiency in working rather than to capital. Reason for this is that any free grant, unless specifically allocated as in the case of ‘Railway Tools and Plant,’ should, on principle, be used to wipe out deficits rather than as a capital receipt.

The item in the Capital Account, ‘By Free Grants 1919/20 – 1920/21 – £126,462’, would then be altered to read ‘By Free Grant, Railway Tools and Plant – £60,755’ and ‘By Advance from Tanganyika Treasury – £65,707’, the latter figure being the total of the capital expenditure for those two years. The figure in the General Account, ‘Free Grant for Deficiency in Working – £351,696’, would
be altered to £215,716, and a new item would appear ‘Advance form Tanganyika Treasury to cover Deficiency in working – £135,980.’

121. Another item which requires settlement is that relating to the cash advanced free of interest to the Railways from the Tanganyika Treasury prior to 31st March, 1927. Since then, under a ruling of the / Secretary of State, interest has been charged on sums advanced. The figure outstanding at that date was £151,417 made up as follows:–

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unallocated Stores, Railways</td>
<td>£163,296</td>
</tr>
<tr>
<td>Advance Accounts</td>
<td>£6,179</td>
</tr>
<tr>
<td>Cash Balance</td>
<td>£43,101</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Less Deposit Accounts, Railways</strong></td>
<td><strong>£151,417</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Tanganyika Treasury claims that this sum should, in the event of the Railways becoming an organisation separate from the Government of Tanganyika, be considered as a loan repayable to that Government. I understand that the Railway Administration does not now dispute this; in fact, an appropriate entry already exists in the General Account. I agree with this view; the question of payment of interest on these advances from the Treasury will be discussed later.

122. There are two further outstanding items which have been met by the Treasury out of the General Revenue of the Territory and do not figure in the Railways’ Accounts. These are:–

1. Interest on Exchequer Loan for the years 1921/22 and 1922/23, £17,237;
2. Interest and Sinking Found charges on Ports and Harbours Capital Expenditure from 1st November, 1925, to 31st March, 1928, £10,070.

The Railway acknowledge indebtedness in both cases, but up to date neither figures in their accounts. In the first case the Treasury recommends that the Railway surpluses in the years 1926/27 and 1927/28 should be applied to reducing the sums due to General Revenue. I think the sounder financial policy would be to use these surpluses for the reduction of the arrears of renewals and allow the sums due to General Revenue to be added to those shown in the General Account under ‘Advances from treasury.’

In the second case the Treasury recommends that the sum of £10,070 should be taken from future surpluses on the Port, Harbours and Wharves Revenue Account and credited to the General Revenue of the country. I think the case here is even stronger than in the former instance to add this to ‘Advances from Treasury’, and apply future surpluses to reduction of arrears of renewals.

123. If my recommendations on these points are accepted and the Lords of the Treasury give a pronouncement in favour of the Railways, the Capital...
Account will appear in the same form as to-day, except for the small alteration necessary to separate the acquisition money for the Railways from the remainder of the sums transferred from Revenue Account. The only alteration in the General Account will be the addition of £17,237 plus £10,070 – £27,307 to the heading ‘Advances from Treasury’.

On the other hand, if a pronouncement is not given and a compromise is made on the lines I have suggested, a new heading ‘Advances from Tanganyika Treasury’ will appear in the Capital Account and a new heading ‘Advance from Tanganyika Treasury to cover deficiency in working in the General Account. I propose that the latter should be maintained as a separate heading from the ordinary one’ Advances from Treasury’ as it will be a large item and the money will have been advanced for a specific purpose. /

I consider that these advances should be considered as loans and, as such, the Territory is undoubtedly entitled to interest on them. The Railways, however, in the future will have not only to make current provision for renewals but also, so far as their resources permit, for arrears of renewals. I think any available surpluses should be applied first to making good these arrears of renewals, and that only when these arrears have been wiped off should the Railways start to pay interest on the advances. I am recommending that the Territory should waive its right temporarily to interest on these earlier advances because I think it is to its advantage as well as the Railways’ that the latter should be strengthened financially. If the Railways become part of an organisation separate from the Government of the Territory, I consider that the advances should be treated as ordinary loans and either be repaid or have interest paid on them.

I would point out that this recommendation should apply only to these special advances and on cash advanced prior to 31st March, 1927. If the Territory consents to this and to my earlier recommendation to let the Railways add some of the outstanding debts to the ‘Advances by Treasury’ instead of insisting on repayment from surpluses, it will be rendering as much assistance to the Railways’ finances as can be expected and it is only right that the Railways should pay interest on advances made after that date.

I have referred already to the necessity for making annual provision for renewals. I do not propose to explain, as I have in earlier reports on other railways, the reason for this as it is now an accepted principle in Colonial railway practice. The Tanganyika Railway Administration also recognises the need, but its net revenue has until recently been too small to allow it to do so.

As the Railways have now shown a gradually increasing balance on revenue account for the past three years and this increase shows a reasonable indication of continuing, I think the time has come to institute a proper Renewals Fund, and with this view the General Manager agrees. At my request the Railways prepared lists of all wasting assets, giving, in the case of assets which were new when
acquired, the date when acquired, the estimated life and the cost of replacement at present prices; and, in the case of assets which were not new when acquired, the date when acquired, the estimated remaining life at that date and the cost of replacing the asset at present prices in the same state as it was when acquired. From these lists tables were prepared showing the total replacement costs of the various classes of assets, the annual contributions which should be made to the Renewals Fund in order to build up the replacement costs within the estimated lives of the assets, and the arrears of renewals which would be outstanding on the assumption that annual contributions started on 1st April, 1930. The summaries of these results are given in Tables F/3 and F/4; the first is for Railway assets only; the second for the assets of the Allied Services, excluding the Electricity Department. In the case of Railway assets which were new when acquired, the lives have been assessed for the various classes of assets by agreement between the Railway Administration and myself, and in the case of assets which were used when acquired the Railways have themselves assessed the life remaining to the asset at the time it was acquired. I am satisfied that the lives in the latter case have not been under-estimated. For example, the original German rails on the Central line which are of very fine quality steel have been given a life of 42 years from the date of acquisition, which is equivalent to a total life of 50 years. In the case of the Allied Services, the lives of nearly all the more important assets had to be assessed individually. /

<table>
<thead>
<tr>
<th>Head</th>
<th>Yearly percentage for Renewal</th>
<th>Total replacement costs</th>
<th>Annual contribution to placement as in previous column</th>
<th>Arrears of Renewal to March 31st, 19340</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets New when Acquired:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engines</td>
<td>4</td>
<td>157,600</td>
<td>6,304</td>
<td>20,616</td>
</tr>
<tr>
<td>Rolling Stock</td>
<td>4</td>
<td>337,590</td>
<td>13,503</td>
<td>45,720</td>
</tr>
<tr>
<td>Machinery</td>
<td>6 2/3</td>
<td>35,516</td>
<td>2,250</td>
<td>7,469</td>
</tr>
<tr>
<td>Permanent Way Materials</td>
<td>3</td>
<td>764,200</td>
<td>22,926</td>
<td>60,922</td>
</tr>
<tr>
<td>Buildings</td>
<td>1 1/2</td>
<td>264,000</td>
<td>1,320</td>
<td>16,929</td>
</tr>
<tr>
<td>Watering Stations</td>
<td>4</td>
<td>51,000</td>
<td>2,040</td>
<td>3,680</td>
</tr>
<tr>
<td>Turntables and Weigh-bridges</td>
<td>4</td>
<td>7,000</td>
<td>280</td>
<td>160</td>
</tr>
<tr>
<td>Bridges and Culverts:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) Steelwork</td>
<td>3</td>
<td>38,000</td>
<td>1,140</td>
<td>1,033</td>
</tr>
</tbody>
</table>


(2) Masonry and Concrete

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
<th>Annual Contributions</th>
<th>Arrears</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1,874,906</td>
<td>53,063</td>
<td>161,226</td>
</tr>
<tr>
<td>Engines</td>
<td>97,828</td>
<td>6,764</td>
<td>74,424</td>
</tr>
<tr>
<td>Rolling Stock</td>
<td>212,020</td>
<td>14,696</td>
<td>160,444</td>
</tr>
<tr>
<td>Machinery</td>
<td>44,794</td>
<td>2,604</td>
<td>28,559</td>
</tr>
<tr>
<td>Permanent Way Materials</td>
<td>2,017,375</td>
<td>49,137</td>
<td>537,787</td>
</tr>
<tr>
<td>Buildings</td>
<td>412,078</td>
<td>8,219</td>
<td>90,415</td>
</tr>
<tr>
<td>Watering Stations</td>
<td>53,548</td>
<td>3,571</td>
<td>39,268</td>
</tr>
<tr>
<td>Turntables and Weigh-bridges</td>
<td>10,800</td>
<td>780</td>
<td>8,400</td>
</tr>
<tr>
<td>Bridges and Culverts:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) Steelwork</td>
<td>86,182</td>
<td>3,818</td>
<td>42,000</td>
</tr>
<tr>
<td>(2) Masonry and Concrete</td>
<td>640,702</td>
<td>11,558</td>
<td>127,112</td>
</tr>
<tr>
<td>Total</td>
<td>3,575,327</td>
<td>101,147</td>
<td>1,108,409</td>
</tr>
<tr>
<td>GRAND TOTAL</td>
<td>5,450,233</td>
<td>154,210</td>
<td>1,269,635</td>
</tr>
</tbody>
</table>

**Note.** – Replacement costs of used assets as shown in Column (b) are calculated upon estimated life of each asset when acquired. / [...]

Proper renewals registers should be started showing the various assets with full details as to lives, replacement costs, annual contributions and arrears. These details have already been prepared and I understand the General Manager has given orders for these registers to be compiled with a view to starting provision as from 1st April, 1930. A Renewals Fund Account should then be started showing the contributions to the Fund and the withdrawals from it. An ‘Arrears of Renewals Account’ should also be started showing the arrears as on 1st April, 1930, any future additions, and any contributions from surplus revenues in reduction.

Whenever a wasting asset is scrapped or worn out, the total cost of replacing it should be charged to the Fund, irrespective of whether there are arrears against that asset or not. Otherwise part of the replacement cost will be borne by capital and not by revenue. The entry in the ‘Arrears of Renewals Account’ will still be maintained so that the sum may be made good to the Renewals Fund as soon as Railway net revenues permit.

125. From the Renewals Fund will be drawn the contributions to Sinking Fund as it would be incorrect to redeem out of revenue at one and the same time both the assets and the capital with which the assets have been bought.

The tables above show that the annual contribution should be for Railways alone £154,210 and for Allied Services £13,650, making a total of £167,860. The Sinking Fund payments for 1929/30 will be £12,890. Assuming a round fig-
ure for Sinking Fund payments for 1930/31 of £15,000 and deducting this from the total contributions of £167,860 leaves £152,860. As against this the balance on the combined Revenue Account of the whole undertaking for 1928/29 is £122,692. It is hoped that the increase in net revenue for the year 1930/31 will be sufficient to make good this gap of £30,000, but, if not, any short fall in the provision will have to be added to the arrears of renewals.

These will, by 1st April, 1930, amount to £1,309,076; deducting therefrom the Sinking Fund payments made in the years 1927/28, 1928/29 and 1929/30, which, on the same principle as above, should be debited to the Renewals Fund, a final figure of £1,271,119 on account of arrears of renewals is reached. This heavy liability emphasises my plea that the Territory should treat the Railways generously and allow the surplus balances of the years 1926/27 and 1927/28 to be applied to the reduction of arrears instead of being credited to the General Revenue of the Territory and also to waive interest temporarily on this and the other earlier advances.

126. The question of the form in which the Railways’ accounts should be presented remains. At present, besides separate revenue accounts for each railway line, Central, Tanga and Lindi, there are separate revenue accounts for the Lake Steamer Service, the Marine Department, the Wharves, the Dockyard, and the Electricity Department.

The Marine Department Account includes only the expenditure on harbour and lighting services and on the S.S. ‘Azania’ and the receipts from port and light dues, pilotage fees and receipts from the S.S. ‘Azania’.

The revenue and expenditure of the Lake Steamer Service are kept in a separate account.

The Wharves Account contains the wharfage and cranage receipts and customs shed rents from Dar-es-Salaam, Tanga and Mwanza, and expenditure in connection with these wharves.

The System pays for all services received from Government Departments, such as medical and legal, and the cost of all miscellaneous services of this nature as well as of management, supervision and Provident Fund is divided up between each account in proportion.

Finally the appropriate capital charges are debited against each account. The object of this division is in order to be able to keep a clear idea of how each service is doing; also, if at any time it is decided to take away from the undertaking any particular service, the accounts can be disentangled without difficulty. With this I entirely agree. The only amendments which I propose are that the renewals contributions should be entered as ordinary expenditure in the Revenue Accounts.
The balances of these Revenue Accounts should be applied to the reduction of the item ‘Arrears of Renewals’ in the Balance Sheet, until these have been wiped out.

At present only one Capital Account is maintained for the whole undertaking. Funds for capital expenditure, apart from free grants and the relatively small transfer from Revenue Account mentioned above, have been provided by a 5 per cent. Exchequer Loan of £1,337,101, and from that proportion of the proceeds of the Tanganyika 4 1/2 per cent. 1948/68 Guaranteed Stock which was allocated to the Railways. On the former, capital charges are being paid, as opposed to an Exchequer Loan of £449,505 to cover deficiency in working from the year 1921/22 to the year 1926/27 inclusive. The question of interest payments on the latter and of the terms of repayment will come up for consideration in 1933. It is included in the General but not in the Capital Account. On the Tanganyika 4 1/2 per cent. Stock the Railways pay their share of capital charges and management expenses and bear their share of the reduction of the amount realised from the Loan, due to its being issued at a discount and to expenses of issue.

For the same reason as in the case of the Revenue Accounts, I think separate Capital Accounts should be kept for each service. The interest charges paid for the use of capital are already kept separate and the same division should be maintained for the capital itself. The balances of these accounts should be carried to a combined Capital Account for the whole undertaking, the balance of which in turn should be carried to the Balance Sheet.

The Balance Sheet will take the place of the present General Account and will include the items given therein subject to the amendments to the items in that Account recommended earlier.

Thus on the liability side, if it is decided that the Railways should not receive the whole of the grants in aid, an item will appear ‘Advances from Treasury to cover deficiency in working – £135,980,’ with an equivalent reduction under the heading ‘Free Grants.’ The present item ‘Advances from Treasury’ will be increased by £27,307 to cover the unpaid interest charges owing to the Treasury, and the Deficiency Account increased by a similar amount. / 127. Appropriate entries will also appear on each side of the Balance Sheet to show respectively the balance of the Renewals Fund and the sums held against that balance, and finally there will be an item on the liability side of approximately £1,270,000 to represent ‘Arrears of Renewals.’ This will, of course, have to be supported by a similar increase in the Deficiency Account on the opposite side of the Balance Sheet.

However distasteful it may be to show a large deficiency, it is the only sound financial course. Furthermore, it is only right that the Deficiency Account should be increased by this amount because the failure to make provision in the
past has been due to deficiency in revenue during the eleven years which have elapsed since the present Railway Administration started.

128. The obligation to make good these arrears ranks next to the obligation to meet the service of the loans and, the service of the loans having been met in the various Revenue Accounts, any balance standing to the credit of these accounts should be applied to the reduction of the arrears of renewals. No other charge should be allowed to take priority nor should any attempt to whittle down the annual provision for renewals be permitted.

It may be argued that, with over a million pounds of arrears of renewals to be first wiped out, there is little chance of the Territory receiving interest on its earlier advances for some years to come. This is certainly true, but these arrears of renewals represent not only an important but also an urgent question for the Railways. Practically all its stock and assets are either very new or very old. The latter will soon require replacement. The Renewals Fund is only based on the life remaining to these assets when they were acquired. That portion of the replacement cost represented by the earlier life will have to be paid out of capital. If, in addition, owing to the surplus balances having been taken as interest on advances or to repay the advances themselves, the sums in the Renewals Fund are not large enough to pay for its share of the replacement cost, further moneys will have to be borrowed and a further set back given to the financial prosperity of the Railways.

CHAPTER XV. – FUTURE POLICY AND DEVELOPMENT.

129. In the previous Chapter it has been shown that the Tanganyika Railways system in 1930/31 will just be able to meet its annual provision for renewals, provided its net revenue has by then increased by £30,000 and the Treasury of the Territory consents to waive temporarily the execution of certain of its claims. There will still be an outstanding liability for arrears of renewals of over £1 1/4 millions. While these results will show a marked improvement on those of five or six years ago, it is obvious that the undertaking is not yet in a sound financial condition.

This is clearly not due to heavy capital expenditure and, apart from a recommendation respecting the Tanga line which I shall make later, it is obvious that no large economies in working expenditure can be made.

The real cause lies in the small volume of business handled as compared with the mileage to be maintained. The total revenues from all sources, excluding the Electricity Department, for the year 1928/29 were only £772,134 for a mileage of 1,249.

The following table shows how these figures compare with those of other Colonial railways in Africa:
<table>
<thead>
<tr>
<th>Railway.</th>
<th>Year</th>
<th>Open Mileage</th>
<th>Gross Receipts</th>
<th>Gross Receipts per mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanganyika</td>
<td>1928/29</td>
<td>1,249</td>
<td>£772,134</td>
<td>£618.20</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>1928</td>
<td>338</td>
<td>258,159</td>
<td>763.78</td>
</tr>
<tr>
<td>Nyasaland Railways:–</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trans-Zambesia</td>
<td>1927</td>
<td>331</td>
<td>359,636</td>
<td>1,086.51</td>
</tr>
<tr>
<td>Central Africa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shire Highlands</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nigerian</td>
<td>1928/29</td>
<td>1,625</td>
<td>2,528,107</td>
<td>1,555.76</td>
</tr>
<tr>
<td>Kenya &amp; Uganda</td>
<td>1928</td>
<td>1,393</td>
<td>2,314,430</td>
<td>1,661.47</td>
</tr>
<tr>
<td>Gold Coast</td>
<td>1928/29</td>
<td>500</td>
<td>1,242,947</td>
<td>2,485.89</td>
</tr>
</tbody>
</table>

This table shows clearly the handicap under which the Tanganyika Railways suffer and how necessary it is for them, even more than for the ordinary railway, to increase their gross receipts and to expend capital in doing so.

130. Taking first the Central line, there has already been a notable increase during recent years, coaching and goods receipts for the line having gone up from £333,469 in 1925/26 to £588,284 in 1928/29, an increase of about 75 per cent, in three years. It is true that the Mwanza branch has been added during this period but this only accounts for a fraction of the increase. In fact, owing to bad seasons, the total tonnage carried of groundnuts, which constitute one of the main traffics of this branch, has actually diminished. The other principal exports all show large increases; the tonnage of copper has gone up from 18,817 to 29,997 tons, cotton (ginned, unginned and seed) from 5,652 to 15,226 tons, grains from 8,259 to 15,718 tons, and sisal and sisal tow from 4,404 to 5,052 tons. The variety of the commodities in which these increases have taken place is in itself an excellent augury for further increases in the future. The influence of the increase in exports, both local and transit, is naturally seen in corresponding increases in the tonnage of imports. /  

131. At present the most important traffic on the Central line is that with the Belgian Congo and, as I have explained earlier, special rates are very justly quoted to attract it. The competition for the copper and import trade with the Katanga province of the Belgian Congo will become more acute in the near future when the Lobito Bay line has been completed and the communication with Matadi has been improved. The Katanga – Dar-es-Salaam route suffers from natural disabilities; goods have to be transhipped at four points, and, during low water, traffic on the Lualaba is liable to interruption and is sometimes entirely suspended, as has occurred this year. In face of these factors the General Manager is of opinion that, while the Railways will be able to hold what they now have, they cannot look for any increase. I am inclined to agree with this view.

Fortunately other areas in the Belgian Congo with excellent prospects and situated more closely to Tanganyika Territory are being opened up. At Usum-
bura at the north-east corner of Lake Tanganyika large sisal estates have been started, and between Usumbura and Uvira a large cotton concession has been granted which includes the valley of the Rusisi. At Uvira itself, in the north-west corner of the Lake, a port is now being made and a railway built to connect Lakes Tanganyika and Kivu, as well as a road connection between the principal centres. The provinces of Ruanda and Urundi which will be tapped by these developments are rich and densely populated. To the west of the Lake in the country behind Baraka large mineral developments are reported and further west two or three large cotton concessions have been granted whose normal transport route should be via Baraka. Further south, near the Rhodesian-Congo border, are the copper deposits of Kapulo which it is intended to connect by rail with Moliro on the Lake. As the normal outlet for the whole of this traffic will be via the Central line, there is reasonable justification for expecting a substantial increase in revenue, which will compensate largely for any absence of increase in the traffic with Katanga. I have already referred to the necessity of attracting the traffic by means, if necessary, of special rates. It is equally necessary that the Lake service, the port at Kigoma, and the Central line itself should be equipped to handle it, and that the equipment should be carried out in good time and not lag behind the demand for it. Otherwise the traffic will be discouraged at the outset and very possibly be diverted to other channels from which it will be hard to win it back.

132. [...]  
133. The extension of the port at Kigoma is also of primary importance. I have already pointed out in Chapter VI that the traffic there is rapidly overhauling the means for handling it. The Belgian leased site is already too small for their needs and the British section also requires enlargement. A scheme is, I understand, being prepared by the Consulting Engineers and any decision must await the presentation of their report. Any scheme, too, would have to be carried out in conjunction with the Belgians, who would bear a portion of the cost. Some time must therefore elapse before a decision can be taken, but I would urge that the matter should be pressed forward and funds allocated as soon as a decision has been taken, so that active work can be started without delay, because port works usually take a long time to execute. /

[...]  
134. As regards the other prospects of development on the Central line, the figures quoted above show the increases which have taken place in the last three years in sisal, grains, and cotton. To a person like myself, revisiting the country after eight years, the increase in cultivated land along the railway is striking. The development has obviously not reached its limit by any means; new acreages are being planted and, though the increase may not be so rapid as in the past, there should be a steady progress. The only important commodity which has been dis-
appointing is groundnuts; the tonnage of these, which was 10,845 in 1924/25, fell to 3,853 in 1925/26 and only reached 9,224 in 1928/29. This is attributed partly to a series of bad seasons and partly to the fact that some of the natives in the Mwanza area have turned from groundnuts to cotton. For the latter reason a large increase cannot be expected except at the expense of cotton, but development in agriculture has already taken place amongst the tribes along the main line and, with a steady growth in this and with the return of a few good seasons, it would not be unreasonable to anticipate a moderate increase on the 1924/25 figures.

135. The Tanga line presents a different problem. In 1921 I recommended that the Voi-Kahé section should be maintained and that both it and the short continuation from Kahe to Moshi should be administered by the Uganda Railway, as it then was, that the last 57 miles of track before Kahe is reached should be pulled up and used to relay the light coastal section which was in urgent need of renewal, leaving the Tanga line up as far as Samé to be administered as an isolated section by the Tanganyika Railways, and that Tanga should be regarded as the port only for the zone up to about 150 miles inland, the Moshi and Arusha area having its outlet through Kilindini. This view of Tanga as a subsidiary port was endorsed by the Reports of the Imperial Shipping Committee of 1926 and 1927 on the Harbours of Kilindini and Dar-es-Salaam, in so far as they visualised the diversion of important traffic from the interior of Tanganyika Territory to Kilindini. This has all the stronger application in that when these Reports were made it had already been decided to maintain rail connection between Tanga and Moshi.

I further stated that, if the Kahe-Samé section was not pulled up and physical connection was maintained with the Uganda Railway, it would be preferable to hand over the working of the Tanga line and the port of Tanga to the Uganda Railway. / Tanga line.

It is unfortunate that my recommendations were not adopted. The trade of the Moshi area, and I include therein for this purpose the Arusha area, is insufficient to maintain two railway lines, and its traffic is now divided between them to the detriment of both. The coaching and goods receipts of the Tanga line, including therein those of Moshi, have increased from £45,520 in 1925/26 to £76,965 in 1928/29, or nearly 70 per cent. in three years, which is almost as rapid as the growth on the Central line, despite the fact that the latter has been assisted by the construction of a new feeder line and enjoys a good transit trade. Even with this increase, however, the coaching and goods receipts of the Tanga line only reached in 1928/29 £321 per mile as compared with £583 per mile on the Central line. On the other hand the ordinary working expenditure per mile was slightly higher. In no year up to date have the earnings been large enough to cover the ordinary working expenditure, much less interest charges, which
have so far fortunately been comparatively low. If these are included, the loss on working the line has varied from £30,277 in 1925/26 to £22,095 in 1928/29, the lowest figure which has yet been reached.

If the policy which I advocated had been carried out, this line could not have failed to show much better working results and it would have been spared the expenditure of the greater portion of the £147,000 spent on relaying the coastal section with new track. It is too late now, however, to reverse the policy; both connections will have to be maintained.

Although competition between the two railways is avoided as far as possible by quoting equal rates, competition between the two ports is inevitable and in this competition the smaller port is bound to suffer so long as the larger one takes care not to become congested. The first indications are to be seen in the fact that the Kenya & Uganda Railways handle already the majority of the import trade, which is the more paying, whilst the bulk of the export traffic, which is unre- munerative, goes to Tanga. It is the growth of the latter rather than the former which has entailed the necessity for enlarging the port facilities at Tanga.

136. There is one portion of my original recommendation, however, which can still be carried out, the proposal that the whole Tanga system, port and railway, should be worked by the Kenya & Uganda Railways. This recommendation has since been endorsed by both the East Africa Commission of 1926 and the Commission on Closer Union of 1928. Great economies could be effected by this. In place of the complete and separate accounting staff which it is now necessary to maintain at Tanga the work could be handled by a few additional clerks at Nairobi. It would no longer be necessary to keep large stores at Tanga which lock up capital and require staff to administer them. The locomotive workshops could be abolished and the work handled at Nairobi more economically; if the transfer is not made, the present Tanga workshops will have to be remodelled and largely re-equipped at heavy capital cost. On the traffic side, substantial economies can be effected in working; to take one example, as I have mentioned earlier, the bulk of the imports come to Moshi from Kilindini with the result that empties have to be run from Tanga to Moshi to carry away produce whilst the Kenya & Uganda Railways’ wagons return empty from Moshi to their main system.

The difference in braking would mean that Kenya & Uganda type stock would have to be used throughout, but fewer of these would be required than are now necessary of Tanganyika type. I discussed with / the General Manager of the Tanganyika Railways the disposal of the present rolling stock on the Tanga line. He informed me, after examining the question, that, apart from some of the stock which is now practically worn out and would, in any event, have to be scrapped in a year or two, the remainder could all be transhipped to Dar-es-Salaam. The effect of this transfer of stock to the Central line would be sufficient
to relieve the Railways of capital expenditure on these items for one year but probably not for a longer period. There will thus be no waste or excess of stock and the smaller amount of extra stock which the Kenya & Uganda Railways may have to buy for the Tanga line will be compensated by the saving in new stock on the Central line less the cost of transfer from one line to the other. Even should capital expenditure have to be incurred on this count, the interest charges will be small compared to the economies effected.

If the working of the Tanga line and port were handed over to the Kenya & Uganda Railways, they would still remain the property of the Tanganyika Railways, and the Kenya & Uganda Railways would merely act as their agents for managing it. No capital expenditure could be incurred without the previous approval of the Tanganyika Government and the annual estimates for working it would also have to be approved, the net profit or loss alone appearing in the Tanganyika Railways’ Estimates. Similarly, all rates and alterations to them would have to be approved by the Tanganyika Government. Nor do I see that any difficulty in respect of legislation need arise; the present Kenya & Uganda Railways Ordinance would have to be applied to the system and the usual legislative powers obtained from the Tanganyika Government for this purpose. There is, so far as I can see, no serious legislative or administrative difficulty in doing this, especially as the present Tanganyika Railways Ordinance, modelled on the Indian Ordinance, itself requires revision. The case is, in short, so strong that I can see no valid reason against it, and I would repeat that this view is strongly endorsed by both of the two independent commissions who have reviewed the question in recent years.

137. During my visit the two General Managers were framing in collaboration a scheme for this purpose; the basis of this scheme was that the Kenya & Uganda Railways should take over and work on behalf of the Tanganyika Railways not only the present Tanga line and port, but also the newly completed Moshi-Arusha extension. Both main lines, i.e., the Tanga and Kenya & Uganda Railways, would grant ‘branch line terms’ to traffic emanating from or going to stations on the new extension. The Kenya & Uganda Railways would pay for running rights over the Kahé-Moshi section, but on a different basis from now.

I do not propose to give any details of the scheme because, from the excellent spirit which was apparent in these discussions at which I was present in an unofficial capacity and from the obvious desire of the two parties to come to an arrangement which would be fair to both, there is every reason to hope that an equitable and practicable scheme will be framed. A voluntary solution of this kind will obviously have the best prospects of success. Should the negotiations unfortunately fail or any hitch occur, I would recommend that the matter should be subjected to arbitration.
Given a proper solution to this question, the Tanga line should no longer be a source of loss to the Railway System. There has already been considerable local development, as the traffic figures show; some of the schemes, too, have not yet reached the producing stage. The line should, as a result, soon be able to show a balance after making full provision for current renewals and capital charges. The question, in fact, is of such importance to the future financial prosperity of this line, and hence of the whole system, that no obstacle of terms, rates or legislation should be allowed to stand in the way.

138. To provide for the development of the whole system, the General Manager estimates that the normal capital requirements for the next three years will be as follows:–

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1930/31</td>
<td>£422,500</td>
</tr>
<tr>
<td>1931/32</td>
<td>£355,500</td>
</tr>
<tr>
<td>1932/33</td>
<td>£279,100</td>
</tr>
</tbody>
</table>

These sums make no allowance for improving the Tanga workshops and are apart from special items such as the provision of a new lake steamer and the improvements to the harbours and wharves at Dar-es-Salaam and Tanga. The new traffic yard at Dar-es-Salaam is also additional.

On the sums asked for the Railways are prepared to pay interest out of their own revenue and do not ask for assistance from the Colonial Development Fund. The largest items are £650,000 for locomotives and rolling stock, and £153,000 for the programme for building quarters, which includes the provision of permanent quarters for Asiatic and African staff. Both items are spread over the three years. As I have pointed out earlier in this chapter, the hope of financial stability for the system rests on further development and it is necessary that capital should be provided to cope with the development expected and in ample time so as not to retard it or divert it to other channels. I agree that the capital expenditure outlined above is reasonable and justifiable in order to attain this object.

139. These Railways are only just beginning to feel the effects of motor competition. On the Tanga line it has brought the growth of passenger traffic, which previously showed a good increase year by year, to a standstill, but elsewhere it has not made its appearance to any appreciable extent. With the completion of the bridge over the Ruvu, however, it is certain to be seen soon on the Dar-es-Salaam – Morogoro road. There is no time, therefore, to be wasted in deciding on the policy which is to be adopted towards it. The policy which is to control it is one, though, rather for the Government than for the Railways. All the latter can do is to meet it either by improving rates and fares and facilities or by instituting their own combined rail and motor service in competition. If the latter
policy is adopted, the Government lays itself open to the charge of competing with private industry.

The usual arguments that the motor has initial advantages in that it can pick and choose its traffic, leaving the lower paying exports to the railway and undercutting rates for the more remunerative imports, that it only pays a small part of the cost of constructing and maintaining roads over which it runs, all have particular force in this case as it is the Government which owns the Railways and has to find the money to pay for the construction and maintenance of the roads. It is, therefore, all the more to its interest to put a stop to competition. Wasteful competition in transport is bad enough in a fully developed country; in an undeveloped one with insufficient means of transport it is even worse as it means that energy and capital, which could be applied to the greater advantage of the community in opening up new tracts of country, are being absorbed in competition. /  

The extreme alternatives open to the Government are either to adopt the American system of ruling that all transport services must be licensed, licences only being granted for new services when it can be proved that the existing ones do not meet adequately the transport needs of the areas which it is proposed to serve, or it can place the two rivals on a fairer footing by making the motor pay a tax which is sufficient to pay for the total maintenance and capital charges of the roads over which it runs. The former has the drawback that it is rather cumbrous for a new country and the latter is open to the objection that it places a heavy burden on an instrument which is peculiarly fitted for development purposes.

I think it is possible to find a via media by way of a system of road tolls. Until recently road tolls have been looked upon as an anachronism, but with changing means of transport views on this point are changing also. It has the merit in a country like Tanganyika Territory that it can be applied to certain roads and not to others, and it can be varied according to whether the vehicle plies for public transport or not. Thus a stiff toll could be placed on all vehicles using roads competing with the Railways and still higher tolls could be levied on vehicles carrying public passengers or goods thereon, while any roads radiating from the Railways or in districts away from them could be exempted altogether. If this were combined with a moderate vehicle or petrol tax, definite assistance would be given to the man who is genuinely trying to develop the country, but the man who chooses to compete would have to pay in full for the facilities which he requires in order to enable him to do so. This is the lowest figure which he should be called upon to pay; in a new country I think it should be fixed higher so that he would pay also for a share of the upkeep of the development roads in order to give definite encouragement to those who wish to open up the country and definite discouragement to those who merely want to enter into wasteful competition to the detriment of the country as a whole. The collection of a toll
on these good competitive roads should present no difficulties as they could be levied at bridges and drifts where it would be hard to evade them.

140. So far I have dealt only with the development of the system as it exists and the best policy to adopt to that end; the question of its development by the construction of new lines remains to be discussed.

In the letter presenting this Report I have explained that as a definite addition to my terms of reference I was asked to express my views as to the various routes in a southerly direction from the main line discussed by Mr. Gillman, the Chief Engineer of the Railways, in his report. These proposals cannot, however, be dissociated completely from the proposals for railway construction in other parts of the Territory; they are bound to react on each other in several aspects such as finance, labour and priority. I therefore propose to deal with the projects for a Southern railway as a part of the general programme.

The development of the Territory, including its railways, has been the subject of review by a local Committee formed by His Excellency the Governor to put forward proposals for financial assistance under the new Colonial Development Fund. This Committee was sitting while I was at Dar-es-Salaam and I had the advantage of a full discussion with it on the subject of a Southern railway.

The various proposals for the construction of new lines in the Territory are as follows:

(1) Manyoni – Singida line, more properly now described as the Iramba Plateau Railway, as the actual terminus will according to the latest proposals not be at Singida but at Kinyangiri, 22 miles further on. The line will be about 94 miles long and will cost approximately £557,000, excluding interest during construction. A location survey has been made, and the economic survey shows that, five years after completion, the probable annual deficit will be £2,715, after allowing for loan charges. This would be set off by the indirect benefit to the revenues of the Territory, including therein an increase of at least £10,000 a year in customs duties. After consulting His Excellency the Governor, I cabled on October 2nd recommending the allocation of funds for this project. These have now been granted, together with a free grant of interest for two years, which will amount to £30,000.

(2) Sanya – Engare Nairobi line. – This will be about 25 miles long and will cost approximately £130,000. A detailed survey has been made of this railway, but further investigation of one section is now in progress. The economic report by the Chief Engineer, drawn up in co-operation with the Traffic Manager, shows that a profit of £1,000 to £1,200 a year may be expected after 10 years’ working. The former Director of Agriculture, however, reported that there is not enough to go upon in order to decide from agricultural considerations whether a branch railway should be provided for this region or not, and recommended that the question be postponed for at least three years. The report of the Chief Engineer,
which has been carefully prepared on conservative lines, allowing for example for the complete failure of the grain crop every third year, carries more conviction to my mind than the report of the Director of Agriculture. I consider that the anticipated results, as foreshadowed in the Chief Engineer’s report, justify the construction of the line. His Excellency the Governor has asked for funds to be provided and that a free grant of interest for two years, amounting to £14,000, should be made from the Colonial Development Fund. I understand that these funds have now been allocated.

(3) (a) The Arusha – Dodoma line;

(3) (b) The Arusha – Singida line;

I have linked these two proposals together because the section from Arusha to Madukani at the South end of Lake Manyara is common to both. Reconnaissances have been made of both routes, but no detailed survey. The approximate cost of the Arusha – Dodoma line is given as £1,800,000 to £2,000,000 and the distance as 250 miles. The Arusha – Madukani section is roughly 100 miles long; no separate estimate has been made of this section but, if the same average per mile is taken as for the whole line, it would cost roughly £800,000. The Madukani – Singida line would be some 120 miles long, but only a preliminary reconnaissance has been made and no estimate of cost is given.

A question of alternative routes is thus involved; fortunately there is no need to give an early decision in advance of more detailed information, because the most productive section will be that between Arusha and Madukani which is common to both projects. This line would tap the Mbulu highlands and Mbugwe. The former is one of the most promising areas for white settlement. A good deal of land has already been alienated in the highland country as well as in the lower-lying districts served by the line, where considerable areas have been taken up for sisal cultivation. A certain amount of native production is also anticipated.

Judging this on general lines, it can be said that the line shows good signs of promise and serves both European settlement and native production at a cost of roughly between £800,000 and £1,000,000. The General Manager hopes that the Arusha – Dodoma line would pay its way in ten years after completion. This, the best section of it, would therefore probably become a paying proposition in a shorter time. By commencing construction at the Arusha end, not only will the best section be developed first but the trend of development on the alternative routes, Madukani – Dodoma, Madukani – Singida, can be watched and the final decision delayed until a clearer idea has been obtained of their respective merits.

The local Colonial Development Fund Committee made a definite recommendation in favour of the Arusha – Dodoma line on the grounds that it would form part of an ‘Imperial Link’ and only recommended that the connection with the future Singida line should be surveyed, I deal later with the question of an
‘Imperial Link’ and consider that it is premature with the scanty information now available to decide which route should be taken between Madukani and the Central line.

(4) The Mombo – Kilosa line. – This line was surveyed by the Germans and the estimated cost at present day prices is £1,500,000.

The former Director of Agriculture in his evidence before the local Colonial Development Fund Committee laid stress on the greater potential agricultural value of this line over the Arusha – Dodoma line, though it appears doubtful whether in this connection he took into account the possibilities of the Mbulu highlands and the recent sisal developments near Mbugwe.

The General Manager also appears to think it slightly better on economic grounds and hopes that it would pay in between five to ten years after completion as against ten years after completion in the case of the Arusha – Dodoma line. In the Committee he preferred, however, the Arusha – Dodoma route because the Mombo – Kilosa line was too close to the sea and to a coast road.

The Committee decided to recommend the Arusha – Dodoma line for financial assistance under the Loan on the grounds, before mentioned, of its forming part of an ‘Imperial Link,’ and that the extension of sisal production in the North of the area traversed by the Mombo – Kilosa line and of cotton production in the South would automatically provide and pay for branch lines to these areas from the Central and Tanganyika lines respectively.

Apparently the Mombo – Kilosa route would pass through a poor traffic country in its middle section whereas both ends would give good results. On the other hand the Arusha – Central line railway would traverse a stretch of poor country after Madukani had been reached. The argument as to proximity to the coast carries little weight with me as there is no port intermediate between Tanganyika and Dar-es-Salaam to carry the produce from this area. Both this argument and the recommendation of the Committee appear to have been prompted by the idea of a so-called ‘Imperial Link.’

From this comparison of evidence it is difficult to obtain any clear idea of the respective merits of the two routes. It would probably be better to class them at present as about equal from the economic point of view.

(5) The Kahama – Kagera – Uganda line. – This line is not shown on the accompanying map. It would start from Kahama (close to Maveta’s) on the Tabora – Mwanza branch and go in a north-westerly direction to the elbow of the Kagera River near Kaseke and thence to the Uganda border. There is a German survey of the section as far as the Kagera and a rough estimate for the whole line places the cost at £2,500,000.

The local Committee included this line in its proposals on the grounds that the mineral deposits on the Kagera were assuming large proportions and that the
line would to a certain extent tap Ruanda and give a valuable junction with the 
Kenya & Uganda system west of Victoria Nyanza, but placed it last on their list.

The only information I can gather as to the mineral deposits is vague; the 
development in sight at present certainly does not justify a railway. The Belgians 
are already starting construction to tap the larger part of Ruanda from the other 
side, and, with the existing connection between the Kenya & Uganda and Tang-
anyika systems by steamer across Victoria Nyanza, there is no need at present to 
contemplate another connection to the west of it.

I think, therefore, that this can be classed as the least important of the pro-
posals to be discussed.

(6) The Southern Railway. – Before entering into the respective merits of the 
three alternative routes for this railway, I think it would be advisable to dispose 
of the loose generalities which have been associated with the project for a South-
ern line. It has been frequently represented during the last two or three years that 
physical connection should be made between the railways of Kenya & Uganda, 
Tanganyika and Rhodesia. By far the most expensive section of this connection 
would be that between the Tanganyika and Rhodesian systems. The cost to the 
Rhodesian border would be about £5,500,000 and the extension thence to meet 
the Rhodesian system would require at least £4,000,000 more, in both cases 
exclusive of interest during construction. These figures do not include also the 
cost of connecting the Kenya & Uganda Railways with the Tanga and Central 
lines.

The scheme has not been advocated on economic grounds; it has been 
frankly admitted that there is no hope of its paying for many years to come. 
Twenty to twenty-five years after completion is the earliest date given by which 
such a line would start to pay and even longer periods have been quoted to me by 
supporters of the scheme; and the reason for this is obvious. Goods traffic with 
the Union of South Africa will be carried by sea, and goods traffic with Rhodesia 
in the absence of any large mineral discoveries in the north-eastern corner of that 
country will be negligible.

Similarly, its supporters have not claimed that it is necessary on administra-
tive grounds. Excellent precedents could be quoted to show that railways which 
are not economically justified may yet be sometimes necessary for purposes of 
administration. No attempt has been made to prove that this is the case here. 
Nor has the scheme been put forward on strategic grounds. / 

In the absence, therefore, of any of the usual reasons for building railways, 
either economic, administrative or strategic, its advocates have coined a phrase 
and state the expenditure of these millions on a railway from Nairobi to Broken 
Hill is necessary in order to provide an ‘Imperial Link.’ It is noteworthy that in 
the first report recommending the construction of a Southern Railway, that of 
the East Africa Commission of 1926, this phrase does not occur. A Southern
Railway is there recommended as being required for the development of the Territory itself.

What exactly are the functions of an ‘Imperial Link’ I have been unable to discover. I am doubtful if the users of the phrase have themselves any clear idea of what they are. Putting the widest construction on the term, it means that there will be ease of communication between the East African Colonies and the two Rhodesias, and this ease of communication applies solely to passengers because no one pretends that there will be any considerable interchange of goods. The Union of South Africa is excluded because, as in the case of goods, a means of communication already exists, almost as quick, quite as comfortable, and far cheaper – the Sea.

It is strange in these days of motors, aeroplanes, and airships to hear of proposals to spend millions of pounds on railway construction for the purpose of promoting passenger travel in a sparsely populated country. If this is the object, it would cost the Government of Tanganyika less to improve the roads, put a fleet of expensive motors on them, and carry the passengers free rather than incur the high loan charges and heavy operating costs of an ‘Imperial Link’ for this purpose. From the Imperial point of view, from whatever source these charges are met, whether wholly by the Home Treasury or by the Local Treasury or shared between them, nothing could be better calculated to embitter mutual relations than the constant drain, year in, year out, of the large sums required to subsidise a railway built on such a shadowy pretext as this.

The parallel of the Cape to Cairo Railway will be quoted against me, but the positions are exactly reversed. Rhodes invented the phrase, not, as here, to cover up the lack of any economic justification, but to stimulate public interest in a project, each stage of which had a definite economic goal in front of it at the time of its construction – first the goldfields of Rhodesia, next the Wànikie coal mines, and so on.

I have written thus strongly because there is danger in these phrases, as can be seen by the influence which this one has had on such documents as the reports of the local Colonial Development Fund Committee and of the Chief Engineer. Having cleared the subject of these vague, high-sounding titles, let us review the situation as it exists and see what is required in the interests of the Territory in the immediate future and what is likely to be required after that so far as it is possible to foresee it at present.

To the south of the Central line there lies a great expanse of country, 600 miles long by roughly 350 miles wide, which is totally devoid of railways. In this huge space there are areas which will repay development, even though several years may elapse before the stage of repayment is reached. How can these areas be best developed with due regard to economical considerations, the lines chosen being, so far as possible, those which are capable of extension and perhaps
ultimately connection with neighbouring systems, should future circumstances show that this is desirable?

Three main projects have been formulated:–

(a) Dodoma – Iringa – Ilongo – Fife.
(b) Kilosa – Ifakara – Mpanga – Manda.
(c) Kilosa – Ifakara – Mpanga – Ilongo – Fife.

A detailed tacheometric survey has been made of the Dodoma – Iringa section of the first route and of 60 miles from the Rhodesian border north. A reconnaissance has been made of the rest of the line. Only reconnaissances have been made of the other routes, with the exception of the 60 miles mentioned above, which is common to routes (a) and (c).

The length of the Dodoma – Fife line would be approximately 460 miles to the Rhodesian border and cost about £5,500,000. The Dodoma – Iringa section would be 140 miles long and cost £1,100,000. All these figures of cost, as well as those which follow, exclude interest during construction.

The Kilosa – Manda line would be about 470 miles long and, according to Mr. Gillman’s report, would cost about £4,000,000, while the length of the Kilosa – Fife line would be approximately 590 miles and its cost about £6,000,000. The Kilosa – Ifakara section would be about 120 miles long and cost £950,000.

Of these alternatives I propose to discuss the Kilosa – Manda route first. This is the line favoured by Mr. Gillman. As opposed to the Kilosa – Fife line, it will depend for its traffic, apart from the Kilombero Valley, which is common to both, on the Songea district and the basin of Lake Nyasa. It is aimed primarily at tapping the area of a neighbouring colony, and in the traffic of that country the Imperial Government is directly interested through the guarantee by the Nyasaland Government of the debentures of the Trans-Zambesia Railway. This interest will become far greater if it finds the money for the construction of the Zambesi Bridge and of the railway from Blantyre to Lake Nyasa. Any idea of competition for this traffic could not be permitted. Further, this route leaves untouched the whole of the south-west highlands, except in so far as they would be served by steamer across Lake Nyasa; it would tap none of the country west of Ubena and very little, if any, of Ubena itself. Therefore, despite its lower capital cost, I think that the Kilosa – Manda route should be ruled out.

Of the other two, the Dodoma – Fife line, as far as the crossing of the Ruaha, runs through barren country, nor can much traffic be expected until the neighbourhood of Iringa itself is reached. In this area and around Dabaga to the south-east, European settlement is taking place. Thence to the junction with the Kilosa – Fife line further settlement is also taking place at Sau to the east of Bueni.

The first section of the other route, that between Kilosa and Ifakara, is universally acknowledged to be the most promising scheme in the country, with the
possible exception of the Iramba Plateau Railway. It opens up the fertile valley of the Kilombero, which is already well known for its rice. There are excellent possibilities of development both in rice and cotton, either by direct native production or by a concession company on the metayer system like the Sudan Plantations Syndicate. Sugar production also holds out good hopes. The whole valley of the Kilombero can be tapped by means of water transport, either by canoe or by launches and barges, and the possibilities of the latter are now being examined. The General Manager estimates that this section would bring in sufficient revenue in five years after completion to pay interest charges.

From Ifakara the line would follow the valley of the Kilombero and its tributaries, skirting the escarpment of the Uhehe highlands. Unfortunately, although the line would run within 20 miles of Dabaga, the escarpment is so steep that no feasible road could be made for motor traffic. The railway would thus gain no traffic whatever from its western side; it would have to depend entirely on the valley. This is a disadvantage in so far as a large portion of this traffic would probably be attracted to the railway even if it was not extended beyond Ifakara. But, on the other hand, the advance of the railway up the valley would be bound to stimulate production and would free labour from canoe transport to work on the land. From Mpanga west to the junction with the Dodoma – Fife line this railway would serve the European settlement areas of Eastern Ubena and also of Southern Uhehe.

The local Committee has recommended that the Dodoma – Fife route should be chosen as that of the Southern Railway in preference to the Kilosa – Fife on the grounds that, though the latter would reach the paving stage sooner, a branch line only to Iringa would run at a loss. Rail connection with that area could only be justified as part of a through line, and without such connection European settlement would be checked, if not completely stopped. On the other hand, the construction of a branch railway from Kilosa – Ifakara was justified on its own merits and the produce of the Kilombero Valley could be thus evacuated adequately for a very long period in conjunction with water transport.

To disagree with the unanimous recommendation of a strong local Committee, of which the Colonial Treasurer is Chairman and the General Manager of the Railways is a member, is at any time a serious matter; it becomes all the more serious when the fate of a young European settlement is in the balance. It is therefore only after much anxious thought that I have decided that I must oppose this recommendation of the Committee.

The Kilosa – Fife route is admittedly the one which will be the first to reach the stage of paying for itself. From the point of view of cheapness of operation, such advantage as there is also lies with that route. The potential wealth of the Kilombero Valley is not disputed. In the matter of European settlement, of the lands which have been or could be alienated according to the report of the
Land Development Survey, 502 square miles in Ubena and Lupembe and near Mufindi would be better or equally as well served by the Kilosa – Fife as by the Dodoma – Fife line, 406 square miles of alienated or alienable land in the Iringa, Dabaga and Kisinga areas would not be served at all by the Kilosa – Fife line, with the probable exception of the Sau end of the Iringa area, which would be within about 40 to 50 miles of it. I exclude from both the Ukwama area, which is 70 miles due east from Iringa, and, although within less than 20 miles as the crow flies from the Kilosa – Fife line, is cut off from it by the escarpment. / The whole question, therefore, turns round this pocket of land in the neighbourhood of Iringa and Dabaga. Is it justifiable to divert the through line from the route which is admitted even by its opponents to be economically the sounder, merely in order to serve an area which the same people admit would not be able to pay for a branch railway?

It is conceivable that in very exceptional circumstances such a course might be justifiable if these were the only two proposals for railway construction in the Territory. But this is far from being the case; on the contrary, the Dodoma – Iringa section, or for that matter the Dodoma – Soliwaya section, has worse prospects of success than any of the proposals I have enumerated earlier, with the possible exception of the Kahama – Kagera line.

The recommendation of the Committee would give it priority over the Arusha – Madukani, the Madukani – Singida, the Madukani – Dodoma, the Mombo – Kilosa and the Kilosa – Ifakara schemes.

It would not only mean priority in finance. That would be serious enough because, although Imperial assistance might and would probably be granted, that assistance cannot be regarded as unlimited, and the greater the amount absorbed by any one project in any one colony, the less there would presumably be for other projects in the same colony. It means also priority in construction and labour. The General Manager calculates, after consulting the labour authorities, that not more than two sections, each doing 60 miles of construction in a year, could be maintained, or at the very most three. It would take, according to the General Manager’s figures given to the Committee, six years to reach Ilongo. I take Ilongo because obviously with the poor prospects of the Dodoma – Iringa section it is of the essence of the scheme that the line should be pushed on straight away to tap the further areas. Allowing that it has a start of two years because it is the only one where survey is completed, that would mean that all the other more promising proposals would be put back four years. The mere fact that it alone has been surveyed in detail cannot justify such a priority as this.

Thus to the argument that the Dodoma – Fife route would be economically the weaker is added the argument that, by absorbing finance and labour, its adoption would cause a check of four years to the development of the Territory by means of other more promising schemes. To my mind these arguments are
so strong that the interests of one particular district cannot be allowed to stand against them, and I therefore recommend the adoption of the Kilosa – Ifakara – Fife route as that which should be adopted for a Southern Railway.

I realise with regret that this recommendation, if adopted, may mean a definite check to the development of the Iringa area, where European settlement has already made some headway, but, if the figures in the Land Development Survey are accepted, there will only remain in the Central Uhehe, Dabaga and Kasinga areas, apart from the 276 square miles which have already been alienated, a further 130 square miles which are alienable and fit for European settlement.

I wish it to be clearly understood that there is no question here of European settlement against native production. The Kilosa – Fife line will open up areas for European settlement which, although not as large as those on the other route, are only some 100 square miles less, and the Arusha – Madukani line, whose construction I will recommend later in this report, has European settlement as its primary object.

I think it would be suitable here to touch on a point raised by His Excellency the Governor in one of his dispatches. In it he expresses the opinion that ‘if the southern highlands of Tanganyika are to be developed, the key position from the point of railway construction must be found somewhere about Northern Ubena, which represents 352 kilometres of new railway construction from Dodoma as compared with 589 kilometres from Kilosa, the difference in the length of haul on the main line, in favour of the latter, not being extremely material.’

As regards the former figure, I think His Excellency has been led to assume an incorrect kilometrage owing to Mr. Gillman in his report referring to the second division of the Dodoma – Fife survey as being the Kalenga – North Ubena section. This line only enters Ubena at kilometre 375 and I think that the key position as defined by His Excellency should be placed preferably at the junction, which is about kilometre 400. As against this the length to Kilosa would be 590 kilometres, or a difference in favour of the former of 190 kilometres or 120 miles. But the longer route is traffic-producing for practically the whole of its length and over such a line goods can be hauled at much lower rates than over another line without this advantage, even if it is 120 miles shorter. And if this, the most important consideration, is left out and only the length of haulage is considered, I cannot agree that the haul over the main line is not material. The distance in favour of Kilosa is in this case 109 miles, which balances the extra haul over the branch.

Programme of construction.

141. The general programme of construction remains to be discussed. This programme should be based on the idea of constructing 120 miles of railway each year and temporary fluctuations in the revenue of the Territory should not be allowed to interfere with this. On this basis and on the basis that the con-
struction of the Iramba Plateau and Sanya – Engare Nairobi branches have been sanctioned, I think that three survey parties should be put into the field at once to make a detailed survey of the Kilosa – Ifakara, Arusha – Madukani and Mombo – Kilosa routes. I place these in what I consider the order of precedence. I give priority to the Arusha – Madukani line over the Mombo – Kilosa one because, although in the light of present information they may be classed roughly as equal from the economic standpoint, the former will serve both European settlement and native production, whereas the latter does not cater for European settlement at all; neither does the Kilosa – Ifakara line in this, its first section. Further, if the Kilosa – Ifakara and Mombo – Kilosa lines were under construction at the same time, it might be difficult to find sufficient labour for both, as they would apparently draw upon much the same districts for their labour supply.

The construction of the Iramba Plateau Railway will take two years and of the Sanya – Engare Nairobi line six months. Within one year of the start there should be sufficient of the Kilosa – Ifakara line surveyed and located to allow construction to begin. Six months, or perhaps one year, will thus elapse during which only one line is under construction and to this extent the standard of constructing 120 miles a year will not be reached. Taking the latest date, in one and a half years from the start it should be possible to begin the Kilosa – Ifakara line and in two years the Arusha – Madukani line. In three and a half years the Kilosa – Ifakara section will have been finished and work can be started on the Mombo – Kilosa line. Surveys, both engineering and economic, will in the meanwhile have been in progress on the Madukani – Dodoma, Madukani – Singida and Ifakara – Soliwaya lines. In four years’ time these should have been completed and a decision can be taken as to which of the lines from Madukani should receive priority. By that date the Arusha – Madukani line will have been finished and work can be started on whichever of its extensions has been chosen. In five and a half years’ time the Mombo – Kilosa connection will have been built and the Ifakara – Soliwaya line can be started.

This programme must necessarily only be a tentative one. New circumstances may arise at any time which will necessitate the revision of the factors on which it has been based. One of the essential features is that there should always be at least three strong survey parties in the field. Money spent on surveys is amply repaid subsequently in cutting down costs of construction and even more sometimes in cutting down operating costs. It is also important that it should be carried out well in advance; otherwise, when finance becomes available, decisions and sometimes construction have to be delayed until further information and survey have been obtained. The present case of the Southern Railway affords an excellent instance, though it would be rather hard to place the blame for this solely on the shoulders of the Tanganyika Railways. So much attention has been attached to the Dodoma – Fife line and the idea of an Imperial Link that the
farthest 60 miles of that route have actually been surveyed in detail in preference
to the more pressing schemes which lay closer to home.

Government assistance for development lines.

142. This programme of 120 miles a year would mean the addition of from
three-quarters of a million to a million pounds every year to the capital expendi-
ture of the Railways for new construction alone. Also, apart from the Kilosa – Ifakara line, none of the others is expected to be able to pay interest charges in
less than seven to ten years. This is a heavy burden for a system in the financial
situation of the Tanganyika Railways to face, and they should not be asked to
face it unaided – and the aid to which I am referring is not merely such as can
be sought from the Colonial Development Fund but from the Territory itself.
The profit which the Government gains from the development of the Territory
is considerable, as is witnessed in the case of the Iramba Plateau Railway, where a
loss of £2,715 is expected in the fifth year after completion, although full credit
has been given to it for the increase in traffic which it produces on the main line,
whereas the Government will benefit by an increase of £10,000 a year in customs
duties alone. The Railways are, in fact, developing these lands in the interests of
the Territory even more than in their own. It is right, therefore, that the Ter-
ritory should help to bear the burden. The aid which I propose that it should
give is that when a new railway is built which it is estimated will not pay its
way, including capital charges, within five years after completion, the Territory
should pay for all losses until it reaches the paying stage. Where it is estimated
that it will pay in less than five years, the losses incurred in the intervening years
should be borne by the Railways. The Government, if it so required, could be
represented in the assessment of the anticipated revenue. /
EDITORIAL NOTES

Hammond, *Report on the Railway System of Southern Rhodesia*

1. *Lieut.-Colonel Sir John R. Chancellor*: Lieutenant-Colonel Sir John Robert Chancellor (1870–1952), British soldier and colonial official. Governor of Mauritius (1911–16), Trinidad and Tobago (1916–21) and Southern Rhodesia (1923–8) and Principal Assistant Secretary to the Committee of Imperial Defence (1922–3).

2. *ex post facto*: formulated, enacted, or operating retroactively.

Smith, *Report upon the Administration, Organisation and Working of the Natal Government Railways*

1. *ballasted*: Ballast is coarse gravel or crushed rock laid to form the bed of a railway.

2. *the permanent way*: The permanent way is the track of a railway, including the ballast, sleepers, rails, etc.


4. *overmantels*: An overmantel is a structure over a mantelpiece, usually of plaster or carved wood.

5. *Platelayers*: A platelayer is a labourer who lays and maintains railway track.

6. *Electric Train Staff System*: This signalling system was patented by Webb & Thompson in 1889 and licensed to the Railway Signal Co.

7. *Weighbridge*: A weighbridge is a machine for weighing vehicles by means of a metal plate set into a road.

8. *waybills*: A waybill is a document giving details and instructions relating to a shipment of goods.

9. *Purser*: the officer in charge of money matters on board a ship/aircraft.

10. *‘Reid’ class*: These were first used from 1899 and 1903 by the Natal Government Railways (NGR) and were built to the specifications of G. W. Reid, Locomotive Superintendent of the NGR at the end of the nineteenth century. They were later adopted by South African Railways and renamed ‘class H’ engines (D. F. Holland, *Steam Locomotives of the South African Railways, Volume 1: 1859–1910* (Newton Abbot: David & Charles, 1971)).

11. *louvre*: A louvre is a frame with fixed or movable horizontal slats for admitting air and light or preventing the entry of rain.

12. *Turntables*: A turntable is a rotatable platform with a track that is used to turn locomotives. Pumping stations provided the water required by locomotives.
13. **carriage footboards**: A footboard is a board or small raised platform at the entrance of a carriage.

14. **Buffers**: Buffers lessened or absorbed the shock of impact.

Herbert Frankel, *Memorandum*


Hammond, *Report on the Sierra Leone Government Railway*

1. *Royal Engineers*: The Corps of Royal Engineers, commonly known as the *Sappers*, is one of the corps of the British army. It provides military engineering and other technical support.

2. **Demurrage**: Demurrage is the compensation paid for the detention of a ship or freight car during loading/unloading beyond the scheduled time of departure.

3. **pro forma balance sheet**: A financial statement prepared to consider the effects of a potential activity, for example, the purchase of another company.

4. **Puncheons**: A puncheon is a cask with a capacity of from 72 to 120 gallons (273 to 454 litres).

5. **artizans**: An artisan is a skilled manual worker.

6. **firemen, turners or fitters**: A fireman is a stoker. A turner is a person who operates a lathe. A fitter is a worker who assembles and/or adjusts machinery.

7. **After two**: A pointsman is a person who operates railway points. A maintenance boy is a handyman.

8. **fu-fu**: Fu-fu is a thick, dough-like West African food produced by boiling and pounding yam, plantain or cassava.


1. *the Ost Afrikanische Eisenbahn-Gesellschaft (O.A.E.-G)*: The Ostafrikanische Eisenbahngesellschaft (in English the East African Railway Company) was established in 1904 to promote a railway from Dar es Salaam to Lake Tanganyika. See M. Amin, D.

Hammond, *Report on the Railway System of Tanganyika Territory*

1. *firing*: Firing involved shovelling coal into a locomotive's firebox.
2. *axle boxes*: An axle box is the journal box (a housing containing a journal and its bearings) of a rotating axle.
5. *Sentinel rail cars*: a guards van.
6. *Great Western Railway Company*: The Great Western Railway (GWR) was a railway company that linked London with the south-west and west of England and most of Wales. It was founded in 1833. H. C. Smith Ltd versus the Great Western Railway Company is still quoted in common law. It laid down that ‘he who asserts must prove’.
7. *Railways Act of 1921*: The Railways Act of 1921, known as the Grouping Act, was intended to stem the losses of the UK’s railway sector. It sought to dampen internal competition and to retain some of the benefits which the country had derived from a government-controlled railway during and after the First World War.
8. *King’s African Rifles Commitment*: The King’s African Rifles (KAR) was a multi-battalion British colonial regiment raised from the various British possessions in East Africa from 1902. Officers were mostly seconded from the British army. The soldiers were African.
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**Operation**

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**Editorial Notes**
The operation of lines is discussed in the thematic introduction to Volume 3 of this collection. The sources in this section continue the exploration of how African lines were managed. It begins on a bright note with a description of the celebration held to mark the opening of the Lagos–Ibadan Railway in which the idealistic belief that railways offered a lucrative panacea to the economic and social ills of the world is revealed in all its glory (see Opening of the Lagos–Ibadan Railway for Traffic (1901), below). Harsh reality then makes its appearance and the following seven sources explore the myriad ways in which administrations sought to ensure that works covered their costs or even earned a profit. The South African authorities seek a solution in the perennial private versus public sector ownership debate (see Hoy, State Ownership and Operation of Railways (1919), below). Nigeria investigates how traffic can be increased, the Gold Coast finds financial salvation in cost cutting and the Beira and Mashonaland Railway simply raises railway tariffs, bringing upon itself a wave of criticism from local traders and UK Chambers of Commerce, who claim the policy is destroying business and trade (see Governor Sir W. MacGregor to Mr. Lyttelton (1904 Railway Retrenchment Committee Report and Recommendations (1932); and The Birmingham Chamber of Commerce to Colonial Office (1905), all below). Others seek to engender cooperation and coordination. The Ugandan government examines the possible amalgamation of the protectorate lines with the Uganda Railway and the likely cost savings and cross-subsidization that would arise (see The Governor of Uganda to the Secretary of State (1914), below). The Gold Coast then takes the policy one step further, contemplating an alliance of road and rail services, and the Manse report is more ambitious yet, seeking that holy grail of all governments, the uniform transport policy, in this case the coordination of Kenyan, Tanganyikan and Ugandan rail, road, aerial and water-borne transport (see Mance, Report on the Co-ordination of Transport in Kenya, Uganda and the Tanganyika Territory (1937) and Gurney, Report of the Road-Rail Transport Committee (1945), below). The section ends with two snapshots of British African railways in 1915 and 1927 and a detailed technical review of the locomotives and
rolling stock used upon them (see Mance, *The Railway Systems of West Africa* (1913); Anon., ‘The Railways of Africa’, *Railway Gazette*, 21 November and 5 December 1927, and Anon., ‘Some Typical Modern Locomotives and Rolling Stock for African Railways’, *Railway Gazette* (November 1911), all below).
Monday the 4th of March will always figure as a red letter day in the annals of the history of the Colony, owing to the unique ceremony in connection with the opening of the Lagos-Ibadan section of the railway which took place on that date. The announcement made previously that the ceremony would take place, and that the day would be observed as a public holiday, tended to enhance public interest, and expectation was at its highest. Although the ceremony was fixed to take place at 10 a.m., from early morning the population began to gravitate towards Iddo Island, and as the morning advanced the stir increased and both by land and water there was a continuous stream of people making their way to the Island. The opening for use of the Carter and Denton bridges, while affording great facility to the public, served to impart additional interest and
attraction, and by 10 a.m., an immense concourse of people had collected on
the Island. The terminus and station were gaily adorned with flags, the long car-
riage shed being tastefully decorated with flags and palms and converted into a
huge salle a manger for the entertainment of the people. At 10.30 a.m., a train
gaily decorated steamed in from Abeokuta with the Alake and Council of that
country as passengers. A guard of honour of Hausa\(^2\) soldiers was drawn up at
the entrance to the shed and the distinguished guests having alighted, were con-
ducted by the Hon’ble Acting Colonial Secretary, through the opening made
by the cordon of soldiers into the spacious refreshment hall where they were
received by the / company which numbered thousands and represented every
section of the community. A few minutes later, His Excellency the Governor
accompanied by the Hon. Acting Colonial Secretary and the Private Secretary
and Aid-de-Camp, entered the hall, while the guard presented arms, and the
band played the National Anthem. Shortly after Prince Eleko and the White
Cap Chiefs of Lagos entered the hall. The whole company then sat down to
luncheon, the Alake and Egba\(^3\) Chiefs being accommodated with seats on the
right of the Governor, and over four hundred persons did justice to the good
things provided, while thousands of others were entertained under booths else-
where. After dining, His Excellency in a felicitous speech proposed the toast of
‘His Majesty King Edward the VII.’ His Excellency said:–

[...] Ladies and Gentlemen, – I have asked you to come here to-day to
assist at the inauguration of a great work, to take part in the opening of the Lagos
Railway, by far the most important undertaking of the kind ever carried to com-
pletion on the West Coast of Africa. This day is therefore not only one of deep
significance to Lagos, but it is also an event of much historical interest for the
whole Coast. This inauguration will always be conspicuous as being the first one
of the king on this part of the continent. It will be followed soon by similar
ceremonies in the neighbouring colonies, in Dahomey, in the Gold Coast, and
probably in Southern Nigeria.

HISTORY OF THE RAILWAY.

The first proposal for the construction of a railway here, so far as I have been able
to discover, originated in July 1893 with a body called ‘The Western Syndicate’,
at the head of which was Mr. Alfred L. Jones / of Liverpool. They proposed to
build railways in West Africa and to begin with Lagos. Their idea was to start
from some suitable point on the Lagoon and to proceed to Ibadan by Jebu Ode.
Lord Ripon\(^4\) transmitted the proposal to Sir Gilbert Carter\(^5\) the Governor, in
November 1893, for report. The Governor replied on the 23rd February 1894,
informing the Secretary of State that the Legislative Council was prepared to
vote money for the necessary survey. The Chamber of Commerce also approved of a railway.

The Governor thought the railway should start from Ejinrin of Epe. He added that doubtless it would be ultimately carried to the Niger.

Lord Ripon approved of the survey, 2nd May 1894. His Lordship said the railway might ultimately be extended to Ilorin, and possibly to the Niger.

The preliminary survey was completed in May 1895, and the work of construction was started on both bridges and railway in December of the same year, and this has been continued ever since.

The total length of the line from Iddo Island to Ibadan is 123½ miles, and that we are now opening to traffic.

The work of construction is still going on at Aro, where a bridge is being built to carry a branch line over Ogun to the town wall of Abeokuta. This line will be about three miles in length.

I am glad to be able to inform you that the Secretary of State has given orders that the construction of a steam tramway to connect Lagos with Iddo Island shall be commenced immediately. This tramway will proceed from the railway terminus on Iddo Island across the Carter Bridge to Lagos, and after traversing the town will I hope go along the Marina to its southern end. We may therefore expect that this year will see the railway completed from the South end of Lagos town to Abeokuta and Ibadan.

USE OF THE RAILWAY.

The railway will undoubtedly be of immense use to the three towns of Lagos, Abeokuta, and Ibadan. It may be expected that the coming census will shew a population of some two score thousand people in Lagos, There may be upwards of twice that number in Abeokuta, and as many again in Ibadan as in Abeokuta. The railway traverses a country of considerable fertility.

A point of great interest to you now is whether the railway will pay. I for my part shall be satisfied if it pays working expenses this year. Next year it should do more. Now my own personal opinion is, that the surest way to make the railway pay is to have low rates for carrying both passengers and goods.

Mr. Hill, the Acting General Manager, has prepared table of rates based on a scale that is perhaps unprecedentedly low. It is the only sure way of making the railway useful; if it is not made useful it cannot pay. The policy of Railway management will therefore be cheap rates, and no free passes. The latter are infinite sources of trouble and abuse / wherever there is a state-owned railway. I shall wish to treat all alike as to free passes. I shall authorise no officer to grant a free pass after these opening ceremonies. I shall grant none myself. All therefore have the same treatment in this matter.
THE FINANCES OF CONSTRUCTION.

As the work is not finished I am not able to tell you what the total cost of the railway will amount to, but I may say that for our present purpose we may put it down at a million sterling. You will want to know how this money has been raised. It has been advanced from Imperials funds, and you now owe that money to the Imperial Treasury and are paying interest on it. I do not know whether we could have obtained the money in the market without the guarantee of the Imperial Government. If we could have done so we should have had to pay much more for it.

Now I may tell you that for a generation I have had good opportunities now and then of seeing how the Crown Agents for the Colonies manage financial matters on a large scale. I have often examined their methods and terms very carefully. I can only say that their management, wherever large sums of money are concerned, is excellent. The Railway has been financed by the Crown Agents, under the general guidance of a Secretary of State who is a first class man of business. You should therefore know that your financial interests in this railway matter have been well safeguarded.

THE MANAGEMENT OF CONSTRUCTION.

The general direction of construction has been in the hands of the Messrs. Shelford. I may say I have been surprised by the smallness of the remuneration they have received from this Colony.

Mr. Shelford has had a salary at a rate at which we could not obtain an Assistant Director of Works. He has taken a deep personal interest in this Railway and made it a point of personal honour to carry it to a successful issue in spite of the endless difficulties in the way, for remember it was new work in a new country situated at a great distance. You will therefore join with me in congratulating Mr. Shelford on the opening of this line to-day.

But the most gifted Consulting Engineer could not carry on such a work from London without able men on the spot here. Personally I can speak only of Mr. Knights as Chief Resident Engineer. Mr. Knights has had a difficult task to deal with, and unless he is rigidly self-critical he must feel that on the whole he has had a very unusual degree of success. Mr. Knights is not the man that would ever be wholly satisfied by his own performances, still he should feel that if he has made any small mistakes they are only just enough to remind him that he is after all human though not an ordinary man. You will find for yourselves that this railway is soundly and substantially built. I consider that we have been fortunate in having here the services of Mr. Knights, and in congratulating him I express the hope that he may yet in health and strength take this Railway over the Niger, and with pride and in honour assist at its opening ceremony at Kano.
EXTENSION OF THE RAILWAY.

The Railway is now at Ibadan. The question of the day is whether it is to go further or how far.

At the present moment a Survey party under the leadership of Mr. Gee is engaged in examining the country between Ibadan and Ilorin by way of Oyo and Ogbomosho. I believe this party will carry on the survey as far as Jebba; and will examine the alternative route from Ibadan to Ilorin by way of Ede, Oshogbo, Ilesha and Ikirun. The route from Ibadan to Ilorin by way of Oyo and Ogbomosho I have twice traversed and have found it to be comparatively easy. There the railway would cross rolling undulating country, with no rivers to bridge, no forest to fell, and with plenty of ballast at hand practically all along the line. No great embankments would be required, no very deep cuttings, certainly no tunnels. The consulting Engineers pronounce it not a remarkably easy country because it contains the divide between the Niger on one hand and the Ogun and Oshun on the other. One traversing the ground will not be frightened of the divide for the good reason that it is not easy to find it.

The extension of the line from Ibadan to Ilorin would therefore be comparatively cheap and easy.

THE RESOURCES OF THE COUNTRY.

Now what is the value of the resources of that part of the country that lies between Ilorin and Ibadan? And how far would the trade of Lagos be benefitted by this proposed extension to Ilorin? From personal observation I can speak only of the Oyo-Ogbomosho route. Let me say at once that up to the present no minerals have been discovered there. It is not a forest country, therefore there will be no timber to transport. The palm tree is not common at Oyo; it is somewhat rare at Ogbomosho. There would therefore be no palm oil or palm kernel trade of any consequence. There remain only the agricultural products of the district to fall back on. The soil consists of the average mixture of humus and sand, well adapted for growing maize, cassava, yams, and similar products. It is also probably exceptionally suitable for cotton, which the alternation of wet and dry seasons would perhaps favour. As one approaches Ilorin it is clear the country becomes poorer, and that it could send to Lagos practically nothing save a few beasts, some sheep, goats, cattle, and a few horses. I presume that most of what would be brought to Lagos by the extension of the railway to Ilorin comes to Lagos now, but what comes to Lagos from beyond Oyo cannot at present be very great.

Now if you ask me what in my opinion would be the financial result to this Colony of extending this railway from Ibadan to Ilorin, and no further, I shall tell you in one word, injurious.
Now I dwell on this point for a very particular reason I wish to shew / you that for your country for yourselves and for your children, this question is of vital importance.

Naturally on such matter as the extension of the railway considerable weight is attached to the opinion of the experts consulted.

Now in my humble judgment the opinion of the experts, as at present recorded, involves a very great danger to this Colony. It is, generally this. That in view of the cost of opening up at Lagos a harbour sufficiently commodious to accommodate the trade of the hinterland, another line should start for Northern Nigeria from a different and more suitable part of the coast; that a limited area should be set apart for the Lagos Railway the northern terminus of which should be Ilorin; that it would be courting failure to retain the terminus at Ibadan, and therefore it should be placed at Ilorin. My opinion of the extension to Ilorin and a permanent stoppage there, I have told you. If it is to court failure to stop at Ibadan, it is to ensure financial collapse to go to Ilorin and stop there. I say this deliberately after taking into account the comparatively less cost of the extension from Ibadan to Ilorin. The principal ethnical advantage of an extension to Ibadan as a terminus would be sentimental, ethnical if you like. The country up to Ilorin is Yoruba land; probably the major portion of the inhabitants of Ilorin are also Yoruba. From this point of view the extension from Ibadan to Ilorin is desirable. But it would not pay to run a train once a week between Ibadan and Ilorin were the hinterland supplied by another line. I therefore say emphatically that it is far better to have the terminus at Ibadan than to have it at Ilorin, I do not see how it could fail to upset the finances of this Colony were the terminus to be permanently at that town, situated as it is in a comparatively poor country with but little trade. I am aware that its population has been estimated at 70,000. I should think this an over estimate. It is a dull and lifeless place compared to our great towns. It may at first sight appear paradoxical when I tell you that I am most anxious that this Railway should be extended to Ilorin as soon as possible. It is because the sooner it gets there the sooner it will get to the Niger, and the sooner it reaches the Niger the earlier will be its arrival at the watershed of Lake Tchad.

[...]

POLITICAL ASPECT OF THE RAILWAY.

But the railway itself has also a political side. I presume you are all aware that France is likely to lead railway enterprise in this part of the world. You know of the project of the French railway from the Mediterranean to the bight between Tchad and the Niger. And you also know of the line starting from Porto Novo, which will doubtless be carried through the Dahomey hinterland to tap the same river. This will also be done higher up by the line from Konakry. If therefore we are to
keep our own trade, that is the trade of own more limited hinterland, can there be any better way of doing so than by extending this railway direct from Lagos to the Hausa capital? He would be a dull man that did not see that this line would be of enormous importance in developing and in keeping our own trade. Nothing else could so certainly keep it. For the purposes of defence against armed invasion this railway would be superior to any other. I maintain therefore that for the purposes of commerce and for the purposes of defence this railway would be clearly more advantageous than one starting from any other point on the British Coast.

**EFFECT OF THE EXTENSION ON LAGOS.**

Finally I wish you to consider what would be the result to this place of carrying our railway to the Hausa country. It is said that the territory in question supports some fifteen millions of inhabitants. There is evidence that it contains mineral wealth. If you look at a map of Africa you will see that no other single Colony has behind it a hinterland of equal value and promise. It would be all in vain to push this railway into that country were it a desert. But there we have a great country with numerous and industrious population. You should look on its trade as your heritage; and you should spare no efforts, shrink at no sacrifice, that would secure to you and your children's children, such a splendid possession. If you can only have this railway carried on, as I hope you may, the increase in the value of property here will be enormous: the careers opened out to your sons would be numerous: you would then obtain a degree of comfort and prosperity that you never dreamed of. The subject is however no dream. It is a scheme that is perfectly practicable if you push on the railway stage by stage, and never rest satisfied till your iron horse drinks of the waters of Tchad.

If you love your country, if you love your children and care for their future, let that be your aim. It is a legitimate aspiration which is attainable by the exercise of perseverance combined with wise and prudent management. I now ask you to drink prosperity to the Lagos-Ibadan section of this railway.

**Mr. R. KNIGHTS, Chief Resident Engineer, in responding said:—**

Your Excellency, Ladies and Gentlemen, — [...]  

In the construction of the Railway from Lagos to Ibadan there have been no great engineering difficulties with the exception of bridging the Lagoon here. We have had to contend with many things that were unforeseen, more especially in regard to the depth that the piles in many cases have been screwed down, amounting in several instances to over 40 feet lower than it was anticipated. Then the testing of the piles of the Railway Bridge was a difficult and dangerous operation, as in several of the piers, the piles sunk under the test load, in one as much as 13 feet. In all these the piles were again lengthened and screwed further down and re-tested.
I have heard it stated in Lagos that the Carter Bridge never would be built. Time however has altered that, as the Bridge was commenced in February 1898 and in the space of 20 months the last girder was placed in position. Some difficulties have had to be overcome here again in the sinking of piles in the most treacherous bottom of the Lagoon, but we are gradually becoming master of this difficulty and to-day, the Bridges and Railway to Ibadan are in a state of completion; and with the excellent work that has been done, no Engineer and his Staff need be anything else than proud of their work.

The greatest difficulty in Railway work upon the West Coast is however the deadly fever that decimates our European staff. Upon the work we hand over to-day, to Colonial Government, there have been 217 Europeans employed, out of these 29 have died and 31 have been invalided. This great cost in valuable lives makes one's wishes all the more sincere when to-day we hope and trust that the colony of Lagos has laid the foundation stone for the building up of a vast and mighty Colony.

In conclusion I would wish to thank my Staff for their noble support. No one can build a Railway, the Chief Resident Engineer must have the assistance of every one, and all pull together to bring a work of this magnitude to a successful completion,

I am proud to say, and it will give me the greatest pleasure to report to the Consulting Engineers, that the staff that has been employed has been most loyal and good fellows and I thank them for the way they have helped me, and that hand in hand we have brought the work thus far to a conclusion, we trust to the benefit of the Colony in every way.

Speech of Mr. E. J. Bailey, President of the Lagos Chamber of Commerce:–

Your Excellency, Chiefs, Ladies and Gentlemen, – It has devolved on me as President of the Chamber of Commerce, to represent however unworthily, the vast interests of the commercial community of this colony. It is only a few years since the Railway was not even talked of, and up to quite recently it took from three to fourteen days, according to the season to go to Abeokuta. The Government deserves the public thanks for having provided us with a Railway which will allow public and commercial intercourse between Lagos, Abeokuta and Ibadan in a few hours. It is also to be congratulated on being the first British West African Government to open a Railway of this extent of mileage.

Trade in this Colony has been extremely dull for some considerable time, worse I believe, during the last twelve months than it has ever been, and anything that tends to facilitate communication with the interior and thus enhance trade, cannot fail to be appreciated. I trust that His Excellency the Governor will do all in his power to encourage the natives to use the Railway, bearing in mind when
fixing the tariff, the cost of transit by waterway and the large bulk and little value of some of the produce. Although the Railway may not pay for itself for some years, with prohibitive rates it will never become a commercial success.

There is another point I should like to mention. We sometimes hear of petty troubles in the interior. With the advantage of the Railway His Excellency will be better able to investigate these.

Thus with the Railway in full swing and things working smoothly in the interior, I trust that the much needed improvement in trade will be consummated and that Government and Commerce working hand in hand for the benefit of this, the most important British Colony of west Africa, we shall see the commencement of a new era of prosperity, which will continue undiminished for many years to come.

Speech of Mr. C. A. Sapara Williams, B.L.

Your Excellency, Ladies and Gentlemen, – In the affairs of a community, like individuals, the whole view of a situation should be taken into consideration. We are called upon to-day to start a new life in our relations with the peace and prosperity of our country and fatherland. We are assembled to-day to inaugurate the opening of the railway which has been in the course of construction for sometime. How magnificent and stupendous is the work just completed we are here to-day to see for ourselves. A few years back who amongst us could have ventured to think of the possibility of linking together as we do now, our vast interior countries, so full of unexplored resources and commercial wealth. Of the difficulties of travel even to the nearest places very few are ignorant. How easy it is now to travel from one place to another. Their Majesties the Alake, the Oshile, the Olowu and the Alagura, without doubt, are convinced of this fact also. They will be home again to-day before the day is far spent. But this is not the only aspect of the situation that I wish to give prominence to. What we have to regard is, I say, the great impetus given to commerce in this undertaking. The iron-horse will open up to an inconceivable extent our hinterland, and places yet untapped and uncultivated, will yield fruits of abundant harvest which will be brought down by the trains during our various trading seasons.

Our country has, I am proud to say, not inaptly been designated the Liverpool of West Africa. Our trade, it is true, had in years gone by been hardly rivalled, but at present we are getting exhausted. We have the riches reserved for us by nature, but have not the means wherewith to take possession. Whatever will help to stimulate trade we most willingly welcome. The development of trade and the successful working of the railway will depend to a great extent upon the managerial care with which the Government adapts itself to our conditions as a race, and our methods of appreciation of new and foreign conditions.
of living. We are a people of simple habits. I sincerely hope that the Government
will not look upon this venture in the light of a trading concern, but will, for
our mutual benefit and from the standpoint of educator of the people adopt
tariffs not prohibitive in themselves but fair to our conditions and means. By
way of practical illustration we take the case of Senegal railway which extends
to, I believe, the Upper Niger. At the start, the people in those regions were tur-
bulent and intractable and were of a marauding disposition. It took the French
Government all they could do to reconcile them to the new conditions. But,
to-day, what do we see? By the extension of the line and the new life, and peace
and prosperity abound.

As Yorubas we are an industrial and agricultural people. The railway in every
civilized community is a great lever of commerce, and I doubt not that this rail-
way will turn out a success and will help in the improvement of Yorubaland. /

It is said that when the Olympian divinities wished to regale themselves they
turn their faces to the Aurora Borealis and betake themselves to the swarthy
Ethiopeans of the sunny south. This railway so far as we are concerned, may
be likened to the Olympian divinities, and surrounded in Lagos, as we are by
malarial swamps which no science can do away with, we too should sometimes,
during the unhealthy seasons, with the help of the railway, betake ourselves to
the healthy regions of the Interior, where sitting under our own vine and fig
we will be better able to study nature and improve our conditions. I hope this
undertaking will prove the truth of the adage that peace and commerce advance
side by side; and that to conciliate the people is to give them prosperity by open-
ing outlets for their commerce.

On behalf of the native inhabitants of Lagos I wish this undertaking every
success, and that every one in his own sphere will do his best to make it so.

[...]

Chief Aromire, on behalf of the White Cap Chiefs of Lagos, addressed the
assembly as follows: – We are thankful and appreciate very much what we see.
We had heard a good deal about the Oko Ile (railway) but had no idea of what
it was. It has pleased God however, by placing us under the rule of the late good
Queen, to enable us to realize what a railway means. We are very thankful to the
Governor for giving realization to this great undertaking. By means of the railway
Abeokuta which is distant three days journey can be reached now in four hours,
and Ibadan which occupied a journey of seven days can now be reached in one
day. The change means good and we are thankful for it. It is our hope that God
will bless His Majesty King Edward the VII, and make his reign long and prosper-
ous. We trust that as his late mother loved the African, His Majesty will follow
her example and love the African too. His Excellency the Governor is a fortunate
man in that the duty falls to him to perform the important task of opening the
railway which is so propitious for good. His Excellency knows his duty and does
Opening of the Lagos–Ibadan Railway for Traffic

it well. We will not forget his action in appointing Eleko to succeed the late Oyekan; neither will we forget what we have witnessed here to-day. The man to whom the privilege falls to open the railway is indeed a fortunate man.

[...

Mr. Olukolu, on behalf of the Native Guild of Traders, spoke as follows:
– May God bless the King and the Governor. The railway is a wonderful achievement, and we all are very much pleased and hope it will prove a great help. We are pleased because it will conduce to develop trade which is the life of the country. Both young and old are glad because of this, We trust that Providence will be with the Governor and help him to discover more products to increase trade and so help the people. We are all pleased at the prospect of the railway being opened for traffic.

The company then rose and His Excellency formally declared the Railway open.

At 1 p.m., the Alake and Members of the Egba Council who had entrained, departed for Abeokuta, and shortly after the Governor and a large number of persons started on a trip to Otta. The stations at Ebute Metta and Otta were all gaily decorated with flags and palms while pennons fluttered in the wind on every side. After a short stay at Otta, the train returned with the people back to Iddo where tea was served, after which the company separated and the unique function was brought to a close.

THE CEREMONY AT ABEOKUTA.

According to the programme, a train started early the following morning for Ibadan, conveying over six hundred persons to whom free passes were granted to enable them to be present at the opening ceremonies at Abeokuta and Ibadan. At 12 noon His Excellency the Governor and suite with a number of guests left Iddo Station for Aro. The train steamed into Aro Station at 415 p.m. His Excellency was met at the station by the Alake and Council, and an assembly of five thousand Egbas, with their Chieftains, and with drums and tomtons resounding. The Station was tastefully adorned with palms with flags flaying gaily, while an arch of palms gracefully set off the rail line under which the train passed as it came to a standstill; the fluttering of pennons everywhere denoted a gala day, éclat being added to the scene by the presence of an Hausa guard of honor. The Alake and Council entered the train and after bidding welcome to the Governor were introduced by him to his guests. The feasting of the people assembled was then began, and in numbers varying according as they were allocated, and from various points, there was evidence that the assembled crowd was doing justice to themselves. A shower of rain came on and somewhat interrupted the proceedings, but as there was plenty of shelter available, the people made themselves
comfortable while the drums kept up a loud and continuous tattoo affording enlivenment until nightfall. At 8.30 p.m. the company which included the Alake and Council sat down to dinner in the spacious carriage shed. / 

The Rt. Rev. Bishop Oluwole being called upon to speak, said: Your Excellency, and Gentlemen. The event which we are inaugurating this week will be an important land mark in the history of this country. Those of us who believe in the developing and civilizing power of the railway rejoice to see the Lagos-Ibadan section of the railway in this country an accomplished fact. The great benefit which it is expected to confer on trade by developing the resources of the country was dwelt upon at Iddo yesterday. It has developed other places, and the same result is looked for here. But I do not know whether opinion is really unanimous on this point; whether there is not fear in some minds that this giant that has appeared in the land might after all, prove destructive to trade. When it was an open question whether the railway should come to Abeokuta, one of the objections seriously put before me by an influential Egba was this: that the train takes so much at a time that it would soon exhaust the produce of the country. This objection which seems somewhat amusing in itself, bears upon an important point; it is a way of stating the fact that the railway makes an increasing demand upon industry for which there is as yet so much room in this country; as one goes up and down, from town to town, from village to village, and from hamlet to hamlet, one sees that even the natural products of our soil are not sufficiently collected; one sees that there is much room for cultivation. The railway also makes an increasing demand upon resources some of which have yet to be developed, and some to be discovered, Thus you see that it is a call upon us to multiply the number of producers who will labour hard; a call upon the patriotism of all the natives of this country; all classes, the clergy and schoolmasters, to guide those under their influence, and inculcate the dignity of labour: the wealthy and men of position, to use all the means in their power to use the development of our resources. There is also what a present day poet calls 'the white man's burden.' There is a burden in this respect for the white man. The Government of Lagos has begun to bear its share by the establishment of a Botanic Garden and by contemplating a Model Farm. I was pleased to read in a recent number of one of the local newspapers that Messrs Elder Dempster & Co., have undertaken to encourage cotton industry by promising a liberal prize to any one who should be the first to ship a certain quantity; I hope other firms will follow this good example and encourage industry in some way. But is it only material benefit we are to look for from this railway? May we not expect moral and spiritual benefits from this free and easy intercourse with one another? May we not hope for those influences which produce habits that ennoble a people – truth, honesty, purity and temperance? I pray for God's blessing on this railway. As it joins tribe to tribe and race to race, may it join them for peace and not for
war; for dealings of justice and mercy; for lawful and righteous commerce, and for whatever can elevate the whole man.

Hon. C. J. George, following, spoke as follows:– Your Excellency and Gentlemen: On an important occasion like the present, it behoves that I should express that satisfaction I feel at the happy issue to which the railway undertaking has been brought; and I am indeed very glad to witness the practical reality of a scheme which was but an idea a few years ago. We have to-day been conveyed in the space of four hours, a journey which in former times occupied three days by land and four days by water, and there can be no doubt that the facility thus created will be of great advantage to trade, and much benefit to the country generally. I congratulate His Excellency on his good fortune in being privileged to inaugurate the opening of the railway, and the circumstance deserves to be marked in some especial way so as to associate and perpetuate His Excellency’s name with the great undertaking. We have a Carter and Denton bridge in Lagos, and as a large bridge is now being constructed across the Ogun river at this point, it would be most appropriate if the bridge bore the name of the Governor.

[...]

THE INAUGURATION CEREMONY AT IBADAN.

Nothing could exceed the *eclat* and enthusiasm which characterized the ceremony of the opening of the railway for traffic at Ibadan. The train with the Governor and party started from Aro at 7.50 o’clock on the morning of the 5th instant, and arrived at Sanusi station at 8.35 a.m, Eruwa Road station at 9.20 and 20 minutes later at the beautiful site of Oloke Meji. Here the train stopped for some minutes, and the Governor and party descended from the train to observe the beautiful scenery. The strong bridge spanned the river at a height of about forty feet, the river coursing its way between the two hills from which the place takes its name and which rise to an elevation of 700 and 1000 feet respectively. It is here that the Government contemplate to locate the model farm, and it is hoped that in time a town will appear / on the side of the highest hill, and for which building materials of all sorts abound in profusion. The Governor and party having entered the train a start was again made and Ogunshile station reached at 10.15 and Adio station at 11.15 a.m. All the stations were tastefully decorated, the latter being embellished with beautiful wreaths of evergreen vines, and came in as a fitting prelude to the scene presented at Ibadan where the train arrived 11.58 a.m. As the train approached the Ibadan station a most gorgeous scene was presented. From every available point of the station flags and pennons flew gaily in the breeze, while trees of palms planted here and there, and festoons of palm branches artfully arranged imparted resplendency to the view. The background comprised a concourse of some forty thousand people,
grouped about, under the shady palms and around the many Chieftains, whose large and gaudy umbrellas harmonized with the variegated colours of the dress of the multitude, and who as soon as the iron horse made its appearance, could be seen moving *en masse* along the course of the road and they sent up a loud shout as the train entered the station. The Governor was met by the Resident Mr. F. C. Fuller, and was conducted by him to the group of Chiefs seated near by the station; the guard of honor of Hausa soldiers under Captain J. C. Ralph, presenting arms while the school children assembled sang the National Anthem, as the Governor passed, His Excellency advanced to the Bashorun and greeted him, and was heartily welcomed by the latter, His Excellency greeted the other Chiefs who were introduced by the Resident, and included the Aremo of Oyo, the Balogun, the Otun and Osi Bales, the representative of the Orogun of Ilia, the Bales of Ejigbo, Iragbeji, Ile-ogo, Ara, Igun Iresi, Shudunrin, and Ilawo; the Elerin of Erin, the Atawuja of Oshogbo, the Arigbajo of Igbojo, Olobu of Ilobu, the Timi of Ede, the Akirun of Ikorun, the Alada of Ada, the Bales of Fiditi, Apomu and Lalupon, the Aremo of Ogbonosho, the Aremo fo Oluwo, the Jagun of Oni-Ite, and Ogunshua Bale, of Modakeke. His Excellency, the Bashorun and the Chiefs having been invited into the station, His Excellency introduced the members of his party to the Bashorun. Shortly after, luncheon was served in the carriage shed at which the Bashorun was present while the crowd of people looked on and enjoyed the music of the Band. The party afterwards all repaired to the town, to witness the athletic sports which formed a part of the programme of the inauguration ceremony. Over four thousand people assembled in the open area near the Residency, to witness the sports which included running races, of various kinds. The most amusing of the sports we contest in which young girls competed in running matches with pots filled with water on their heads. One of the young lasses after allowing her pot to fall from her head and become smashed, rushed on to the winning post was much chagrined to find out that she was not to receive a prize. The sports passed off most pleasantly and as night came on there was an almost interminable line of people through the principle thoroughfare wending their way back to their homes.

The sound of the tomtoms early the next morning gave notice that the Bashorun and Chiefs were again on the move, and were about to start for the railway station to continue the programme of inauguration. At 9 o’clock the Governor with the Bashorun and Chiefs and large number of people, started on a trip up the line, and journeyed for a good distance, to the delight of the natives, and returned to the station at about 11 a.m. On the return of the Bashorun he was overwhelmed with greetings by his wives who stroked, patted and petted him and were effusive in their caresses. Shortly after the company partook of luncheon.

[...]

*Communications in Africa, 1880–1939: Volume 4*
State Ownership and Operation of Railways.

A DIGEST OF THE EVIDENCE GIVEN BEFORE A COMMISSION OF INQUIRY IN SOUTH AFRICA.

BY

SIR W. W. HOY,¹

General Manager of Railways and Harbours.

[...]

PART I.

In September, 1916, there was appointed by the Governor-General of the Union of South Africa a Commission whose function it was to be to inquire into and report upon (1) the advisability of State mining; (2) the financing, organisation and control of State mines, if such mines should be created, and (3) any legislative steps required.

[...]

Our special purpose, however, on the present occasion is not to discuss the pros and cons of the question of State mining, but to call attention to, and offer a digest of, some exceptionally interesting evidence given before the Commission by Sir William Wilson / Hoy, General Manager of Railways and Harbours for the Union of South Africa, on, among other subjects, the State ownership and operation of railways. The Commission had invited Sir William to give them information on the following points:
(1) The most suitable means of organising and controlling State mines, if inaugurated.
(2) The South African railways' experience as to the efficiency of official's and men in the railway services, as compared with men in private employ.
(3) The general efficiency of State railways, as compared with privately-owned railways.
(4) How best to secure the most capable officials and men for service on State mines.
(5) The desirability of inaugurating State collieries for supplying the railways and public services generally.
(6) Any general details which might be of use to the Commission. Information on these various points was supplied by Sir William Hoy in the form of a carefully drawn and most informative written statement; a series of appendices relating to railway conditions in various countries of the world, and oral testimony given by him before the Commission. The references to State ownership and operation of railways contained in the statement and appendices are well deserving of attention at a time when the future of railways alike in the United Kingdom and the countries of our Allies is already being regarded as a Question of the Day. We think, therefore, that it may be of interest to our readers and of service to the public at the present juncture if we give the following extracts from. Sir William Hoy's world-survey of State railways in principle and practice, though we do not necessarily concur in all the conclusions at which he arrives, while we would further remind our readers that many changes in the general conditions have taken place since Sir William Hoy made his statement in December, 1916.

In regard to South African experience as to the efficiency of officials and men in the railway service, as compared with private employ, Sir William says:– / they compare favourably with any similar body of men in any railway service or in any private organisation. The Union possesses a staff of railwaymen of which any country may be proud.

Nevertheless, South African experience indicates that certain disadvantages attach to State services, and that much of the time and energy of the staff are taken up with matters with which no private management would be required to deal.

Staff control and discipline in a State concern are so bound up by regulations as to create greater difficulties in handling the staff than are experienced under private management – vide the experience of Belgium, where it is said

that political considerations have so entered into discipline matters that heads of departments prefer to shut their eyes to many faults rather than risk having punishments they inflict cancelled by the intervention of politicians.

It is difficult under a semi-judicial system efficiently to control a large body of men of different grades, such as is employed in a railway service. The service, and discipline regulations on the South African railways are elaborate and cumbersome. While there are excellent motives behind these regulations in the direction of preventing injustice and ensuring impartial consideration of discipline cases, I am satisfied that fair treatment can be secured to the staff without such elaboration.

In large private railways there is practically, the same stability of employment as on a State railway, except that anything in the nature of ‘slacking’ is liable to result in dismissal. In State concerns, however, it is not easy to deal with the man who, while not doing an honest day’s work, carefully steers a course which just keeps him within the regulations. This class of man is fortunately small, and will be found in any concern, but he is better able to indulge his bent in a State than in a private organisation. In short, there is not in State concerns the same elasticity in the control of staff as in private organisations.

On the other hand, with regard to promotion and reward for good work, considerations of seniority play a greater part in a State than in a private concern in governing promotion. A private manager can promote a capable man without regard to seniority; but a State concern has to step guardedly in such matters. It is extremely difficult to demonstrate in concrete fashion that one particular man is more efficient than another, however superior he may be. If seniority be made the sole factor in determining promotion one of the main incentives to efficiency disappears, and the service suffers accordingly. Fortunately, the statutory provisions governing promotion on the South African railways prescribe that preference shall be given to the efficient. On private railways some appointments and promotions are the result of patronage, and even favouritism, and I consider that in the Union railway service an able man has opportunities quite as good as, if not better than, he would have in private employ.

There is a regrettable tendency for individuals in State employ to bring Parliamentary influence to bear in regard to alleged grievances; and in this they are frequently encouraged by legislators anxious to make political capital out of such cases. Minor complaints are, therefore, frequently debated in Parliament purely on political grounds. It is obviously impracticable and undesirable for the machinery of Parliament to be utilised to perform the functions of Appeal Boards already in existence. Parliament has not the time, even if it did have the complete evidence, to do justice either to the men or to the Administration.

The same applies to many other details which, on a private railway, would not be considered sufficiently important to place before the general manager.
Matters, in themselves trifling, assume unwarranted importance by reason of their entry into the arena of politics, and thus occupy much of the time of the principal executive officers which should be devoted to constructive work.

Moreover, undue influence on the executive authority is attended with a broader disability, in that it operates against adequate decentralisation – the essence of efficient organisation. /  

PART II. 

THE GENERAL EFFICIENCY OF STATE RAILWAYS AS COMPARED WITH PRIVATELY-OWNED RAILWAYS.

This is a highly complex problem, involving innumerable considerations, and it is not possible in this evidence to do more than very briefly indicate the main considerations involved.

What constitutes efficiency in railway management? – Considerable vagueness frequently exists as to what actually constitutes efficiency in railway management. It is misleading to judge a railway’s efficiency by particular details, and I conceive that such must be determined by the following broad considerations, viz.:–

(a) the maximum possible development of agricultural, industrial and commercial activity by means of cheap and well designed tariffs, and by efficient and expeditious service;

(b) the full development of passenger traffic by means of cheap fares, comfort and speed of travelling.

The principal means of ensuring relatively cheap railway transport is by economical construction, maintenance and general working. Waste or extravagance in capital or current costs ultimately results in higher traffic. Increased railway traffic diminish traffic and retard industrial development.

Much also depends on the general efficiency of the service provided, and on the manner in which the tariffs are designed with relation to different classes of traffic. Increased traffic decreases the expenditure per unit. Badly designed traffic diminish the volume of traffic, which involves increasing tariffs on the remaining traffic, for the reason that a decrease in traffic increases the expenditure per unit. Operating expenses do not diminish in the same ratio as traffic, owing to the large proportion of ‘fixed’ charges included in railway costs.

Conflict of informed opinion on relative advantages of State versus private railways. – There is much room for diversity of opinion as to the relative advantages of State versus private railways. So much depends on the peculiar conditions of the country concerned. Prior to 1885 Italy alternated between State and private management. In 1885 she definitely changed from State to private / manage-
ment, and in 1905 reverted to State management. In 1844 the British Parliament passed an Act dealing with the State purchase of the railways sanctioned subsequent to 1843, and in 1865 the British Royal Commission reported in favour of the continuance of private management. Japan, after experience of private and State railways side by side, decided to nationalise the whole of her railways.

[...]

Difficulty of instituting reliable statistical comparisons of results of working State and private railways. – It is extremely difficult, if at all practicable, to secure reliable concrete comparisons of the actual results of working State versus private railways. Large profits are possible under wasteful management if favourable conditions exist, e.g., dense traffic and satisfactory grades and curves. On the other hand, small profits, or even no profits, may be earned by a highly efficient railway unfavourably situated with regard to traffic, grades and curves, and costs of labour and materials. No railway unit of expenditure or revenue gives a reliable comparison between one railway and another, as so much depends upon:

(a) costs of fuel, material and labour;
(b) physical character of country, which determines train loads;
(c) density and nature of traffic;
(d) average length of haul;
(e) industrial and railway policy;
(f) competition with alternative means of transport; particularly water transport; and
(g) different values of money in different countries. Most railway authorities are agreed on this point. /

PART III.
ADVANTAGES AND DISADVANTAGES OF STATE CONTROL OF RAILWAYS.

Although it is not possible to form definite conclusions from a statistical analysis of State and private railways, practical experience indicates certain broad advantages and disadvantages attaching to both systems. A brief summary of the position, as it appeals to me, is as follows:

The Main Advantages of State Control.

(a) Railways administered by impartial authority. – The railways of a country are of common concern to all interests in a community. Railway tariffs can be designed so as to develop and encourage certain interests, and to retard or even stifle others. This applies in any country, but in South Africa, owing to the peculiar conditions prevailing, the great distances between producing and consuming points, between ports and interior, and other circumstances, the rail-
way tariffs are probably as important as the Customs tariffs in determining the development of agriculture, industry and commerce. That being so, it is desirable that the fixing of railway tariffs should be in the hands of an impartial authority. In Great Britain and America the railways are prohibited from discriminating in tariffs in favour of particular firms or individuals; but this is not enough to ensure the tariff being designed in the best interests of the State.

(b) **Tariffs on State railways can be designed to harmonise with policy of national development** – Railway tariffs on State lines can more readily be adjusted in harmony with the policy of national development.

Germany’s low export railway tariffs and low through rates from the interior of Germany to foreign ports have undoubtedly been an important factor contributing to the hold she had secured on foreign trade; and it is difficult to resist the view that the State railways of Germany have done more to foster agriculture, industry and exports than any private railways. Germany’s railway policy was framed to assist to the fullest extent in the achievement of her national ambitions. / By means of very low rates, some of which have been criticised (wrongly) as unpayable, the railways of South Africa have developed a relatively large trade in shipment coal, export grain and fruit.

(c) **State better able to finance railways.** – A State can secure money more readily, and at lower interest, than a private company. It is in a better position to finance its railways, not only as regards construction, but in the matter of renewals and improvements in track and equipment. Owing to difficulties in obtaining funds for betterment and upkeep, and to other causes, 41 American railways, with a track of nearly 42,000 miles, were in the hands of the Receivers early in the present year (1916).

Improvements designed to produce economy in operation are constantly necessary on a railway, in order to counteract the steady and universal increase in working costs.

(d) **Profits of State railways are secured for the benefit of the State.** – Under State railways the profits are secured for the benefit of the State. The South African policy, in accordance with the Act of Union, is not to make the railways profit earning. The net profits of the German railways in 1912 were £53,623,000, equal to 6.13 percent, on the capital cost. Taking interest on capital at 3 1/2 per cent., the net profit remaining is in the neighbourhood of £24,000,000. The *sufficient to pay interest at 3 1/2 per cent. on a debt of £685,000,000.* The average rate per ton-mile in Germany in 1912 was less than two-thirds of a penny, with an average haul of 61.8 miles. The average fare per passenger-mile was 45d., less than 1/2d. per mile, the average journey per passenger being 14 1/4 miles. This certainly does not point to high tariffs.
(e) Location of railways better if controlled by State. – The location of railways is a science, and the general design and distribution of a country’s railways should be better, and waste avoided if the work were controlled by a central authority. On the other hand, Australia and other countries afford examples of badly located State railways resulting from undue political pressure.

The military aspect in regard to the location of railways needs no demonstration. It has been strikingly brought home in the present war, and by Lord Kitchener’s report on the defences of Australia.

(f) Construction of lines to open up new country. – A danger exists under private ownership for rich districts to be surfeited with railways, and for undeveloped and remote districts to be badly served. Private enterprise cannot be expected to sink capital in undeveloped or remote districts when a profit is problematical, whereas a State builds railways, irrespective of immediate financial results, in order to develop the country. Canada is perhaps a notable exception, but there the State has aided private companies in developmental work. Many of the branch railways in South Africa would not have been constructed by private enterprise. Regarded as separate railway units, many of them at the commencement were unprofitable; but this consideration is outweighed by the traffic they bring to the main lines, and by the stimulus they impart to the opening up and development of remote districts. In 1912 nearly 2,000,000 tons of public traffic, or 15 per cent., of the total conveyed over the South African railways, emanated from branch lines. The tonnage from branch lines has increased considerably since 1912; but later statistics are not readily available on account of the number of men on active service.

Railways are the pioneers of civilisation in the great waste spaces of the world, and many pioneer railways would never be built except by the State or with State assistance.

(g) Co-operation with other Government Departments. – The administration of a State railway works in co-operation with the great industrial departments of the State in a manner that is impossible to a large number of private railways. Moreover, by its concentration of effort and policy, it is possible for a State railway, properly organised, to do more to foster development than private railways with conflicting interests.

(h) Private railways pre-occupied with conflicting interests. State railways concentrated on State development. – Prior to Union the managements of the three State railways of South Africa spent a considerable portion of their time in discussing and adjusting conflicting interests. There was strong evidence of this conflict of interests in their respective tariff systems. Now that one central authority exists it has the power to decide and act promptly according to the best interests of the Union as a whole. The administration of the Union railways is, therefore, concen-
trated upon development, and a large amount, not merely of waste energy, but of actual stoppage of necessary reforms has disappeared. What happened with three railway administrations in South Africa must clearly occur in an even more pronounced degree where a large number of private competitive railways exist.

(i) Duplication, overlapping and waste resulting from excessive competition amongst private railways. – There is a good deal of duplication, overlapping and waste resulting from competitive private railways. A brief outline of some of the causes is as follows:–

(i) The number of conflicting organisations which tend to higher working costs than are necessary under a central organisation.

(ii) The overlapping and duplication consequent upon the undue multiplication in same town of stations, buildings, depôts, cartage plant, staffs, &c. 

(This is overcome in some instances by the creation of joint companies under separate management. [...]) There are also cases in Great Britain of stations being worked by joint companies – Perth and Carlisle, for example. [...]

(iii) The multiplying of facilities to attract traffic from competitors, e.g. –

(a) Trucks are frequently conveyed direct to destination, for competitive reasons, with very small loads. This involves considerable waste in train mileage and unnecessary expenditure in rolling-stock and operation.

(b) Passenger trains are run between the same points over competitive lines at the same times.

(iv) The separate ownership of the wagon supply:–

Owing to the practice of promptly returning other companies stock to owners, to obviate demurrage charges, inadequate use is made of such stock on return journeys.

Industrial companies’ private wagons, which bear a large proportion to the total, must be promptly returned to particular sending stations, with the result that there is little opportunity for securing loads.

Considerable expenditure involved in shunting and separation of stock of different owners, including provision of extensive marshalling yards and sidings.

Note. – The remarks under this paragraph refer more particularly to Great Britain, though in Holland there is competition, and all the waste that this implies, between the companies working State-owned lines. /

(j) Relative business enterprise of State and private managements. – it is frequently asserted that a State management is inferior in business enterprise to a private management. Although much evidence supports this view, there are many examples that do not. In South Africa it was the State, not private enterprise, that initiated the export grain and fruit trade. [...]


PART IV.
THE MAIN DISADVANTAGES OF STATE CONTROL.

(a) The practical experience of State ownership in different countries demonstrates that it is attended with powerful disadvantages. As to how far the disappointing results have been due to the peculiar local conditions of the countries concerned, to what extent they were preventable, whether equally powerful evils in other directions would have occurred under private ownership, I am not prepared to say. The results plainly indicate that, unless adequate safeguards are devised, grave abuses and disadvantages attach to State ownership.

(b) Experience of other countries:— [...]

(c) Exercise of undue political influence on management with regard to staff conditions, tariffs and general facilities. – Where a large body of men, such as a railway staff, is employed directly by the State, there is a danger of their enlisting the efforts of legislators to secure better wages, shorter hours, improved conditions, &c. It is undoubtedly desirable that the general conditions of the staff should be on a reasonable and just basis, but it is radically unsound that, in a large organisation like a State railway, undue Parliamentary influence should be brought to bear on the executive authority controlling the railways. The enforcement on the management by Parliamentary influences, of changes in staff conditions, demoralises the entire railway service, impairs discipline, prevents good relations between the staff and the management, destroys economical working, and in every way is to be gravely deplored.

(d) Employees resort to political influences. – There is a tendency on State railways for individual employees who feel aggrieved to resort to political influence. The results are harmful alike to employees and management. Efficiency and economy are in the interest of the employees, as waste, extravagance and inefficiency diminish railway profits, and this ultimately reacts on the staff. Economical and efficient working soon disappear if the authority and discipline of the management are undermined by undue external influences.

(e) Position in Australia. [...]

(f) Results of political interference in other lands. [...]

(g) German railways free from political influence. [...]

(i) How difficulties can be mitigated if not overcome. – Much can be done to minimise the disadvantages resulting from political interference. I do not suggest that Parliament should abandon the power of control in matters of high policy – that is neither practicable nor desirable – but I am strongly of opinion that the management should be absolutely free from interference or undue influence in the
The more absolute the power of the executive authority in matters of appointment, promotion, grading and discipline of staff, the more efficient will the staff be.

(j) Tendency to over-centralisation and rigid uniformity on State railways. – There is undoubtedly a tendency towards over-centralisation and rigid uniformity on State railways, and also of excessive rigidity in matters of audit-supervision of expenditure, contracts and revenue. These elements result from the necessity for great scrupulousness on the part of a Government to avoid the possibility of suspicion of partiality or abuse. My own view is that these restrictions are carried too far. Over-centralisation destroys initiative and resource, and, if carried to excess, tends to cripple a large organisation. There is nothing inherent in State organisation to prevent adequate de-centralisation, but the tendency certainly is towards over-centralisation.

PART V.
GENERAL CONCLUSIONS.

The United States private railways, on the average, have the lowest transportation tariffs in the world – a fact partially due to the long hauls on their railways, and also to the aptitude of the Americans in general business enterprise. The British railways possess features of efficiency, particularly in maintenance, speed safety and smooth operation, which compare favourably with any railway. The German railways can also point to peculiar advantages. The part German railways have played in the present war indicates wonderful efficiency and organisation on the operating side, and German industrial development testifies to the soundness of her general railway policy.

Regarded from a purely business standpoint, it would be difficult to achieve better results than are attained by many of the principal private railways, but, as has been indicated, vital importance attaches to the broader aspect of securing the maximum national development.

The wide conflict of practical evidence renders it extremely difficult to decide as to the relative advantages and disadvantages of State and private railways. On the whole, it would seem that the problem is one to be determined according to the geographical position and the industrial, economic, political and social conditions of the particular country concerned, rather than according to the merits claimed for either system in other countries.

The success or otherwise of State railways is influenced largely by the extent to which the management is freed from political influence. It is thus manifest that the problem is governed by many elements other than the purely economic.
After mature consideration of the problem in all its aspects, I am inclined to the view that railways should be laid out, constructed and owned by the State and that with regard to the working, they should either be leased to a private concern, subject to adequate control as to the general tariff policy, &c., as in Holland or India, or matters of policy should be so divorced from executive / control that State management would be freed from interference, political or otherwise, and afforded the same facilities for efficient working as a private company.

Experience shows that politics do creep into all State managements – irrespective of the statutory or other safeguards applied, as in the case of Australia and Italy – and that the only managements immune from interference are the autocracies of Germany and Hungary. While the German system is no doubt too drastic, it has much to commend it as a means of fostering that national development so specially necessary in a new country like South Africa where agriculture and industries require every possible stimulus. What is wanted is some compromise between the two extremes, and I think one could be found.

No difficulty should be experienced in effectually separating policy from management as is done in the operation of the Vryburg-Bulawayo section of the Rhodesian railways. The company lays down the policy, and the S.A.R., by whom the line is worked, is not interfered with in details of management. Neither do politics intervene.

The system of control suggested embraces all the advantages of State ownership and eliminates the disabilities which usually attend State management.

Conclusions With Regard To South Africa.

Subject to what is stated in the last preceding paragraphs in regard to the elimination of interference in management, I am satisfied, having regard to local conditions and experience, that South Africa can best develop its resources and build up a sound national prosperity by having its railways under State control.

The outstanding features of South African conditions affecting railways are:—

(a) The small population in relation to area.
(b) The great distances between —
   (1) chief industrial centres and coast;
   (2) principal centres of population;
   (3) producing and consuming areas.
(c) The absence of canals or navigable waterways.
(d) The vast tracts of undeveloped territory which railways must traverse to reach their objectives.

Private construction served useful purpose. – In South Africa, as elsewhere, private construction has no doubt served a useful purpose, but, broadly speaking,
the operation of railways in South Africa by private companies cannot be said to have been a success. South African conditions are not, however, altogether favourable to the conduct of railways by private enterprise.

**Position of Union railways.** – The Union railways are administered in terms of the South African Act, 1909. The Act prescribes that all profits, after providing for payment of interest, depreciation and betterments, are to be utilised in the reduction of tariffs, due regard being had to agricultural and industrial development within the Union and the promotion by means of cheap transport of the settlement of an agricultural and industrial population in the inland portions of the Union.

Another very important provision in the Act of Union is, that if the railways are required to provide any services or facilities either gratuitously or at an unpayable rate, the loss thereby incurred must, after approval by the auditor, be paid out of consolidated revenue to the railway and harbour fund.

These statutory provisions testify to the far-sighted policy of the framers of the Act of Union and their full effect is perhaps greater than is generally realised. Not only do they remove the danger of the railways being used as an instrument for taxation, but taken together, they minimise to a considerable extent the possibility of railway policy and details of railway management being subordinated to expediency, and at the same time limit the scope for drastic changes in railway policy resulting from changes in government.

**Elimination of provincial control.** – In the elimination of provincial control the South African railways also have a material advantage, say, over the railways in Australia, Canada and the United States. In the United States there are over 40 State legislatures, each wielding extensive powers of control. Each has a separate Railway Commission which imposes conditions and regulations in its own State, while the Inter-State Commerce Commission controls inter-State traffic. This multiplicity of authority has caused much confusion, and rulings have been given which militate against the granting of low competitive rates. The excessive control of these different authorities is undoubtedly pressing severely on the companies. In Canada, employees injured in one State, though belonging to the same company and employed in the same grade, are governed by different laws, with regard to compensation, to employees injured in another State. In Australia the disadvantages of separate State ownership are exemplified in the different gauges – a serious obstacle to railway progress. Hitherto there has been no rail communication between several of the States, but inter-State lines are now under construction by the Commonwealth Government. This introduces another railway authority, and tends further to complicate the position.

**Rates reductions.** – Since Union, reductions in tariffs have been made, estimated to involve a surrender of revenue approximating one and a half million
sterling per annum. Many minor reductions have also been made, the exact financial results of which are not known.

_Broad features of S.A.R. policy._ – The broad features of the tariff policy of the South African railways are low rates for exports, raw materials for manufacture, agricultural produce, minerals and other raw products of the country, with a view to stimulating agricultural and industrial development. Especially low rates are granted for long distance traffic, the flat and tapering rates principles having been largely adopted. Passenger fares have been substantially reduced, particularly for suburban and long distance traffic, and low excursion fares are frequently available, these being supplemented by a vigorous advertising programme. Internal commercial development has also been stimulated by low ‘distribution’ rates, designed to afford inland traders equality of opportunity, as regards railway tariffs, in competing with coastal merchants for the interior trade. / [...]
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No. 94.
LAGOS.
Governor Sir W. MACGREGOR\textsuperscript{1} to Mr. LYTTELTON.\textsuperscript{2}
(Received January 28, 1904.)
(No. 16.)
(Extract.)
Government House, Lagos, January 9, 1904.

I have the honour to forward herewith copies of two reports I have received from Mr. Glasier, General Manager of the Railway, prepared by two officers sent out by him to look for means of increasing traffic on the railway.

2. It should be noticed that Mr. Allen in his report, page 1, states that one reason why palm oil and kernels are not carried in greater quantity to Ibadan is excessive tolls.

This reason will now totally disappear.

In your telegram of the 8th instant,\textsuperscript{*} you have sanctioned the abolition of all export tolls. This strikes at the root of the question of tolls as regards all exports of native produce of every kind, and very greatly simplifies the whole question.

\textsuperscript{*} 497: not printed.
Enclosure 1 in No. 94.


Notes:–

Olodo. – This is not a town, but a market place.

Lalupon, Sakuru, Offa Igbo. – Are small villages on route surveyed (eastern). All abound in palm trees.

Iwo. – This is the first town of considerable size and population after leaving Ibadan, and by the immediate extension of the Railway to this place the bulk of kernels going by road through Apomu will be tapped. The routes from Ile, Igbo, Kuta, Ede, Oshogbo, Ikirun, Inisha, Okuku, Erin, and several other towns converged to this town, also the towns of Ilibu, Aragberi, Ejigbo, Ilagbeji, Ifon, all palm trees district, not on the direct road but not far distant across will find their way to Iwo. Even the town of Ikirun is nearer to Iwo than to Ibadan (not more than seven hours).

Offa Proper. – I found on arrival there is, under the Government of Northern Nigeria, no palm trees there. Ikirun and Oshogbo supply Offa Proper, Ilorin, and towns beyond with palm oil for home consumption. After leaving Ikirun palm trees grow sparsely and almost disappear before reaching Offa Proper.

At Iwo, Ede, Oshogbo, Ikirun, I tried to find out the reason why palm oil and kernels are not carried to Ibadan as hitherto, and the three following are reasons given:–

1st. Excessive tolls.
2nd. Reduction price causing loss.
3rd. Marrying season.

I told the principal men in every town that the tolls they complain of have been removed, and as to prices, if they prepare their kernels properly and quite free from shells, they will be paid good prices.

The general marrying season at the aforementioned towns opens annually between October and closes in November or early in December. This is a custom followed at these places and adjacent towns, and occupies three moons, or a little over two months. My mode of addressing the people is to first arouse their interest by painting the advantages to be derived from the Railway, and then conclude that if they do not show that they are industrious by carrying kernels to Ibadan in large quantities as hitherto the white man will not be stimulated to extend the Railway in their / direction soon. All the towns through which I passed are anxious that the Railway be extended in their direction, and promised to commence carrying kernels to Ibadan. I am informed that the supply of kernels is increasing some days since.
Retracing my steps from Offa Proper I passed through Ikirun and got to Ogbomosho, and as I must reach Ikerre and Apomu I enquired whether there is any route across country to Ilesha, and was told there was one, and as Magaji has never travelled in that part of the country, I got a man to lead us part of the way, and he accompanied us as far as River Oshun Ajigun and returned to his town. We crossed the river and entered Ijesha land at Oke Bode, a small village, and Ila Oko, and proceeded to Ilesha. On my arrival at Ilesha I immediately waited upon the Owa, who seemed very anxious that the Railway should be extended in the direction of his town.

The Owa complained that his people carrying kernels to Ibadan and Ejirin have had to pay tolls at 11 places – five strings of cowries at each place – and reckoning that amount with the carriage, four to five days, it does not tend to their advantage. I then replied that I am informed that the tolls have been abolished. I urged him to encourage his people to prepare and take kernels to Ibadan, and that he must also tell them to plant cotton as the whiteman likes cotton too. The Owa replied that some Oginbos have spoken to him about cotton, and that the thing which at present discourages the Ijesha and Ekitis is the tolls. I repeated that I heard that tolls have been abolished. The Owa said he would send and call his chiefs and elders to meet me to-morrow, and that I should tell them all that I said to him. On Saturday, the 20th December, 1903, at 9.0 a.m., the Owa sent to call me, and to say that his chiefs and elders are waiting. I went at once, and found the Owa and his principal men waiting. The Owa then said to me 'Please repeat what you told me yesterday', and I did so. The Odole, one of his principal chiefs, started again with the same story about tolls, and I repeated my reply that I am informed tolls have been abolished. The Owa at once ordered his town crier to ring the bell round the town in the evening, telling his people to begin to carry palm kernels to Ibadan and in large quantities. I have every reason to believe that the people have begun the kernel trade to Ibadan in earnest, as I am informed by a kernel buyer that the supply is now increasing. The Owa was very anxious in expressing that he hopes his people will be freely permitted to carry their produce to the merchants direct, and that they may be under no restrictions, i.e., that there be no compulsion to sell to middlemen.

I promised him that I shall report to the Railway Authorities and he thanked me.

On leaving Ilesha on the 21st December I met lots of Ijesha people returning from Ejirin, and spoke with nearly everyone. I found that most of them went with cash, and did not carry kernels in order to avoid paying tolls.

I told them that tolls have been abolished, and that they should be taking kernels to Ibadan, and nearly every one promised to commence doing so.

On my arrival at Modakeke on the evening of the 21st December, I went straight to the King’s house, but could not see him as he was out visiting. On the morning of the 22nd, I called on him, and found some of the principal men
of his town with him. I urged him to encourage his people to prepare and carry oil and kernels to Ibadan, and he commenced the story about too much tolls. I told him that tolls have been abolished. He then said that the Oni of Ife is still collecting tolls at Iremo gate. I went to Ife, which is about 30 minutes’ walk from Modakeke, I could not see the Oni: he sent to tell me that he would have been glad to see me, but is sorry that he has entered the seven days’ custom of his country, during which he is not to be seen.

I sent to tell him through his messenger that I am not on political mission, but am travelling to encourage people in matters of trade. He sent to say that he is encouraging trade, and that there are lots of palm oil and kernels in his town. I then enquired whether it is true that he is collecting tolls at Iremo Gate. His messenger said it is true, and that he has His Excellency the Governor’s sanction to do so. He receives five strings on every bag of kernels, five strings on every case of gin, and 3d. on every box or case containing goods.

I visited Modakeke Market in the evening, and saw there kernels of very fine quality. The present rate at which the people buy palm kernels at Modakeke Market is 30 strings to 35 strings basket measure, about 15 lbs., or 2s. 6d. per 90 to 100 lbs., but carriage to Ibadan is 2s. per load.

From Modakeke I came to Ashipa, crossed Shasha Stream, and arrived at Gbangan. I am informed by a trader at Gbangan that there is a road across to Iwo, which will occupy about eight hours to get there, and the people will be glad of any means by which the distance to carry loads will be considerably lessened.

From Gbangan I came to Ikire. At Ikire I got the same story about tolls, and I told them as I did at all towns which I passed through that tolls have been abolished, then they mentioned that they have to pay tolls at Apomu. I left Ikire at 7.30, on the 25th, and arrived at Apomu at 8.0 o’clock. I found an officer of the Ibadan Government there, who told me he is collecting tolls at five strings per load going either to Ibadan or Ejirin. I crossed Oshun River at 9.25 (this is said to be the confluence of Oshun River, Oba River and Erinle River), I entered Ibadan 4.0 p.m.

From Ibadan to Ikirun may be said to be one vast forest of palm trees and Ijesha land, Ekiti land, to Ibadan the same may be said without exaggeration.

On Monday, the 28th December, 1903, I started from railhead, and found a very good road being laid out from station to railway. This road goes along track pointed out by Magaji as being surveyed by Mr. Gee, and if the extension be made parallel, or near this road, it will run between the Residency and the Barracks, and by a curve hit the road to Iwo. I reckon the distance from Ibadan to Iwo to be about 30 miles, but considering the windings and turnings of native footpaths, the distance professionally laid out may be less by six to eight miles.

Wm. A. Allen,
Station Master,
Abeokuta.
Governor Sir W. MacGregor to Mr. Lyttelton

Enclosure 2 in No. 94.
LAGOS GOVERNMENT RAILWAY.

Sir,

Ebute Metta, December 15, 1903.

I have the honour to inform you that, in accordance with your instructions I have visited the principal kernel districts in the neighbourhood of Ibadan, and have made enquiries with regard to the markets at which the kernels are sold, and the routes by which they are taken to these markets.

1. I learnt, by enquiries in Ibadan, that tolls are not collected at the gates on kernels brought into the town, but the tolls are paid by the merchants when despatching kernels to the railway. The tolls, therefore, contribute to a certain extent to the low price paid for kernels this year, as the price received by the seller is naturally less, by the amounts of the toll, than it would be were the tolls not in force.

2. I left Ibadan on the Ijebu Ode Road, and proceeded to the village of Odo Ona Kekeri. On the road I passed a large number of caravans returning from Ejirin Market, and found, on enquiry, that they had originally started from Ibadan, or from the districts of Iwo, Oyo, or Ogbonosho. They had either taken money to Ejirin to buy goods, or had carried native soap, native cloth, Egusi, pepper, sheep, or goats. I did not find any who had carried down palm kernels.

At Odo Ona Kekeri I learnt from the Bale and villagers that there were not many kernels in that district, that the crop was poor this year, and that the kernels are bought by native traders who come from Ibadan.

At Lanisa Farm, about two miles from Odo Ona Kekeri, there were a considerable quantity of kernels lying on the ground, but, owing to the low price to be obtained this year at Ibadan, the owner had sold them to a soap maker. A black oil is obtained by heating the kernels (after shelling) over a fire, and this is used in the manufacture of native soap.

At other farms upon this road the owners informed me that their kernels were always sold to traders from Ibadan.

At Orilode, a village near the River Ona, I only saw a very small quantity of kernels, the Bale informed me that it was too early in the season. The kernels in this district are bought by native traders from Ibadan, and none are taken to Ejirin the distance being too great.

The depth of the River Ona at this point is about two feet six inches, but there is no canoe traffic.

3. After returning to Ibadan, I proceeded in an easterly direction towards the town of Apomu. Between Ibadan and the River Oshun I passed a number of rest-houses or small markets – Alagbede, Olode, Adegbaye, Ohan Adekanbi,
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and Ideomo. / The women at these places say that, in former years, people from the Ilesha, Ife, Modakeke, and Ikiri districts were accustomed to bring their kernels to these markets for sale, but that this year, this traffic has almost ceased. At Olode Market, a large part of the ground formerly occupied by the kernel traders has been planted with maize, owing to the falling-off in the trade.

This decrease is due to the low price paid for kernels at Ibadan this year, the price being insufficient to induce the people to carry their kernels any distance.

The kernels in this district are all sold in Ibadan. The crop in some places was said to be not as good as last year, and it was stated that, as a general rule, good and bad year alternate, the crop being good one year and poor the next. This appears to be a general opinion in the neighbourhood of Ibadan, and was the reason always given in the districts in which the crop was said to be poor.

4. At Osungere, a large farm village near the River Oshun, there were a considerable number of kernels lying on the ground in shell, but no cracking going on. The people this year pick the nuts principally for the sake of the palm oil, and after obtaining this they keep the kernels in the hope of an improvement in the price. I am informed that kernels in the shell will keep without much deterioration for three years.

At Awaye, another large farm village near Osungere, I found quantities of kernels in shell, lying on the ground or stored in baskets and pots. In only one house was any kernel-cracking being done, but the Bale informed me that at this time last year everyone in the village was busy kernel cracking. The price obtained this year is too low to offer any encouragement to the people, so that either the nuts are left on the trees, or, after picking and extraction of palm oil, the kernels are kept in the shell. Those farmers who need money sell a few kernels, but those who can afford to wait for a better price keep them. No kernels from this district are taken to Ejiri, the distance being too great: they are either sold at Ibadan, or at Olodo, a market on the Iwo Road. In the latter case they would subsequently be taken to Ibadan.

5. After leaving Osungere I crossed the River Oshun. This river is not navigable for canoes, owing to the rapids and cataracts. The ferryman at this point states that there is a great decrease this year in the number of people coming with kernels from Ilesha, Modakeke, &c., to Ibadan.

6. Apomu, a town about one hour’s journey from the River Oshun, is at the head of one of the principal roads from the northern part of the Colony to Ejiri; the other road runs from Ibadan, meeting the road from Apomu near Ijebu Ode.

This town (Apomu) is in Ibadan country, and tolls are collected from all persons passing through with loads, except those coming from Ibadan who have already paid the tolls there. The new tariff, which has been in force about a
Governor Sir W. MacGregor to Mr. Lyttelton

37

month, is the same as that in use at Ibadan, the rate per kernels being five strings per load (about 3/4d.). Before the introduction of a proper tariff the toll was 1d. per load, but was not strictly enforced. The collection of tolls at Apomu appears to inflict a certain amount of hardship upon persons passing through with kernels, and subsequently selling them at Ibadan, as after paying the tolls at Apomu they would still be subject to the reduction in price made by the merchants on account of the tolls at Ibadan (see paragraph 1).

Enquiries in this town, and an examination of the customs books, showed that the great majority of persons passing through this town with kernels took them to Ibadan, and only a small number to Ejirin. Caravans to Ejirin pass through once in eight days, and the customs books showed that on the dates, November 23rd to November 30th, 1903, inclusive 200 loads of kernels passed through Ibadan, and only 15 loads for Ejirin. There is, however, a considerable amount of traffic, other than kernels traffic, going to Ejirin market, principally native soap, cloth, egusi, sheep, and goats. The caravans return with gin, rum, cloth, salt, cutlery, &c. On November 24th to 26th, 1903, being days on which the caravans were returning from Ejirin market, the quantity of gin, rum, salt, and cloth passing through from Ejirin to towns in the hinterland was as follows:—

- Gin, 93 cases.
- Rum, 36 demijohns.  
- Salt, 18 bags.
- Cloth, 1,157 pieces,

and also numerous packages of matches, cutlery, &c. The kernels which go to Ejirin appear to come from the Modakeke and the Ife districts, and I do not find that there is any increase this year; on the contrary, so far as I have been able to learn, there is a falling-off in the kernel trade at Ejirin, as the price there is low.

Ikirun, a town near Apomu, is a great centre for kernel traders. These people go round to the farms buying up the kernels, and sell them again in Ibadan, either to the European firms, or in most cases to native traders. I was informed by some of the Ikirun traders that they had actually lost money on many of their trips this year, owing to the low price obtainable in Ibadan.

The kernel crop in the Ikirun and Apomu districts is said to be good, but so many traders have discontinued their journeys that there is a great falling off in the trade. Some of the farmers take the kernels themselves to Ibadan, but the majority sell to the traders. Many kernels this year have been sold to the soap makers.

At Gbangan, a town on the road from Apomu to Ife, the Bale and people stated that the kernels crop was good, but the price paid at Ibadan offered no inducement to farmers to take their kernels to market. They informed me that no kernels from that district were taken to Ejirin. A man from a farm village near stated that quantities of kernels were lying there.
At Ashipa, a large farm village, I found a considerable quantity of kernels lying on the ground, some of last year crop, and was informed that many were lying on the neighbouring farms. The Bale stated that in former years traders from Ilesha, Ife, and Modakeke were accustomed to buy kernels in Ashipa, and take them on to Ibadan, and also that other traders came out from Ibadan to buy, but that this year very few passed through from Ilesha, and the Ibadan traders had also ceased to come.

The Bale and people of Petumodu, a town near the Ikirun Ife Road, informed me that some kernels from that district were taken to Ibadan, some to Ejirin, but that the traffic to both places had fallen off this year, owing to the drop in prices. The kernels are kept on the farm in the hope of an improvement in the price. At this town I saw a number of kernel traders, who were idle, owing to the depression in the trade.

At Modakeke I found considerable quantities of kernels being sold in the market, others had been bought for the manufacture of soap. All the principal traders in this town take their kernels to Ibadan, but some of the farmers carry small quantities to Ejirin, and some kernels are sold to soap makers. The crop is said to be good.

At Ife the crop is reported to be good, and kernels from that district are taken to Ibadan, very few going to Ejirin.

There is a road from this town through Modakeke and Ishoya to Benin City, but no kernels pass down that way.

At Ilesha the Owa and Chiefs stated that owing to the low price paid for kernels at Ibadan this year it did not pay the people to carry them so far, nor did they take them to Ejirin. They say that a large quantity of kernels would be obtained from that district if the Railway was more accessible. The crop is said to be good this year.

At Oshogbo I was informed that the kernels in that district were all used to native black oil, as there was a lack of carriers to take them to markets.

Ede, a large town between Oshogbo and Iwo is a point through which caravans pass from Ikirun district with kernels for Ibadan. There is, however, a great decrease in the number of caravans this year, owing to the falling off in price. From Ede a road runs direct to Modakeke.

The manufacture of black oil from kernels was in process in many places in this town.

At Kuta, a village near the River Oshun, the Bale said that the crop was not good this year. Kernels from this district are sold at Olodo or Ibadan.

At Illegbo, another village between Ede and Iwo, it was stated that most of the kernels had this year been used to make black oil, and that the crop was not good.
11. At Iwo the kernel crop was said to be poor this year. Kernels are sold either at Olodo or Ibadan. Caravans from Ikirun, Oshogbo, Ede, and Ogbomosho pass through this town to Ejirin, some going through Ikiri and Apomu, others through Ibadan. There is a direct road from this town to Ikiri, also a road to Oyo: it would thus be possible for Oyo people to go to Ejirin without passing through Ibadan, but it is evident from the condition of the road between Iwo and Oyo that it is very little used. So far as I can ascertain from the people of Iwo, no kernels destined for Ejirin pass through that town.

12. There is no kernel trade in the Oyo district, but there are kernel farms between Ijaye (on the Ibadan Oyo Road) and Ibadan, at these farms the people state that the crop this year is a very poor one, and that the decrease in kernel traffic is due to this cause.

13. The information that I have gathered may be summarized as follows:–

(a) That the principal kernel districts are – The country near the Apomu Road between Ibadan and the River Oshun; the neighbourhood of Ikiri and Apomu; and the district of Modakeke, Ishoya, and Ife; and the neighbourhood of Ilesha. There is, I think, no doubt, that with greater facilities for taking the kernels to market there would be a great development of the kernel trade in these districts, and also in those of Ikirun, Oshogbo, Ede, and Iwo.

(b) That the principal routes to Ibadan are – From Ogbomosho, Iperun, Oshogbo, and Ede, through Iwo. From Ilesha, Ife, Modakeke and Ishoya, through Apomu.

(c) That the principal routes to Ejirin are – From Iperun, Oshogbo, Ede and Ogbomosho, partly through Iwo and Ibadan, and Ijebu Ode, and partly through Iwo, Apomu, and Ijebu Ode. From Ilesha, Ife, Modakeke, and Ishoya through Apomu and Ijebu Ode.

(d) That there is no canoe traffic from any of these kernel districts by the River Oshun, Ona or Oni.

(e) That almost the whole kernel trade of these districts goes to Ibadan, only small portion to Ejirin.

(f) That the kernel crop this year has been good in most districts except those in the immediate neighbourhood of Ibadan.

(g) That the decrease in the quantity of kernels brought to Ibadan is due to the low price offered by the merchants, which is not sufficient to pay the people for carrying their kernels a long distance.

(h) That the imposition of tolls at Ibadan, though entirely to the decrease in price of kernels, would not in itself have been sufficient to cause the falling-off in the kernel trade.
(j) That greater railway facilities, and the presence of European traders in the kernel districts would cause a considerable increase in the kernel trade. The kernels now pass through so many lands before reaching the European firms that the farmer himself receives a very small price for them. In this connection I may mention that complaints were made to me, in all the kernel districts that the native traders of Ibadan will not allow farmers and others, who carry their kernels to that town, to sell them direct to the European firms, but intercept the caravans on the way, and compel the people to sell to them instead of to the Europeans.

(k) That there is no increase in the kernel traffic from these districts to Ejirin this year, but that kernels are being sold to the soap-makers, or kept on the farms in the hope of an improvement in the price.

I have, &c.,
R. Bonham Smith,
Traffic Inspector.
The Traffic Superintendent,
Ebute Metta.
**Part I. – INTRODUCTORY.**

1. The Committee was appointed by His Excellency the Governor on the 29th September, 1931, with the following terms of reference:—
   To scrutinize Government expenditure upon and revenue derived from the Railway and Harbours and to make suggestions that will lead to economic improvement.

2. [...]

**Part II. – DEPARTMENTAL EXPENDITURE.**

5. The Committee adopted the method of examining in detail the expenditure of every branch of the Gold Coast Railway and Takoradi Harbour, as classified in the various Abstracts into which the Estimates of the Department are divided. The head of each branch attended while his particular Abstract was
under discussion. The Committee had the advantage of having before them the
draft Estimates of the Department for the year 1932–33, prepared in the form
in which they will shortly be submitted to Government, and were thus able to
approach their task in possession of full knowledge of the prospective economies
which the General Manager himself proposed to effect.

RAILWAY.

ENGINEERING BRANCH, ABSTRACT ‘A.’

6. Mr. F. V. Macdonald, Acting Chief Engineer, attended. In 1932–33 the
following net reductions in expenditure will be effected:–

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Emoluments</td>
<td>3,184</td>
</tr>
<tr>
<td>Other Charges</td>
<td>13,045</td>
</tr>
<tr>
<td>Total</td>
<td>16,229</td>
</tr>
</tbody>
</table>

A proportion of these savings has been accomplished by the reduction of four
European and nine African posts.

The Committee learned from the Acting Chief Engineer that the number of
African foremen platelayers had recently been increased and that they were now
in charge of more than one-third of the total mileage of the line.

7. Of the decrease under Other Charges £10,000 is attributable to a reduction
of daily paid staff and to the rate of wages having been reduced from 1s. 6d. to
1s. 3d. a day. The Acting Chief Engineer agreed to a suggestion that henceforth
all new labour engaged should be paid at the rate of 1s. a day for the first three
months and at 1s. 3d. thereafter should the labourer prove satisfactory and be
retained. It was calculated that a saving of £500 would be effected.

8. In the Legislative Council during September last the Gold Coast Railway had
been adversely criticised and unfavourably contrasted with the Nigeria system on
account of the cost per mile of the maintenance of the line. The General Manager
explained to the satisfaction of the Committee that the criticisms made were not
deserved. He pointed out that the principal factor in considering such figures is
the question of how much track has annually to be relaid and paid for out of funds
provided for maintenance. For example in 1930–31 a large part of the line from
Takoradi Junction to Takoradi Harbour had to be resleepered owing to the dete-
rrioration of wooden sleepers originally put down by the harbour contractors.

9. As regards the comparison between the Gold Coast and the Nigerian fig-
ures in this respect it was explained that the difference in the rates of wages
prevailing in the two Colonies is of itself sufficient to account for the disparity.
In Nigeria the wages of a railway labourer average about 9d. a day while until
recently they have been exactly double this sum in the Gold Coast and even now are 1s. 3d. a day. Furthermore, much of the Nigerian Railway is laid through open country; in the Gold Coast the line for the most part runs through dense forest with the result that the cost of ‘bushing’ and keeping telegraph lines clear of large trees constitutes a very heavy burden. Again, in the Gold Coast there are only ten miles of light railway (Accra-Weshiang), whereas Nigeria has 133 miles of such track. This is a further factor in reducing the maintenance cost per mile in Nigeria. Lastly, in this Colony there is still a number of old-fashioned station buildings made of swish of which the cost of upkeep is disproportionately heavy as compared with permanent structures built of concrete.

LOCOMOTIVE, CARRIAGE AND WAGON BRANCH, ABSTRACT ‘B.’

10. Mr. R. T. Kerr, Chief Mechanical Engineer, attended.

The following savings in Personal Emoluments will be effected in 1932-33:

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superintendence</td>
<td>1,245</td>
</tr>
<tr>
<td>Running Expenses</td>
<td>1,794</td>
</tr>
<tr>
<td>Maintenance and repair of Locomotives, Rolling Stock and Machinery</td>
<td>3,682</td>
</tr>
<tr>
<td>Maintenance and operation of Electric Plant</td>
<td>745</td>
</tr>
<tr>
<td>Maintenance and operation of Cranes</td>
<td>48</td>
</tr>
<tr>
<td>Total, Personal Emoluments</td>
<td>7,514</td>
</tr>
</tbody>
</table>

This result will be achieved by the retrenchment of 13 European and 12 African appointments, exclusive of six European appointments which have been abolished during 1931–32.

11. The Other Charges of this Branch will be reduced as follows:

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Running Expenses</td>
<td>24,220</td>
</tr>
<tr>
<td>Maintenance and Repairs, Locomotives, Rolling Stock Plant and Machinery</td>
<td>17,800</td>
</tr>
<tr>
<td>Maintenance and operation of Electric Plant</td>
<td>2,900</td>
</tr>
<tr>
<td>Maintenance and operation of Cranes</td>
<td>2,077</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2,426</td>
</tr>
<tr>
<td>Total Other Charges</td>
<td>£49,423</td>
</tr>
<tr>
<td>Total for the Abstract</td>
<td>£56,937</td>
</tr>
</tbody>
</table>

12. The Committee noted with satisfaction that the large economies set out above had been rendered possible by careful supervision and constant attention to the introduction of the most modern labour-saving methods and devices in the workshops and by very close estimating for wages, fuel, etc., both in the shops and on the road.

13. This Branch had also been criticised in Legislative Council. Adverse comment was directed towards the number of locomotives – 79 – which the Railway
maintains. The General Manager explained to the Committee that, although owing to the heavy decrease in traffic he had at the moment an excess of engines, they were no more than sufficient to cope with the requirements of the manganese mines at Nsuta in normal times, of the cacao harvest over a certain portion of the year and the general traffic that was forthcoming ordinarily. The seasonal nature of the traffic, even in prosperous times, combined with the irregular demands from Nsuta were disadvantages with which the Gold Coast Railway must always contend.

It was pointed out that decreased running though implying diminished earnings also means that there is a saving on repairs. / 14. It had been stated in the Legislative Council that in the Gold Coast Railway the cost of upkeep of engines, coaches and wagons amounted to 24 per cent of the revenue of the Department as compared with 9 per cent in Nigeria. The Committee learned from the General Manager and the Chief Mechanical Engineer that the cost of the Electrical Department – a revenue-earning undertaking which pays for itself and shows a profit – and of the maintenance and operation of cranes should be deducted from the Gold Coast figure, the percentage being reduced to 10.8 thereby. As in the case of the maintenance of the permanent way the difference between the rate of wages in the Gold Coast and in Nigeria would more than account for the disparity in favour of the latter.

As compared with Nigeria the Gold Coast Railway has to contend with a further disadvantage in that the cost of Udi coal delivered in the Gold Coast is about four times as high as the figure for which the Nigerian Railway can obtain it. Incidentally the Chief Mechanical Engineer informed the Committee that the engines on the Nigerian Railway consume 22 lbs. of fuel per engine-mile more than his engines.

15. The General Manager acquainted the Committee with figures relating to nine comparable railways in the Dominions and Crown Colonies, all of which showed a higher relation of operating costs to earnings than the Gold Coast Railway in spite of substantial reductions in railway rates during the past four years and the fact that in the Central Province Railway there are 100 miles of open lines – one-fifth of the whole – which, admittedly, are not remunerative. In England the working costs of the railways average about 82.18 per cent of their total revenue: the corresponding figure in the Gold Coast is only 55.75 per cent.

16. As a matter of incidental interest it was noted that the Nigerian Railway employs 80 European engine drivers, the corresponding number in the Gold Coast being four which is shortly to be reduced to three.
Traffic Branch, Abstract ‘C.’

17. Mr. W. E. Lewis, Traffic Manager, attended.

The Committee was informed of prospective savings under this branch in 1923–33 amounting to £15,264 made up as follows:–

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superintendence</td>
<td>5,797</td>
</tr>
<tr>
<td>Station, train and wharf staff</td>
<td>7,111</td>
</tr>
<tr>
<td>Other charges</td>
<td>2,356</td>
</tr>
<tr>
<td><strong>£15,264</strong></td>
<td></td>
</tr>
</tbody>
</table>

Eight European and 51 African posts were to be retrenched and the staff to be retained represents the irreducible minimum with which the line can be operated safely and with reasonable efficiency.

18. The General Manager referred to a statement made at the last meeting of the Legislative Council that there are seven station masters at Sekondi: he assured members that this criticism was not supported by the facts.

19. A further suggestion had been made that there are too many small and unimportant railway stations in the Gold Coast which have no pretensions to paying their way even in good times. It was proved to the satisfaction of the Committee that this is a question which cannot be judged solely in the light of the revenue earned at such stations, but that the provision of ample crossing points is of paramount importance to the safe, efficient and rapid handling of traffic on a single line. Rapidity of handling is especially important at present when the reduction in the traffic staff has rendered it necessary to restrict the running of trains to the hours of daylight only. Further to reduce the efficiency of the service by thus slowing down through-running would have a very injurious effect upon the cacao industry during the harvesting and shipping season. Moreover the slower the traffic the more would passengers seek the omnibus and lorry services.

Further points in this connection were that the revenue shown in Table XIII of the General Manager’s Annual Report for 1930–31 did not reflect passenger traffic which was considerable at some small stations and that the cost of alteration of the electrical instruments and the maintenance cost of the empty station must be set against the savings on Station Staff.

A last point relating particularly to the Sekondi-Kumasi line, in the neighbourhood of which motor roads are not so numerous, is the inconvenience to which the local travelling public would be exposed by the abandonment of even unimportant wayside stations.

20. After hearing the Traffic Manager on the point and examining the figures of recent passenger traffic produced by him the Committee arrived at the conclusion that an increase of traffic facilities would repay the cost; and for that
reason as well as from regard to the convenience of the public they expressed the opinion that the daily passenger train service should be restored throughout the system in place of the thrice weekly service which has been in operation for the past three months. The General Manager concurred with this view and undertook to restore the full service with effect from the 9th November.

**Management, Accounts, Stores, Abstract ‘D.’**

21. Mr. H. Mason, Chief Accountant, and Mr. F. C. Deacon, Chief Storekeeper, attended.

*Management.*

The estimated saving under this Head of the Abstract in 1932-33 will amount to £1,598. This is the result of abolishing the posts of Deputy General Manager, Chief Clerk and one Second Division Clerk.

22. The necessity of retaining three Europeans in the posts of Secretary and two Assistant Secretaries, one of whom is provided for under Management, Takoradi Harbour, Abstract ‘N,’ was exhaustively discussed.

The General Manager explained their duties and stated that the three posts were all the more necessary since the decision to abolish the post of Deputy General Manager. Referring to his frequent absences from Sekondi he stressed the necessity for an appointment in his (the Management) branch the holder of which could give minor routine decisions so as to avoid delay and expense. The General Manager’s suggestion was that the title of the Secretary should be changed to ‘Assistant to the General Manager’ and that his scale of salary should be £720 rising to £920. No additional expense would occur if the present Secretary were to be so appointed. He coupled this with the suggestion that the Assistant Secretaries should in future be entitled ‘Office Assistants,’ remaining on the same salary scale as at present. The Committee during the course of their inquiry had ample evidence of the responsible nature of the Secretary’s duties and the importance of the post being filled by an officer with wide practical experience of railway administration. The disappearance of the post of Deputy General Manager enhanced these considerations. They concurred generally with the General Manager’s proposals and expressed the opinion that it would tend to remove a certain amount of misconception in the public mind if these changes were put into effect.

The Committee recommends that these changes be carried into effect when Estimates are before Legislative Council.

/ The Committee was informed that at the present time there is no African in the Railway Service of sufficiently wide experience of Railway work to render him competent for appointment as Office Assistant (Assistant Secretary). The
Committee recommends unanimously that African officers should be trained to fill such posts and that such an appointment should be made as soon as a competent African officer is forthcoming.

23. In the course of this discussion the Committee took note of the fact that the Management Branch with four Europeans, of whom one is a relieving officer, controls a concern of which the capital face value (including the harbour) exceeds twelve million pounds with an annual turnover of one million pounds and a length of line of over 500 miles. The Committee considered that in these circumstances the Management establishment could not be criticised as extravagant.

Accounts, Abstract ‘D.’

24. The Committee were informed that in 1932–33 savings amounting to £1,800 will be effected by retrenchments, but the actual net reduction in expenditure will be £720, despite a reduction of one European and four African posts.

25. It was noted that the cost of this branch represented about two per cent of the total revenue of the Railway which, though possibly a somewhat high ratio in comparison with the corresponding figures of commercial firms, could hardly be condemned as extravagant. Nevertheless, the proportion of European to African appointments were considered to be too large and the Committee recommends that the possibility of replacing some European Accountants by Africans should be given careful consideration.

26. The Chairman communicated to the Committee the gist of the Secretary of State’s Miscellaneous despatch of the 12th August, 1931 regarding a proposed investigation by Sir A. Lowes Dickinson into the systems of railway accounting and audit in the Colonies, etc. It was decided, therefore, that, apart from the recommendation recorded in the preceding paragraph, this subject should await the result of those inquiries.

Printing Branch, Abstract ‘D.’

27. In 1932–33 there will be net savings totaling £263 accomplished, in a measure, by the reduction of three African posts.

Stores.

28. In this branch there will be a small increase of £40 in 1932–1933 due to increments of salaries.

29. The Chief Storekeeper stressed the following points:–
   (a) That by close supervision in this Branch and very strict control of stocks it is calculated that during the last three years cash to the value of £36,000
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has been released which would otherwise have been unprofitably locked up in unnecessarily heavy stocks of unallocated stores.

(b) That the turnover of the Branch averages £300,000 annually and that the value of the stock in hand carried at any one time is usually in the neighbourhood of £69,000.

(c) That the total cost of the unallocated stores represents about six per cent of the revenue of the Railway as compared with 10 per cent on English railways.

Mr. Deacon asserted strongly that any considerable reduction of his staff, e.g. by ten per cent (saving about £700), would seriously impair the efficiency of the storekeeping and that the almost inevitable result would be increased expenditure rather than economy.

30. Certain members of the Committee were of opinion that although six supervision posts might be necessary some of them could be filled by Africans with consequent economy. The Chief Storekeeper stated that the policy of training suitable Africans for these posts was always kept actively in view. The Committee generally welcomed this statement but one member (Mr. Korsah) expressed a sense of disappointment that during the past 25 years or so it had not been found possible to train Africans to fill European appointments in this Department. He desired to recommend definitely that the post of Assistant Chief Storekeeper, or of one of the Assistant Storekeepers, should be abolished.

The Committee make no recommendation on this point of detail which, they felt, must be left to the General Manager as advised by his Chief Storekeeper.

Other Charges.

31. £2,246 will be saved in 1932–33 as compared with the current Estimates. There is likely, however, to be an actual saving of about £2,000 in 1931–32.

Services Rendered by Other Departments – Abstract ‘G.’

32. There will be savings in 1932–33 amounting to £5,630 in respect of services rendered by other departments, but loan and pensions charges will increase by £20,700. The net increase in this Abstract will be, therefore, £15,070.

Summary of Railway Economies.

33. The total estimated expenditure in 1932–33 will be £1,058,102 representing a net decrease of £58,398 as compared with the corresponding figure (£1,116,500) in 1931–32. This decrease would be the greater by some £1,711 were it not that the Railway has assumed charge of Government Transport work at Sekondi and
Takoradi. A set-off of £675 in revenue is anticipated. By this step the retrenchment of one European officer of the Transport Department was made possible.

34. [...]

TAKORADI HARBOUR.

ENGINEERING SUPERINTENDENCE – ABSTRACT ‘K.’

Mr. F. V. Macdonald, Acting Chief Engineer, attended.

35. The total of this Abstract will be reduced in 1932–33 by a net amount of £2,728.

LOCOMOTIVE BRANCH – ABSTRACT ‘L.’

Mr. R. T. Kerr, Chief Mechanical Engineer, attended.

36. In 1932–33 the Chief Mechanical Engineer anticipated savings under this Abstract totalling £4,580.

HARBOUR MASTER’S BRANCH – ABSTRACT ‘M.’

Captain C. R. Hemans, r.n., Harbour Master, attended.

37. The expenditure under this Abstract will be reduced in 1932–33 by £834.

38. The question of reducing the two existing administrative posts (viz., those of Harbour Master and Assistant Harbour Master) was brought to the notice of the Committee by instruction of the Governor. Briefly, the proposal involved –
   (i) abolishing the post of Harbour Master;
   (ii) altering the title of Assistant Harbour Master to that of ‘Port Officer’ with no change in emoluments; and
   (iii) retaining the senior pilot and the two pilots on their existing salaries, the senior pilot to relieve the Port Officer when necessary.

After full discussion the Committee recommends unanimously that no change be made in the existing establishment. Members united in the opinion that the resulting economy was incommensurate with the risk of damage to the harbour itself and to ships that would be incurred thereby. Nor could Takoradi afford to risk its reputation as a safe harbour where ships could expect expeditious treatment. With the reduced staff suggested there would be a considerable danger that at times pilotage would be insufficient as a result of leave and sick casualties.

39. A member of the Committee advocated the appointment of African tug masters. It was pointed out, however, that these posts could only be filled by fully qualified seamen of long experience and that no African possessing the necessary qualifications was at present available.
Management Branch – Abstract ‘N.’

40. The abolition of the post of Deputy General Manager will be reflected in this Abstract amounting to a saving of £212.

Accounts.

Mr. H. Mason, Chief Accountant, attended.

41. During 1932–33 the saving in this Abstract will be £106.

42. The staff of this branch is occupied solely in the collection of harbour dues and the feasibility of transferring this duty to the Customs Department was discussed. The Committee was advised that from the point of view of the Railway there could be no objection to the proposal which, in fact, had everything to recommend it. The Customs Department would collect the dues directly from the shipping companies instead of from the various importers and exporters which is the present practice. The financial effect, if this proposal be adopted, will be the total disappearance of the Accounts section of Abstract ‘N’ from the Estimates, thus achieving a gross saving of about £1,700. It was recognised that the concurrence of the shipping companies with this change in practice would have to be obtained. / The Committee recommends strongly that the subject should be taken up and pressed by Government.

Stores.

Mr. Deacon, Chief Storekeeper, attended.

43. There will be a small increase of £11 in 1932–33 due to increments.

44. The provision under Other Charges for this Abstract in the 1932–33 Estimates shews a decrease of £282.

Services Rendered by Other Departments – Abstract ‘O.’

45. There will be a decrease of £642 in 1932–33. Loan Charges will be reduced by £1,317.

Summary of Takoradi Harbour Economies.

46. It is anticipated that the total cost of the Harbour will be £186,952 in 1932–33 which is £10,690 less than the estimate for the current year. Fixed charges will absorb £153,316 leaving only £33,636 for all working expenses. The Committee was assured by the General Manager that any further pruning would be quite out of the question if reasonably efficient operation was expected.

47. [...]

It is anticipated that in 1932–33 the Expenditure and Revenue of the two undertakings will be as follows:

<table>
<thead>
<tr>
<th></th>
<th>Railway</th>
<th>Takoradi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditure</td>
<td>£1,058,102</td>
<td>£186,952</td>
</tr>
<tr>
<td>Revenue</td>
<td>£810,675</td>
<td>£107,500</td>
</tr>
<tr>
<td>Loss</td>
<td>£247,427</td>
<td>£79,452</td>
</tr>
</tbody>
</table>

49. Far the greater part of this expenditure is on account of fixed charges for Loan Interest, Sinking Fund, Pensions and Renewals Contribution which are beyond the control of the Administration. In the case of the Railway the amount required for these purposes is £631,817 and for the Harbour £153,316, leaving only the sums of £426,285 and £33,636 respectively within which economies can be sought by the General Manager. In these circumstances the Committee desire to record unanimous appreciation of the determined effort towards economy made by the General Manager and his Staff amounting in the case of the Railway to £98,847 and in that of Takoradi Harbour to £9,373.

50. They note that the reductions in staff amount to 16 per cent of the Europeans and 11.6 per cent of the Africans on the Railway: staff reductions in the Harbour establishment account for 13 per cent of the African Staff allowed in the current year’s Estimates.

51. The Committee is prepared to accept the assurance of the General Manager that, failing a general reduction in the scale of personal emoluments – this subject is mentioned later in this Report – no further appreciable reduction in working expenditure can be effected immediately without a dangerous sacrifice of efficiency.

Takoradi Salaries.

52. Items 1, 2, 27, 28, 77, 78, 89 and 90 in the 1931–32 Estimates.

The General Manager explained that these emoluments originated in an endeavour to keep down the overhead costs of harbour working; the total cost is £700 a year which is far less than would be the cost of a separate Harbour Authority. He emphasized that they were salary payments, not allowances, and should be treated in line with all other salaries. The Committee agreed with this view but recommend that, if and when new scales of salary are devised, consideration be given to the advisability of consolidating the salaries of the posts concerned, a lump sum representing the cost of management and supervision being charged against the Harbour Expenditure and shewn in the Railway Rev-
As shewn at the present time these emoluments have the appearance of allowances and are prejudiced thereby in the public estimation.

**PART III. – FINANCIAL POLICY.**

53. In the course of the Committee’s deliberations questions relating to the rates and dues charged by the Railway and Harbour Administrations came frequently under discussion and led eventually to consideration of the financial policy according to which those charges are framed. The same point of policy was raised directly by the President of the Chamber of Mines both in his written and oral evidence.

54. The Committee understood that the basis upon which Railway rates and harbour dues are founded is that the total revenue of each system shall cover all its working expenses and extraordinary expenditure together with all the fixed capital charges which relate to that system. Where a profit over and above those expenses is made it is paid into General Revenue although, according to the Committee’s information rates and dues are not framed with a view to such a contribution to the Colony’s surplus.

55. It was not denied by the General Manager that, as compared with other African railways, certain rates charged on the Railway are high and Mr. Millar made similar assertions with harbour dues on manganese ore at Takoradi in comparison with those charged at a South African port. On the other hand rates over the portions of the Railway are driven to a relatively very low point by the strong competition of competitive road users, while Takoradi revenue suffers from the cheapness with which cargoes can be placed aboard or landed at neighbouring ports both British and French. /

The issues arising out of these facts were –

*Firstly:* whether the policy of framing rates and dues so as to cover all charges, both working and capital, is in the best interests of the Gold Coast and

*Secondly:* what measures, if any, should be taken to reduce the force of competition from motor lorries and cheaper ports.

56. The total cost of a transportation system may be classified as follows: –

\[\text{Recurrent.}\]

\[(a)\] Working expenses;
\[(b)\] Pensions and Gratuities;
\[(c)\] Renewals Fund Contributions;
\[(d)\] Interest on Loans;
\[(e)\] Sinking Fund Contributions.
The Committee considers that there can be no dispute upon the point that the system's revenue must at the very minimum be calculated to cover (a) (b) and (c) above.

In connection with the liability of the Railways to find the whole of the capital charges incurred on its account, the President of the Chamber of Mines (Mr. Millar) took the view in his evidence that the Railway should be made to pay its way but that its liability in respect of both Interest and Sinking Fund should first be largely reduced. The reasons which led him to those conclusions are fully and clearly stated in Appendix II.

The issue which presented itself to the Committee was, however, anterior to Mr. Millar's point and raised the question whether it is essentially necessary for a State-owned railway to aim at producing sufficient revenue to cover all the capital charges which would properly be debited against a railway conducted on commercial lines.

The Committee desires to point out that Railway receipts form only one of several channels through which revenue flows to Government as a result of increased wealth on the part of the community. Most of the Heads of Revenue appearing in the Gold Coast Budget, but particularly Customs and Licences and Internal Revenue, tend to rise or fall pari passu with the quantity of and the prices paid for the raw products exported from the dependency. It does not follow, therefore, of necessity that the country loses as a whole because certain commodities are moved by its transportation systems at rates which are unre-munerative to those systems when capital charges are taken into account, for the revenues flowing back indirectly from their production and sale may be such that it is better for the country as a whole to move such commodities at a loss than to insist on rates which, though sufficient on paper to cover transportation expenses, in practice would tend to diminish or to eliminate their production.

The corollary of this is that, if the Railway is to be required for the benefit of the country to charge rates in certain instances which, though reimbursing it for working expenses do not fully cover the cost of transportation inclusive of capital charges. If it were possible to determine the relation between the value of exports and the indirect revenue received by Government which is created by that value it might also be possible to fix formulae for the relative liabilities of the Railway and Takoradi Harbour on the one hand and of the Colony on the other for the capital charges of those systems. The Committee doubts whether
such a determination is possible – it is certainly beyond its own competency – but does not hesitate to come to the general conclusion that, having regard to the facts that the local transportation systems were built partly for administrative and defensive objects and that from the commercial point of view these systems are only two of several channels through which the Gold Coast derives revenue from the producer’s efforts, general revenue may properly be called on to bear a portion of the capital charges arising from the construction and equipment of those systems.

61. The Committee considers that this question, which is fundamental to the financial policy of the Railway and of Takoradi Harbour, could profitably be examined by an expert economist and commends that suggestion to Government’s consideration. As they view the matter, they are not prepared to recommend an arbitrary allocation of capital expenditure, such as that suggested by Mr. Millar; indeed, if and for so long as rates and dues can be devised which, without injurious reactions upon industry, will produce revenue sufficient to cover interest charges on the loan money spent on the Dependency’s transportation systems, they consider it reasonable that those charges should be so borne. Their contention is that the determining factor in the fixation of rates and dues should be the ability of commodities to bear the rates charged for their carriage rather than the principle that each transportation system must be made to pay its whole way in working expenses and interest.

62. The case of Sinking Fund charges on the Railway Loans is, in the opinion of the Committee, essentially different. They should be borne by the General Revenue of the Dependency in view of the fact that when the loans have been completely amortized the Gold Coast will come into possession of a free Railway system and a free Harbour. The Committee noted that the Sinking Fund contributions account of Takoradi Harbour are borne by the Colony.

63. A further point connected with the financial policy of the transportation systems raised by Mr. Millar (paragraph 5 (a) and (b) of Appendix II) was whether Railway profits, when any, should continue to be paid over to General Revenue which would also bear the system’s losses or whether they should be funded as a Reserve in order to cover losses in leaner years. In this connection Mr. Millar made the further suggestions (1) that all payments of surplus earnings from the Railway made to the Consolidated (i.e. General) Revenue since January 1st, 1921 should be deducted from the capital expenditure on which the Railway should pay Interest and Sinking Fund and (2) that rates should be adjusted so that surplus earnings do not exceed 2½ per cent on the capital invested. The Committee presumes that Mr. Millar intended to suggest a similar policy in respect of Takoradi Harbour.
64. The Committee notes that no such proposal was included in the recommendations made by General Hammond in his 1922 Report. In the Committee's view such a fund would have the obvious advantage to the Colony that its Estimates would cease to be liable to sudden violent dislocation as has occurred recently when an anticipated Revenue item in the Colony’s Estimates of £50,440 has been replaced by an unforeseen expenditure item of £187,000. Moreover, in thus achieving a greater independence of considerations affecting the General Revenue, the General Manager should be in a better position to lay down and maintain rate scales drawn on scientific basis.

65. The Committee therefore commends the suggestion to Government’s consideration. As regards Mr. Millar’s two riders above mentioned, the Committee is of opinion that other factors, such as the losses borne by General Revenue over the period, would have to be taken into account: they are also doubtful whether any good purpose would be served by attempting to lay down a maximum profit, at any rate at this stage.

66. The second issue mentioned in paragraph 55 above was what measures, if any, should be taken to reduce the competition which the Railways suffer from road-using transport and Takoradi Harbour from neighbouring and cheaper ports. As regards the Road versus Rail problem the Committee did not disregard the argument that Government would not be justified in placing even the smallest handicap upon road-borne traffic, with the object of relieving the Railway of some of the stress of competition, in as much as any such measure must raise the cost of production and thereby react unfavourably upon Gold Coast trade. This argument however, disregards the facts that, making all allowance for administrative objections, much of the greater part of the capital expenditure on the Railways and the whole of that on Takoradi Harbour have had the development of production as their aim and, secondly, that whether or no the Railways and the Harbour are used in the marketing of the Colony’s produce, the capital charges thus created, to say nothing of maintenance expenses, have to be met from the wealth produced in the Colony. If the revenue of the two systems is inadequate to meet such capital charges as are considered to be their proper liability the general taxpayer must make good the deficiency. That in itself would constitute a hardship on the taxpayer. If, further, the latter has to bear the recurrent cost of a road system – also designed largely for the producer’s benefit – while the latter escapes from any greater share of both burdens than would descend upon him in his capacity of general taxpayer, the hardship develops into inequity.

67. The Committee devoted considerable thought to the search for a practicable remedy for the unfair competition to which the Railway is subjected by the roads and they greatly regret their inability to discover one. Two members were inclined to support a heavy increase in licence fees for motor lorries but after discussion it was recognized that such a measure, if effective at all, would tend to
restrict the area within which cacao can be grown and transported by such vehicles to the Railway. The problem is essentially one the solution of which must not affect roads feeding the Railway: it follows that no general measure arriving at an increase of the cost of road transportation will serve.

68. Another suggestion put forward was the periodical closing of certain roads to heavy traffic: this was discarded as impracticable. The taxation of heavy traffic using the competitive roads was also proposed; Mr. Millar suggested the lease of their transport rights to firms at specified freight rates and the ordinary toll-gate system also came under discussion.

69. Although by either of these latter measures it would be possible to discriminate between non-competitive and competitive roads and although no other method of achieving that result was suggested, nevertheless the Committee do not recommend the adoption of either.

It was felt that Mr. Millar’s proposal might lead to highly invidious situations, and the Committee feel that the institution of toll-gates would fail to meet general acceptance. Apart from the delay of traffic which would affect all road users and the practical difficulties of selecting positions which would attain the object sought by the measure, an elaborate and expensive inspectorate system would be necessary unless evasion and peculation were to become rife; lastly, any such institution would be and remain the object of general dislike. The most that the Committee can say for it is that in principle it is the best solution in sight: they are too doubtful of its success in practice to recommend its employment.

RAILWAY RATES AND HARBOUR DUES.

70. Certain specific points relating to Railway Rates and Harbour Dues fell to be considered by the Committee. /

(i) Passenger Rates – 3rd Class.

Passenger fares are at present one penny a mile plus 15 per cent and this form of traffic is suffering heavily under road competition. The General Manager who brought the matter before the Committee expressed the belief that no reduction which did not decrease the fare to a figure in the region of three farthings a mile would have any appreciable effect in obtaining for the Railway a greater share of this traffic. He was inclined to favour such a reduction.

The Committee saw no objection to that course and in the circumstances assumed that the General Manager would submit his considered proposal to Government for consideration.
(ii) Rates on manganese ore from Nsuta.

The Committee was informed that the African Manganese Company had already applied to Government for a lower rate on manganese ore from mine to Takoradi, representing that owing to high local transportation costs it was not possible for the Company to quote successfully against the competitors whom it has to meet to-day in a greatly restricted market. The importance to the Gold Coast of the continuance of this industry is, in the opinion of the Committee, too obvious to require to be stressed by them: a very considerable revenue must flow into the Treasury as a result of the Company’s wage payments and the money spent by its employees. It was no part of the Committee’s duty endeavour to ascertain what in the circumstances is the right economic rate to charge on this traffic.

(iii) Rates charged on cacao exported from Ashanti.

Mr. Lewis stated that the total inward and outward goods traffic receipts during 1930–31 would be classified as to origin as follows:–

<table>
<thead>
<tr>
<th>Origin</th>
<th>£</th>
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<tbody>
<tr>
<td>Ashanti: Dunkwa-Kwahu Prahsu inclusive</td>
<td>487,764</td>
</tr>
<tr>
<td>Nsuta</td>
<td>154,761</td>
</tr>
<tr>
<td></td>
<td>£642,525</td>
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</tbody>
</table>

out of a total goods traffic of approximately £756,548. It would therefore be seen that part of the Railway system as mentioned above contributed no less than 84.9 per cent of the total. Ashanti itself was responsible for 64.4 per cent of the total. This does not take into account passenger traffic, the receipts from which for Ashanti must represent a big percentage of the total earned in this Department.

He asserted that at existing rates all Ashanti traffic to and from the port of Takoradi would travel by road if that form of transportation were possible, a conclusion which proved that existing rates were of penalizing proportions where such could be imposed.

The General Manager did not deny that as a rate on raw produce exported in bulk, the rate on cacao from Kumasi to Takoradi (81s.9d.) was high. He stated, however, that he would be unable to replace by railway earnings the loss which would accrue from even a small reduction of railway rates on cacao from Ashanti. In the circumstances the Committee can make no recommendation for such a reduction at the present time.

(iv) Rates on cacao consigned from Kwahu Prahsu-Konongo Section of the Railway to Takoradi.

The attention of the Committee was directed specifically towards the cacao rate from certain stations in Ashanti on the Accra line to Takoradi. The stations and the rates concerned are the following:–
Akwasiho  70s. a ton.
Kwahu Prasu  74s. a ton.
Bompata  85s. 10d. a ton.
Juaso ...  90s. 11d. a ton.
Konongo  92s. 11d. a ton. /

The rate from Nkawkaw to Accra is 51s. 6d. a ton and the effect of the disparity between it and the other rates named is to encourage the transport of cacao by road from Konongo, Juaso, etc., to Nkawkaw whence it is railed to Accra at a comparatively cheap rate, thus diverting business from the Kumasi-Takoradi line and from Takoradi Harbour which under other circumstances the latter might legitimately hope to secure. Cacao shipped at Takoradi has in addition to bear harbor dues amounting to 3s. 3d. a ton.

(v) As has been stated above no reduction of the rate for cacao from Kumasi to Takoradi (81s. 9d. a ton) can be recommended in present circumstances; but after discussion the Committee agreed that, anomalous though it may appear at first sight, a flat rate of 75s. a ton from all stations between Konongo and Kwahu Prasu inclusive to Takoradi should be introduced, the Kumasi rate being left untouched. Mr. Lewis assured the Committee that, although the Kumasi Chamber of Commerce objected on principle to the present high freight rate from Kumasi and would continue to press for its reduction, they would readily appreciate the motive governing the suggested reduction in the rates for cacao consigned from Konongo-Kwahu Prasu to Takoradi and would not use it as a lever for securing a decrease in the rate from Kumasi.

(iv) Cacao Rates – Táfo-Nsawam to Accra.

A possible anomaly in the rates from stations between Táfo and Nsawam to Accra was also mentioned. After discussion the Committee decided to leave the point to the consideration of the General Manager.

71. The terminal charge (1s. 6d. a ton) at Takoradi was criticised and explained as representing the cost of shunting wagons and facilities for this service. The Committee were informed that a similar charge is levied on all British railways and that at Apapa, Nigeria, it is 2s. 6d. a ton.

The General Manager strongly opposed the abolition of this terminal charge and the Committee accepted his view.

TAKORADI HARBOUR DUES.

72. The President of the Gold Coast Chamber of Mines informed the Committee that in his opinion the harbour dues are too high and in support of his argument quoted figures to show that the port charges on 8,000 tons of manganese ore exported at a South African port amounted £244 10s. whereas the
corresponding figure at Takoradi was £1,549 9s. 1d. In the absence of details as to how they are made up the Committee was not in a position to make a comparative analysis of these figures.

73. It was alleged that excessive charges had the effect of diverting traffic, both imports and exports, to other ports in the Colony. The Committee noted that Takoradi Harbour dues were settled in 1927 by a Committee representative of Government after full consultation with and approval of the mercantile and shipping interests, but they were based on the assumption that Sekondi, Cape Coast and Saltpond would be closed as ports of entry, which assumption had not been realized except in the case of Sekondi. If Cape Coast and Saltpond had ceased to be ports the resulting increase in the trade of Takoradi would in all reasonable probability have permitted the harbour to pay its working expenses and fixed charges. It could not hope at existing charges to compete successfully with surf ports at which no port charges are levied and the expectation that the economic value of the convenience, speed and safety of handling cargo alongside wharves in smooth water would automatically attract most of the trade of Saltpond and Cape Coast had proved by no means fully justified. In this connection it was noted that the shipping companies made no differentiation in their rates for ocean freight on account of this factor.

74. In the Committee’s view the problem at Takoradi Harbour is fundamentally similar to that presented by the Railway, viz., that the port charges were calculated with the object of covering the cost of all the working expenses and fixed charges arising on account of its construction, inclusive of Sinking Fund charges. The Committee is not in a position to state definitely that the Gold Coast as a whole would benefit were the Takoradi Harbour charges to be reduced substantially at the loss of direct harbour revenue: in their opinion this again is a question which requires reference to an expert economist and they commend this suggestion to Government’s consideration.

TRANSHIPMENT CHARGES

75. Mr. Whitfield raised the question of transhipment charges, at present 3s. 3d. per ton for transhipment between ship and ship and 6s. 6d. per ton when cargo has to be put ashore and reshipped. He stated that the effect of this high charge was to exclude business which would accrue profitably were the rate lowered. The General Manager admitted that the point was worthy of full consideration and undertook to investigate it and to report his conclusions to Government. The Committee welcomed this assurance.
RAILWAY RENEWALS FUND.

76. In the Estimates for 1931–32 the sum of £108,854 was provided for renewals, but as an emergency measure in the present crisis payment has been suspended. The corresponding figure for 1932–33 is calculated to be £126,892 and the question has arisen whether provision should be deferred for the second year in succession. The General Manager pointed out that the Fund had only come into existence in 1923–24 while some of the wasting assets of the Railway had been in use for more than 25 years and would inevitably require replacement at an early date. The Fund was therefore not solvent and every deferment enhanced its unsound position. Renewals could not be postponed indefinitely without grave risk to life and property or without creating an uneconomic burden on the future. The Committee were impressed with the gravity of a second suspension of contributions but were not in a position to say whether the financial prospects of the Gold Coast for 1932–33 are grave enough to justify what in normal circumstances would be an indefensibly imprudent step.

[...]

PART V. – GENERAL.

Reduction of Official Emoluments.

78. The President of the Gold Coast Chamber of Mines submitted the following proposals for emolumental reductions:—

(a) That the salaries and wages of future European employees be cut by 25 cent, such cuts not to affect serving officers.

(b) That African salaries and wages be reduced by 50 per cent in the case of men receiving £300 a year or more and that a graduated cut of from 50 per cent to 20 per cent be imposed on salaries ranging from a maximum of £299 to a minimum of £50 per annum respectively.

79. While none of the Committee could entertain these particular suggestions the Unofficial Members are emphatically of the opinion that the financial position of the country requires an immediate reduction in the emoluments of the servants of the Railway and Harbour. In this connection it was stressed that the total provision for Railway emoluments in 1932–33 would be £161,748 plus £508 Transport Service and that the anticipated deficit was some £247,000. In the view of the Unofficial Members, though that situation could not be cured by any cut in emoluments that could be regarded as reasonable, nevertheless, such alleviation as was possible by that method should be applied at once.

80. One member favoured a sliding scale of reductions from a minimum of 2½ per cent on the lowest aggregate earnings to a maximum of 20 per cent on the
highest without racial distinction. He suggested that a scheme be framed on the following lines:

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<tr>
<th>£</th>
<th>Per cent.</th>
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<tr>
<td>100–350</td>
<td>2½</td>
</tr>
<tr>
<td>351–500</td>
<td>5</td>
</tr>
<tr>
<td>501–750</td>
<td>7½</td>
</tr>
<tr>
<td>751–1,000</td>
<td>10</td>
</tr>
<tr>
<td>1,001–1,200</td>
<td>15</td>
</tr>
<tr>
<td>1,201 upwards</td>
<td>20</td>
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</tbody>
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81. Another member advocated a graduated cut in emoluments to be arranged in whatever manner commended itself to Government but to yield the equivalent of 10 per cent on £161,748 plus £508 Transport Service.

82. The Chairman informed the Committee that the whole question of reducing emoluments had been exhaustively examined by the Further (General) Retrenchment Committee and that whatever decision was taken on the Report thereof would, he presumed, apply to the Gold Coast Civil Service as a whole including the employees of the Railway and Harbour. He stated the personal view that though the financial outlook was grave it did not justify a decision to reduce emoluments as from January 1st next. Such a step must have serious reactions in any case and in financial situation in which an emolumental cut was a proper step was quite conceivable in the circumstances in which the Gold Coast found itself. Government should not and would not hesitate to take it if it became necessary: meanwhile the outlook required careful examination at short intervals. The method of such a cut was a subject which required immediate examination by Government: its extent was a matter for determination according to the circumstances of the moment. The Official Members agreed generally with his view.

83. The Unofficial Members recommend that a cut amounting to 10 per cent of total official emoluments be made as from January 1st next; that such a cut be regarded as temporary and variable from time to time with the financial circumstances of the Gold Coast. They further recommend that it be made in such a way as not to injure the pensionable prospects of serving officers.

84. The Committee noted Mr. Millar’s suggestion regarding the salary of future Managers of the Railway (paragraph 5 (h) of Appendix II) but were not prepared to give it their support.
85. The President of Gold Coast Chamber of Mines advocated, in order to decrease the pensions liability, that the possibility of applying some form of compulsory insurance scheme for new European entrants to the service should be investigated and that in any event it should be adopted for Africans. The Committee were informed that Tanganyika and Nigeria already possessed schemes of that kind. The General Manager of the Railway was definitely opposed to any change in the existing pension system as regards the Gold Coast Railway, but two members felt that the possibility of introducing a Provident Fund on a pound for pound contributory basis merited careful consideration by Government.

86. The Committee had before it no figures or other data upon which to found a firm recommendation and, as at present advised, the majority of members felt that no strong case had been made out in favour of the proposal. At the same time it was agreed that the matter should be commended to Government for due consideration as opportunity offers. In this connection Mr. Korsah desired to record his conviction that any attempt to discriminate between the European and African staff would be bitterly resented by the country. All members of the Committee shared this view.

CLOSER RELATIONS BETWEEN THE MANAGEMENT AND THE GENERAL, AND PARTICULARLY THE MERCANTILE, PUBLIC.

87. One member suggested the creation of an Advisory Committee for the purpose of rates revision. The General Manager was not opposed to the suggestion and the Committee advise that it be further explored. The General Manager suggested that a very useful purpose would be served if the Railway was represented in Chambers of Commerce. The Committee was advised that the constitution of the Chambers would not permit officers of the Railway to be admitted to full membership but that they would probably be welcomed as honorary members. The Committee recommended that the General Manager should seek the views of the Chambers of Commerce direct on this point. Mr. Dawson undertook to do so.

BEHAVIOUR OF RAILWAY STAFF TOWARDS PASSENGERS.

88. Mention was made of the criticism which is occasionally directed at the Railway concerning the alleged rough handling of passengers by the Railway Police. Members were assured that this matter was receiving the unremitting attention
of the management and supervisory staff and it was confidently expected that complaints on this score would diminish in future.

CENTRAL PROVINCE BRANCH.

89. The Committee was informed that a pronounced loss was expected on the current year’s working. The Chairman inquired whether any member wished to raise the question of closing this line. Members were unanimous in the opinion that the time had not arrived for the consideration of such a step.

OTHER MISCELLANEOUS SUGGESTIONS.

90. The Committee received some written suggestions from Mr. H. S. W. Shaul: The Committee is unable to endorse Mr. Shaul’s suggestions that a railway line should be constructed from Accra to Takoradi or for flat rates over the Railway for imports and exports irrespective of length of haul.

The Committee agreed with the General Manager’s opinion that seaside excursions from Ashanti would not prove to be a remunerative form of traffic and that neither the financial situation nor the probable volume of traffic that would result justified an experiment in door-to-door service being made at the present time. Mr. Shaul’s other suggestions are dealt with in the course of this Report.

Signed on behalf of and with the authority of the Chairman,
R. H. DAWSON.
SEKONDI,
December, 1931.

Note. – A Memorandum supplementing Mr. M. G. Lewis’ views is published at his request and forms Appendix I to this Report.

APPENDIX I.

Whilst I consider the Report is generally speaking a faithful record of the Committee’s work, I am of the opinion that there are certain essential points arising therefrom that should be given more prominence, and, in this respect, I particularly wish to bring forward the following points.

Management. – I am of opinion that the abolition of one post of Assistant Secretary should be carried out immediately, and that the Committee’s recommendation to train African officers to more responsible positions in this department be energetically pursued.

Accounts. – I consider that no sufficient emphasis has been stressed on the unduly high cost of this department. The proportion of European accountants to African staff is excessive. Admittedly, it is very necessary to have European
accountants to carry out essential supervisory duties, but the proportion at present is unduly high. The figure of 2 per cent mentioned in the report as being the cost of running this department is really not a true comparison if the cost of furlough pay, bungalows, passages and allowances are taken into consideration. If these factors are considered, the percentual figure would be appreciably increased. Mercantile firms in this country have been able to train up an efficient staff of African book-keepers with a minimum of European supervision and the same policy should be carried out by the Railway Accounts Department. If this was done, substantial economies could be effected.

Stores. – Very similar conditions prevail in this department as in the Accounts Department. The proportion of European posts is unduly high, and steps should be taken to reduce the number to not more than three European posts. Admittedly, this is a very important branch of the Railway organisation, but a turnover of £300,000 per annum cannot justify the retention of six European appointments. More responsible African posts, such as storekeepers, should be created. It has been found possible in Mercantile circles to employ African storekeepers in positions involving the responsibility of valuable stocks, and a similar policy could be embarked on by the Railway with advantage, and substantial economies should therefore accrue.

With regard to the Technical Branches of the system, I am not prepared to offer any constructive criticism. The respective Heads of Departments were all emphatic that no further appreciable economies could be put into operation without impairing the safe and efficient running of the system, although at first sight it would appear to me that the number of European Foremen and Workshop Artisans is unduly high. In view, however, of the expressions of opinion of the Heads of Departments and their expert knowledge of the subject, it would be impossible for an ordinary layman to ignore their advice.

Takoradi Harbour. – I was originally of the opinion that the number of European posts in this department was particularly high especially as regards the number of Pilots, Tug Masters and Tug Engineers employed. In view, however, of the expression of opinion by Mr. Whitfield on this subject I do not stress the point but I still consider that the question of the number of Pilots, Tug Masters and Tug Engineers employed should be continually before the Authorities in order to bring about any economies possible. With the limited amount of shipping using the Harbour it would seem that the existing European staff can only be partially occupied in carrying out their duties. To me it is very significant that it has not been found possible to make any reduction in the European appointments of this Department.

The Committee were informed that Tanganyika and Nigeria already possessed schemes of that kind. The General Manager of the Railway was definitely opposed to any change in the existing pension system as regards the Gold Coast Railway, but two members felt that the possibility of introducing a Provident
Fund on a pound for pound contributory basis merited careful consideration by Government.

86. The Committee had before it no figures or other data upon which to found a firm recommendation and, as at present advised, the majority of members felt that no strong case had been made out in favour of the proposal. At the same time it was agreed that the matter should be commended to Government for due consideration as opportunity offers. In this connection Mr. Korsah desired to record his conviction that any attempt to discriminate between the European and African staff would be bitterly resented by the country. All members of the Committee shared this view.

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89. The Committee was informed that a pronounced loss was expected on the current year’s working. The Chairman inquired whether any member wished to raise the question of closing this line. Members were unanimous in the opinion that the time had not arrived for the consideration of such a step.
OTHER MISCELLANEOUS SUGGESTIONS.

90. The Committee received some written suggestions from Mr. H. S. W. Shaul: The Committee is unable to endorse Mr. Shaul’s suggestions that a railway line should be constructed from Accra to Takoradi or for flat rates over the Railway for imports and exports irrespective of length of haul.

The Committee agreed with the General Manager’s opinion that seaside excursions from Ashanti would not prove to be a remunerative form of traffic and that neither the financial situation nor the probable volume of traffic that would result justified an experiment in door-to-door service being made at the present time. Mr. Shaul’s other suggestions are dealt with in the course of this Report.

Accounts. – The question of the abolition of this Section and to hand over the functions of this Department to the Customs authorities should be pursued as a substantial economy of £1,700 per annum can be effected thereby.

Takoradi Salaries. – I do not agree with the views expressed on page 10 of the Report and consider that the extra emoluments given to certain officers for duties performed in the ordinary course of their employment and charged against Takoradi Harbour expenditure are not justified and should be abolished on the termination of the appointments of the existing holders. This view was taken by me at the meetings of the Committee and I still maintain it.

FINANCIAL POLICY.

I am in general agreement with the remarks embodied in the Report and wish to emphasise that in my opinion the Capital Charges as at present allocated between the Government and the Railways is an unfair burden on the Railway system and one that is not justified. As has been pointed out in the Report at present the fixed charges for Loan Interest, Sinking Fund, etc., absorb the huge sum of £631,000 before anything is earned by the Railway. And when it is realised that the estimated revenue for the year 1932 is £810,000 it can be readily appreciated what an impossible burden is placed on the Railway system if it is expected to earn sufficient to pay all working expenses and overhead charges. To do this or anything approaching it uneconomic Railway freight charges are bound to ensue as is the case particularly with regard to that part of the system operating in Ashanti and to the manganese mines. The rates charged on the haulage of cacao from Ashanti and manganese from Nsuta are excessively high and constitute a burden on these two essential industries from which the Government derives considerable revenue. The rates charged compare most unfavourably with rates charged on other Railway systems operating in West and South Africa and in actual practice amounts to subsidization of the Railway at the expense of these
two industries whilst the rest of the Colony contributes a negligible part. It is therefore in my opinion essential that the Loan Charges as at present payable by the Railway system are drastically revised, so as to permit of economic rates being charged. The Railway system has in the past been materially responsible for the development of the country generally, and from that point of view has been an invaluable asset to the country. The time has now arrived however when a much broader view of the problems which the Railway is faced with have got to be taken, if the future material development of the Colony is taken into consideration. The existing capital value of the Railway system is also another problem which has got to be faced and is no doubt interwoven with the future financial policy of the Railway system. I am therefore in accord with Mr. Millar’s views that something has got to be done in this connection.

I am totally opposed to an increase in the licence fees paid by lorry owners as was suggested at the meetings of the Committee, particularly as regards Ashanti, as already I consider the community in Ashanti are made to carry an unduly high share of the cost of Railway transport and any additional taxation in this direction must react to the detriment of motor transport which is already a heavy charge owing to the long distances over which produce in Ashanti has to be hauled.

I am emphatically of the opinion that it is essential that the emoluments of all Railway employees are reduced immediately so as to permit of a reduction of 10 per cent of the total emoluments paid as soon as possible. This reduction may be temporary or permanent according to the future working results of the system and should be on a graduated scale so that the lower the salary paid the less will be the cut.

At the Committee’s meeting, I favoured the formation of an absolutely independent commission consisting of two Railway experts and a Financial Adviser to thoroughly investigate the problems of the Railways as they exist to-day and for the future. This proposal was not looked on with favour by other members of the Committee but I still consider it is of paramount importance.

The outlook for the Railways as at present constituted is not bright and it would appear that it might become a heavy burden on the general revenue of the Colony; and for that reason I consider that every possible avenue should be explored in order to bring about further economies and avoid the heavy losses which at present appear inevitable. For these reasons I reiterate my opinion that it is incumbent on the Government to appoint an independent commission of experts to investigate the problems the Railway is faced with.

Whilst I consider the Committee did useful work in its recent investigation I consider that from the very nature of its constitution it had a task that was beyond its capabilities. With the exception of the General Manager there was not a single member of the Committee who could profess to be au fait with
Railway matters and hence they were unable to bring any expert knowledge to bear on the problems before them. It might well be that the present Railway system when examined by experts would be drastically altered but it would be only through such an examination that such a decision could be arrived at. It is quite beyond the capabilities of any locally-formed committee.

[...]

M. G. LEWIS.

1st December, 1931.

APPENDIX II.

The Gold Coast Chamber of Mines,
Nsuta, 26th October, 1931.

RAILWAYS AND HARBOUR FURTHER RETRENCHMENT COMMITTEE.

SIR,

In response to the notice appearing in the British Official Wireless Service on the 19th instant and other dates, we have the honour to inform you that we desire to place our views before this Committee. We submit that:

1. The costs of public works such as pioneer railways, harbours, etc., built with the object of opening up the Colony or for the benefit of the community in general should be chargeable to the consolidated revenues unless and until such works can earn sufficient revenue to cover these costs without charging rates for their services in excess of those prevailing in countries which compete with the exports of this Colony.

2. The Gold Coast Railway, for the past 12 or 13 years, has occupied the position of a commercial undertaking. It has functioned almost exclusively as a carrier for the commercial and mining interests and derived its revenue from them, and in order to carry out these obligations economically and efficiently, it must be organized and conducted on modern commercial lines.

3. Takoradi Harbour is covered by paragraphs 1 and 2 in that it was built for the benefit of the Colony in general and is essentially a commercial project. Without imposing prohibitive rates it cannot be expected to furnish sufficient revenue to cover interest charges on capital until the trade of the Colony increases sufficiently to provide a revenue for this purpose.

4. In elaboration of the foregoing propositions, we further submit:
(a) The railway was first built from Sekondi to Kumasi at a time when it was impossible to foresee the subsequent development in cacao and manganese, and at that time would not have been undertaken by private capital.

(b) We believe it will be admitted that it was a pioneer railway intended chiefly to facilitate the administration and to facilitate the administration and to further develop the Colony, and the military necessities and the activities of neighbouring European powers furnished additional reasons for its construction.

(c) As the necessity for its construction was urgent the railway was built rather hurriedly. The lack of topographical information precluded the selection of the most suitable route, whilst the influence of climatic conditions and other considerations resulted in the construction of a pioneer line quite unsuitable for present-day conditions.

(d) When called upon to handle the increasing exports of the Colony it was found to be quite inadequate and had to be practically rebuilt throughout at a cost exceeding £1,240,000.

(e) The Central Province Railway, including surveys, cost £1,194,000 odd, and survey work for proposed railways appears to have cost more than £103,000. This was pioneer work intended to develop the Colony, and for many years could not be expected to furnish the revenue necessary to cover operating and interest charges without imposing excessive freight rates.

(f) The other lines of the Colony were built for a reasonably assured traffic, but they and the rebuilt line from Sekondi to Kumasi were called upon to pay interest, sinking fund and other expenses on the cost of this pioneer work, whilst the surplus earnings were paid into the consolidated revenue. In order to earn these revenues the railway was obliged to charge excessive freight rates which we regard as an unfair tax on the primary producer as they increase the cost of his product and handicap him in competing with the products of other countries.

(g) When the first sections of the railway were built an administration on lines much similar to other Government departments was established. At that time this may have been the most suitable form of control, but since the railway has become essentially a commercial undertaking, this form of administration is a serious hindrance to economical operation.

(h) All commercial undertakings must expect to encounter alternating periods of depression and prosperity and in order to cope successfully with these they must have a flexible organisation which can be readily adjusted to meet the changing conditions.

(i) On the 31st of March last the Railway personnel consisted of 166 Europeans and 4,845 Africans, a proportion of 29 to one. We understand some reduction has since been made in this number. The African appears to
be very well represented in the organisation. On the mines the average proportion is 40 to one.

(j) The salaries of all European officials except the General Manager are, in our opinion, on too liberal a scale. This is especially so in the case of artisans, platelayers, etc., who are paid higher rates for permanent pensionable employment than those paid on the mines for non-permanent and non-pensionable engagements.

(k) Pensionable appointments should carry a smaller salary than non-pensionable, and this salary should be calculated on the amount paid plus the amount of pension.

(l) We regard the payment of a pension as objectionable, in that it frequently destroys initiative and enterprise in the recipient who becomes increasingly inclined to work for safety first and avoid responsibility.

(m) As an alternative, compulsory insurance on an approved endowment plan might be substituted. This would facilitate the operation of the railway on commercial lines.

(n) A group insurance scheme covering death or permanent disablement for all non-pensionable European employees and all European employees with less than 10 years service would not be expensive to operate. /

In conclusion we wish it to be understood that the foregoing remarks imply no criticism of the personnel of the Gold Coast Railway. The work they are now required to do has, in our opinion, outgrown the administrative system and we have pleasure in acknowledging the efforts they have made to carry on under very adverse conditions.

We have, etc.,

C. R. MILLAR, President,
for The Gold Coast Chamber of Mines.

[...]
THE BIRMINGHAM CHAMBER OF COMMERCE to COLONIAL OFFICE.
(Received March 24, 1905.)
[See to Foreign Office: No. 135.]

Sir,

Winchester House, Victoria Square, March 23, 1905.

With reference to your letter of the 7th June, 1904,* and to previous correspondence respecting the rates charged on the Beira and Mashonaland Railways, I am directed to transmit to you herewith, copy (in duplicate) of a report which has been unanimously adopted by the Council, and to ask you to be good enough to lay the same before the Colonial Secretary.

I am also directed to ask if the Colonial Secretary will be good enough to forward a copy to the British South Africa Company,† and to express a hope that he will use his best offices with the company with the view of inducing them to bring about a reduction of the present exorbitant rates charged for the conveyance of merchandise on the said railways.

I am further directed to call your attention to the representation of the Chamber, contained in my letter of the 31st July, 1903,‡ and particularly to that contained in my letter of the 8th December, 1903,§ which the Council desire should again be brought under the notice of the Colonial Secretary.

I am, &c.,

G. HENRY WRIGHT,
Secretary.

* 11561: not printed.
† No. 264 in African No. 717.
‡ No. 434 in African No. 717.
Enclosure in No. 75.

BIRMINGHAM CHAMBER OF COMMERCE (INCORPORATED).  

REPORT OF THE GENERAL PURPOSES COMMITTEE ADOPTED BY THE COUNCIL ON THE 15TH MARCH, 1905.

Beira and Mashonaland Railways.

On the 31st July, 1903, a representation was made by the Chamber to the Colonial Secretary with reference to the excessive rates charged for the conveyance of merchandise on the Beira and Mashonaland Railways, which it was urged operated as a serious hindrance to the proper development of trade and commerce of Rhodesia. A further letter on the subject was sent to the Colonial Secretary on the 8th December, 1903. The correspondence was transmitted by the Colonial Secretary to the British South Africa Company for their observations; and on the 7th June, 1904, the Colonial Secretary forwarded, for the information of the Chamber, copy of a Memorandum prepared by the Mashonaland Railway Company, Limited, which had been sent to him by the British South Africa Company as a reply to the representations of the Chamber. This Memorandum was laid before your Committee, who instructed the Secretary to forward a copy to traders in Rhodesia, and to ask for their observations thereon. These have now come to hand and have been carefully considered by your Committee.

The documents connected with the case are too lengthy to admit of reproduction in this report, but the following shorter statement of the facts and arguments will probably be sufficient to enable the Council to come to a conclusion on the matter.

Merchandise is carried into Rhodesia principally by two routes, viz.: from Port Elizabeth, in the south, and from the Portuguese port of Beira, on the East Coast of Africa. The distance from Port Elizabeth to Gwelo is 1,313 miles, whilst the distance from Beira is only 562 miles. It should be remembered that Gwelo is the meeting point of the southern and eastern railway routes. The complaint of settlers is that although Beira is the natural port of Rhodesia, the rates on the Beira and Mashonaland Railways are fixed at such a level as to make the total cost of conveying merchandise from Beira approximately equal to the total cost of conveying the same from Port Elizabeth. In other words, the rate per ton per mile from Beira to Gwelo is more than double the rate per ton per mile from Port Elizabeth. This is admitted by the Mashonaland Railway Company, who state that the arrangement was entered into by Mr. Rhodes at the request of the people of Rhodesia. The present traders of Salisbury Rhodesia do not admit this,
as they contend that the rates were fixed purposely in order to divert Rhodesian traffic on to the long line from the south. The Mashonaland Railway Company do not attempt to prove their assertion by any documentary evidence, whilst the Rhodesian traders quote a speech delivered by Mr. Rhodes at Port Elizabeth on the 17th September, 1898, just after the Beira Railway had reached Salisbury, from which it seems clear that Mr. Rhodes definitely intended that the Beira and Mashonaland Railways should not enter into competition with the railways entering Rhodesia from the south. In this speech Mr. Rhodes said: ‘It is one of the greatest mistakes for a man to work competing railways; he cannot afford the competition and will probably be working at a loss’. Later on in the same speech he said: ‘I have arranged the railways to the north so that whatever trade we have in the north will have to come through this port, i.e., “Port Elizabeth.” ’ This speech would appear to your Committee to refute the statement of the Mashonaland Railway Company that the arrangement respecting rates was entered into at the request of the people of Rhodesia.

In their Memorandum the Mashonaland Railway Company admit that it is unquestionably true that the base rates on their railways are high, but contend that they are justified by the conditions under which the railway systems were constructed and are worked. Your Committee are prepared to admit that some of the arguments of the Mashonaland Railway Company are reasonable, but from information that has been received from Rhodesia it appears that other arguments are not so well founded.

For instance the high cost of construction is put forward as one of the conditions justifying the high rates. Your Committee are informed that the cost of constructing the broad-gauge line from Beira to Salisbury was about £8,900 a mile; whilst the first 2,250 miles of railway built in Cape Colony averaged £8,580; the Delagoa Bay line £9,000, and the Natal line £11,317 per mile. Again the Mashonaland Railway Company refer to ascending gradients and numerous sharp curves in the railway as conditions resulting in unusually high working costs. Your Committee are informed that so far as physical obstacles are concerned the ascent of the inland plateau has to be faced by every line round the South African coast, and that the most gradual ascent of all is that on the Beira line, on which there is a rise of 3,700 feet at Umtali in a distance of 200 miles. On the Cape Town line there is a rise of no less than 2,400 feet in 36 miles up the Hex River Pass, over the greatest part of which the gradients are 1 in 40 and 1 in 45, with curves of 5 chain radius. On the Port Elizabeth line there is a rise of 5,200 feet in the first 263 miles, while from East London the railway reaches an elevation of 5,600 feet at 207 miles from the coast. The Natal line is said to be the steepest and most tortuous in South Africa, not more than 47 miles of the main line being on the level; in some places the gradient is even 1 in 30, and the curves as sharp as 40 feet radius; the rise in the first 58 miles amounts to over
3,000 feet. On the Delagoa Bay line similar difficulties occur; indeed, so steep is
the ascent of the Elandsberg from Waterfall Onder that the ordinary rails have
to be supplemented by a cog rail. With this information before them your Com-
mittee are of opinion that the cost of construction, maintenance, and working
due to the gradients and curves on the Beira and Mashonaland Railways should
compare favourably with the costs on the other South African Railways, and that
the conditions in this respect do not present any strong argument in justification
of the present excessive rates.

Another argument adduced in justification of the high rates is the sparsity
of populations along the whole route of the railway, resulting in traffic of very
limited dimensions; but the Rhodesian traders point out that in this respect the
Beira Railway is no worse off than the more expensive Delagoa Bay line; and yet
the rates per ton per mile on the former are two and a half times as high as those
charged on the latter railway.

Furthermore, the Rhodesian traders state, as a final reply to the argument
that the high rates on the Beira and Mashonaland Railways are due to high
working costs, that it is instructive to compare these costs with those of the Rho-
desian railways in Matabeleland, from which, taking the figures given in the
recently published reports of the two railway companies for 1903, it is found
that the gross cost per train mile on the Rhodesian railways was 9s. 2.7d., whilst
on the Beira and Mashonaland railways it was only 9s. 3.4d., or practically the
same amount. Yet, notwithstanding this, the high rates on the latter line for 1st
class goods are 75 per cent. higher, and those for 2nd and 3rd class goods about
100 per cent. higher.

An important feature of the Memorandum of the Mashonaland Railway
Company is a comparative statement purporting to show the landed cost and
the actual local price of the approximate amount of imported food consumed
annually by a single man in Salisbury. This statement was prepared in reply to
the Chamber’s contention that the effect of the high railway rates is unduly to
increase the cost of living. For the purpose of this statement 15 articles are taken
and the following result is obtained:–

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
<th>s</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost in London, f.o.b.</td>
<td>23</td>
<td>8</td>
<td>11½</td>
</tr>
<tr>
<td>Freight to Beira</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Beira. Landing charges, transit, duty, &amp;c.</td>
<td>3</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Railway rate to Salisbury</td>
<td>7</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Landed cost at Salisbury</td>
<td>36</td>
<td>11</td>
<td>2½</td>
</tr>
<tr>
<td>Local price</td>
<td>53</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Merchants’ profit per cent</td>
<td></td>
<td></td>
<td>46.1</td>
</tr>
</tbody>
</table>

In a note it is explained that buying, commission and bank charges are not
included in the landed cost, and that by ‘merchants’ profit’ is meant the excess of
local sale price over cost price, which, it is explained, is not all profit, as working expenses, loss in transit, deterioration, &c., have to come out of it.

Your Committee considered this comparative statement to be of considerable importance, and a copy was therefore sent out to Rhodesia in order that a further statement should be prepared in respect of precisely the same articles and quantities. The Rhodesian traders availed themselves of the opportunity, and furnished your Committee with the desired particulars, the figures being taken from actual recent consignments, as recorded in the cost books of various local merchants, with the following result:–

<table>
<thead>
<tr>
<th></th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original cost, including commission, bank charges, &amp;c.</td>
<td>24</td>
<td>14</td>
<td>7 ¾</td>
</tr>
<tr>
<td>Freight to Beira and landing</td>
<td>2</td>
<td>10</td>
<td>7 ¾</td>
</tr>
<tr>
<td>Beira forwarding charges and transit duty</td>
<td>1</td>
<td>14</td>
<td>7 ¾</td>
</tr>
<tr>
<td>Railway rates</td>
<td>8</td>
<td>4</td>
<td>2 ½</td>
</tr>
<tr>
<td>Customs clearance and delivery from station</td>
<td>1</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>Landed cost at Salisbury</td>
<td>39</td>
<td>0</td>
<td>8 ¼</td>
</tr>
<tr>
<td>Local price</td>
<td>49</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Merchants' gross profit per cent.</td>
<td></td>
<td></td>
<td>26.6</td>
</tr>
</tbody>
</table>

It will be observed that there is a considerable discrepancy between the two statements, and the Rhodesian traders give an explanation as to how the discrepancy arises. For instance, the Mashonaland Railway Company’s figures purport to show that the merchants’ gross profit on bread is 127 per cent. The landed cost at Salisbury of 365 lbs. of bread is stated to be £2 13s. 7 1/2d., and the local price to be £6 1s. 8d. From information furnished by Rhodesian traders it is evident that the former figure represents the landed cost of 365 lbs. of flour, whilst the latter is the sale price of 365 lbs. of bread. So that the comparison is obviously irrelevant, especially when it is also considered that in stating the sale price nothing has been allowed by the Mashonaland Railway Company for the cost of other ingredients and for the labour and other expenses incurred in making the bread. Other defects in the railway company’s statement are made apparent by the Rhodesian traders. For instance, in the case of sugar the cost of freight (as evidenced by the amount paid on an actual consignment) is understated, whilst the sale price is given as 5d. instead of 4d., which, in itself, represents a discrepancy of 20 per cent. Further, in the case of rice, the Rhodesian traders state that the Railway Company have calculated the prime cost and carriage on the common quality of rice, which is imported in large consignments in bags direct from India, whereas the selling price given is that of best Patna, usually imported from England in small quantities, and often in tins. Again, in the case of pepper and mustard, the cost of carriage / appears to have been much under estimated, whilst the sale price is given at 4s. as against the actual price of 2s. 6d. per lb. It may also be remarked that the omission of such charges as buying, commission,
cost of cases, bank charges, and delivery from station, tends to vitiate the result shown in the statement of the railway company.

The Rhodesian traders’ statement shows a gross merchant’s profit of 26.6 per cent., but they state that from estimates that have been prepared it is found that the average cost of distribution in Salisbury, including a small percentage for irrecoverable damages in transit, comes to about 20 per cent. on the landed cost of the goods, which estimate is believed to be rather below than above the mark. Taking the figures, however, as given, it is seen that by selling at retail prices the Rhodesian trader in groceries obtains a profit margin of only 6 1/2 per cent., which, it is contended, is really insufficient to meet such additional items as depreciation, bad debts, and ordinary trade risks. It must also be remembered that in the case of contracts and large orders the sale price is appreciably lower, and still further reduces the net profit of the Rhodesian trader.

Your Committee submit that the details which have been set forth above show, first, that the excessive railway rates charged are not justified by the high working costs; and, secondly, that the contention of the Mashonaland Railway Company that the Rhodesian trader is making exorbitant profits is not well founded.

On the contrary, it is clear from the statement in the railway company’s memorandum, as to the arrangement made by Mr. Rhodes that the object of maintaining the present exorbitant rates is to encourage traffic from the south for the benefit of the Southern Rhodesian railways. The effect of this is to deprive Rhodesia of the advantages which ought to accrue from the natural port, Beira. The discrepancy in the rates from the south as compared with Beira is seen in the following comparative statement, which is given in the Mashonaland Railway Company’s Memorandum. The rate for the carriage of mining machinery from Beira to Salisbury, 374 miles, is £9 15s. 0d. per ton; on the Central South African Railways it would be £5 15s. 0d. per ton. The weight of a 40-stamp mill and of all material for buildings, &c., in connection therewith, would be approximately 900 tons, and nearly all this material would be carried at the rates named. The carriage, therefore, from Beira to Salisbury would be £8,775, whilst for a similar distance on the Central South African Railways it would be £5,175, or £3,600 less. The railway company say that this difference would not appreciably affect a mining company which intended to put up a 40-stamp mill. Your Committee cannot agree with this. Furthermore, it must be remembered that similar differences exist in the carriage of most other articles of merchandise which have to be bought and paid for by the smaller consumer; and it cannot, therefore, be seriously denied that the high railway rates do appreciably restrict Rhodesia’s purchasing power, and do unduly increase the cost of living. Your Committee do not, as the Mashonaland Railway Company appear to think, contend that railway rates alone are responsible for the high cost of living in Rhodesia, but
they do contend that when the rates from Beira, the nearest port to Gwelo (562 miles) are as high as the rates from Port Elizabeth (1,313 miles), then the settlers of Rhodesia are deprived of something which ought in the nature of circumstances to be theirs. According to the Mashonaland Railway Company’s statement the railway rates on foodstuffs for consumption in Salisbury represent 25 per cent. on the landed cost of the goods at Beira, and this, in the opinion of your Committee, is excessive.

The Mashonaland Company, in another part of their Memorandum, contend that reductions in railway rates can only go hand in hand with the development of the country, and the increase in its populations; whilst, on the other hand, the Rhodesian traders believe that cheap transport is a necessary forerunner to healthy colonization and industrial development. With the latter view your Committee are in entire accord.

Your Committee believe that sufficient has now been said to show that Rhodesian traders suffer considerably in consequence of the railway policy adopted by the Beira and Mashonaland Railway Company, and it only remains now to point out that the high rates re-act injuriously on British exports to Rhodesia, because it must be evident that anything which unduly restricts purchasing power restricts also the sale of goods. This applies, of course, not only to foodstuffs but also to mining and building material, stores, ironmongery, hardware, domestic articles, &c. /

Your Committee recommend that a copy of this report be sent to the Colonial Secretary; that he be asked to transmit a copy to the British South Africa Company, who are not only responsible for the good government and development of Rhodesia, but also are practically the owners of the railways; and that he also be asked to use his best offices with the Company with the view of inducing them to bring about a reduction of the present exorbitant rates in order that the people of Rhodesia may have the advantages which should accrue to them from the possession of a line of railway following the nearest route to the sea.

G. Henry Wright,
Secretary.
Birmingham, March 23, 1905.
No. 97.

UGANDA.

THE GOVERNOR to THE SECRETARY OF STATE.

(Received 23rd April, 1914.)

(Confidential.)

Sir,


I have the honour to inform you that the Governor has had under consideration the question of the amalgamation of the Uganda Protectorate Railways with the Uganda Railway on a basis which would allow of a uniform administration, and would at the same time secure to the branch railways in this Protectorate that measure of financial support from the parent line which is properly due to them.

2. The administrative advantages which would be secured by amalgamation are scarcely open to question, and need only be referred to briefly in order to be recognized. The existence of one central administration under a single administrative head ensures economy in time in referring matters to the central authority, and uniformity of policy over the whole system. It greatly simplifies the assimilation of rates and fares throughout, and offers much greater facilities for the quotation of special through rates. It enables the whole accounting business of the railway to be conducted under one administrative control, with a uniform system of forms, regulations, etc., and avoids the necessity of complicated clearing house operations between the various branches. It secures the advantage of a single staff, with uniformity of pay and regulations, the members of which can be posted by the central authority, to the advantage of the system as a whole. Moreover, the free interchangeability of rolling stock over a whole system permits of the rolling stock available being utilized as required to meet
seasonal or other variations of traffic in the various parts without the necessity of providing separately for the branch lines. These are only a few of the advantages which occur to me. Doubtless there are many others which might be adduced by those more competent to speak on railway administration.

3. The financial basis of amalgamation is, however, a matter of some difficulty, which calls for careful consideration. This question has been reviewed in some of its aspects on former occasions, and it will be convenient if I may refer briefly to what has already passed germane to this subject.

4. Sir Hesketh Bell\(^1\) in paragraphs 14–16 of his Confidential despatch of the 20th January, 1908,\(^*\) forwarding the draft Estimates for 1908–09, raised the question of securing for Uganda a proportion of the profits of the Uganda Railway, but Lord Crewe in paragraph 5 of his dispatch, No. 206, of the 26th August, 1908,\(^†\) replied that he was unable to view the proposal with favour. The question of the status of this Protectorate in relation to the railway system was more fully considered, in connexion with the construction of the Busoga Railway, in Sir Percy Girouard’s\(^2\) despatch to the Colonial Office, No. 218, of the 16th April, 1910, and his Confidential despatch of the 12th May, 1910, and Mr. Tomkins’s despatch, No. 142 of the 26th April, 1910.\(^‡\)

5. In his despatch of the 12th May, 1910,\(^§\) Sir Percy Girouard lays stress on the fact that the railway system is the backbone of the two Protectorates and should be operated for the combined advantage of both. With this statement I can only express my entire concurrence, but he proceeds to argue further that the East Africa Protectorate is entitled to the entire profits on the Uganda Railway system, on the ground that that Protectorate has been responsible financially for the parent line and has been obliged to bear the loss incurred in its working during the earlier years of its existence; with this I am not in accord, as Sir Percy Girouard’s argument ignores the fact that the construction of the Uganda Railway was undertaken as much, if not more, in the interests of Uganda for the development of the hinterland, than on behalf of the East Africa Protectorate, and that that Protectorate, as he himself admits, has contributed no more than Uganda towards the charges on the original grant which, I understand, have been met from Imperial funds, free, so far as East Africa was concerned, from all charges for interest and sinking funds.

6. I do not wish, however, to discuss this aspect of the question in the meantime but that of the amalgamation of the railway and marine services of the two Protectorates, and in this I am in full accord with Sir Percy Girouard’s main contention that the railways in both Protectorates should be worked as a

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\(^*\) No. 5 in African No. 895.
\(^†\) No. 36 in African No. 895.
\(^‡\) Nos. 136, 176 and 142 in African No. 951.
\(^§\) No. 176 in African No. 951.
homogeneous system, under a single administration, for the combined interests of both. The treatment of existing and future lines as extensions of the Uganda Railway system is the principle adopted by Mr. Winston Churchill in his Confidential memorandum, African 862, dated 30th November, 1906, which formed an enclosure in Lord Elgin’s Confidential despatch of the 21st December, 1906,** and is, in my opinion, the only sound method of dealing with the question.

7. The position at present is that the Uganda Protectorate is called upon to bear the loss incurred in running feeder lines, while the East Africa Protectorate reaps the benefit of the additional profits to the parent line which result from the increased traffic supplied by the feeders. That is to say, the Uganda Protectorate pays for the more expensive parts of the system, whilst East Africa reaps the benefits which are received by the system as a whole. Such a position is plainly unfair to Uganda, and if this policy is allowed to continue it must inevitably block the way for future development, as this Protectorate would obviously be unable to bear the charges for interest and sinking funds on future extensions, which would undoubtedly be run at a loss during their earlier years, unless afforded some assistance from the parent line in return for the increased traffic brought in.

8. This aspect of the question was recently discussed by the Governor in conjunction with the General Manager of the Uganda Railway, whose views are expressed in a letter and memorandum copies of which are enclosed. A copy of a memorandum by Mr. Eastwood, Chief Accountant to the Uganda Railway, containing alternative proposals is also enclosed together with a copy of a minute by the Treasurer of this Protectorate suggesting a system of contribution from the Uganda Railway revenues based on a different principle.

9. The main outlines of the proposals submitted are briefly as follows:–

(a) Mr. Taylor proposes that funds for the construction of branch lines in this Protectorate should be arranged for by Uganda, interest during construction being debitable to capital; the lines to be worked on the same percentage of working expenses to gross earnings as the whole system, the Uganda Railway as home line, to guarantee such minimum net revenue as will meet charges for interest and sinking fund on the capital cost of the branch without expense to Uganda, and to pay such further revenue as may be received from the net earnings of the branch in excess of these charges.

(b) Mr. Eastwood proposes that the Uganda Railway should meet the interest on loans for the construction of the branch lines, but that this Protectorate should bear its own working expenses and sinking fund, and receive the profits or meet the loss incurred in running the branches in Uganda.

(c) Mr. Smith suggests that neither of the foregoing proposals go far enough, but that this Protectorate should receive an annual contribution of at

* 44909: not printed.
least £50,000 from the revenues of the Uganda Railway, but that charges for interest and sinking fund should be met from the revenue of this Protectorate.

10. The General Manager’s proposal contained in 9 (a) commends itself to me as being the most equitable in the interests of both Protectorates, and as most likely to afford the necessary amount of assistance towards future development. Under it the Uganda Protectorate funds would be protected from loss during the unproductive years which must be expected in the early stages of the development of branch lines and would benefit by their net earnings when a profitable stage was reached.

Mr. Eastwood’s proposal in 9 (b), though it might eventually result in greater gain to the revenues of this Protectorate, and would, perhaps, be more advantageous if only the existing branch lines are to be considered, appears to offer the disadvantage that Uganda would be hampered by being obliged to bear the considerable loss on actual working which might be expected in the earlier years of the more considerable extensions of the system which are in contemplation. / The suggestions made by Mr. Smith in 9 (c) present some difficulty, as they depend upon the admission of the principle that part of the profits of the Uganda Railway should accrue to this Protectorate, a point which is referred to in paragraph 4.

11. I recommend, therefore, that the Busoga Railway be absorbed in the Uganda Railway system, on the basis of Mr. Taylor’s proposals, with effect from the 1st April, 1914, and that the Kampala-Port Bell Railway be similarly absorbed, either on that date or as soon as completed; the same principle to be followed in the case of all future extensions.

12. I have not as yet discussed this project with the Governor of East Africa, but in order that an expression of his views may be received at an early date, I have caused a copy of this despatch to be forwarded to him.

13. In conclusion, I may add that this despatch deals more particularly with the amalgamation of the railway services. The amalgamation of the marine services is dealt with in the correspondence terminating with your despatch, No. 596, of the 23rd December, 1912,* with exception of the Albert Marine, which must of necessity remain a separate service until Butiaba on Lake Albert is connected by rail with Masindi Port on Lake Kioga. It is proposed, however, that the Lake Kioga Marine Service should be treated on the same lines as the railways as part of the complete system.

I have, &c.,

H. R. WALLIS,*
Governor’s Deputy.

* 39308: not printed.
Enclosure 1 in No. 97.

(Confidential.)

Uganda Railway, General Manager’s Office, Nairobi.

24th February, 1914.

Amalgamation of Railways and Marine Services,
East Africa and Uganda.

Sir,

I had the honour of an interview with His Excellency on my visit to Uganda last month, and the matter was brought up of the amalgamation of the railway and marine services of the two Protectorates, and His Excellency desired that I ask Mr. Eastwood to put up a memorandum on the subject.

2. I enclose copy of a memorandum compiled by me after the interview with His Excellency on 5th January, and I also enclose copy of a memorandum compiled by the Chief Accountant.

3. It will be noticed that Mr. Eastwood goes much further than I, and his proposal is that the Uganda Railway pay all interest on loans, and that any profit on working the several branches go to the respective Protectorates owning the sections.

4. Personally, I am of opinion that the whole working and financial control of the railways and marine services be under one administration, and that the railways and marine services in Uganda be worked as branches of the Uganda Railway, on similar terms as are granted in India.

5. The local Government to arrange for funds for railway construction, but the work to be carried out under the direct control of the General Manager of the Uganda Railway, and the home line to guarantee the loan charges. During construction interest to be debitable to capital.

6. The working arrangement to be that the home line work the branch as part of the system on the same percentage of working expenses to gross earnings as the whole system, and guarantee a minimum net revenue as will meet the charges for interest and sinking fund on the capital cost of the branch, and such further revenue as the net earnings of the branch may exceed these charges.

7. I certainly consider that the amalgamation of the railway service should be arranged for at once on some such basis as outlined above. I understand that before the amalgamation of the two Nigerias that Southern Nigeria guaranteed the interest on railway loans in Northern Nigeria.

I have, &c.,

H. B. Taylor,
General Manager, Uganda Railway.
To the Chief Secretary of the Government. Entebbe, Uganda. / (Confidential.)

Amalgamation of Railways and Marine Services, East Africa and Uganda Protectorates.

His Excellency Sir Frederick Jackson discussed with me the question of the amalgamation of the railways and marine services of East Africa and Uganda.

He stated that the matter had been brought up before by him with the late Mr. Currie, and the matter was to have been gone into at home when they were both on leave, but unfortunately Mr. Currie’s death prevented this.

His Excellency also told me that the matter had been talked over by him with the Chief Accountant, Mr. Eastwood.

The Governor’s opinion is that the full control of the railway and marine services be under one administration, and in this view I concur.

The railway and marine services in Uganda are really feeders to the Uganda Railway, and we get a large portion of our net earnings from the traffic brought to us by them.

The question was discussed of further extensions in Uganda.

One was from Masindi Port to Butiaba, from Mbale to the Lake, and a third extension of the Kampala Railway to the southern end of the Lake Albert. On my view being asked on these extensions I advocated that the only one I could recommend was the extension in the direction of Lake Albert, which I consider very promising indeed, as it ran into excellent country a very few miles from Kampala. In this view His Excellency agreed, and said that a few of the local officers whom he had confidentially consulted were of the same opinion, and he desired that, should this railway be constructed, the construction should be under the direct control of the Uganda Railway.

I do not think we can ask Uganda to spend money freely on such extensions unless the home line give some encouragement in the way of rebate. I certainly consider that the least we should offer is that we work these lines on the same percentage receipts as the whole concern. It is not right that these feeder lines should be worked at a loss to the Uganda Treasury.

The question, of course, is one in which the Government of East Africa is intimately concerned, as at first there must be some slight loss on the working of these feeder lines, but the advantage in the free working of the railway and marine services being absolutely under one financial control is very great indeed, and it will certainly tend to the Uganda Protectorate encouraging branch lines if such terms can be offered by the home line.

The branch line terms in India are: interest is chargeable to capital during construction, and that after the line be opened to traffic the home line work the branch on certain systems, either of guaranteed interest on capital or rebate on the traffic brought to the main line by the branch line.
At present our railway loans bear interest at 3 1/2 per cent., and have a sinking fund at 1 per cent., and I am of opinion that the home line can well afford to guarantee at once the loan charges, and more still, should the whole system earn more than 4 1/2 per cent. This should give great encouragement to Uganda borrowing money for railway extensions. But I consider it most unfair to ask a new country to establish a sinking fund for a productive work like the railway service, which is always kept up to date and in thorough order, at the expense of revenue. It is hard that when a country is just fighting its way it should be doing so much for those who are to come hereafter – some thirty to fifty years hence.

Of course Uganda benefits by the opening out and development of its country in like manner as East Africa benefited the Uganda Railway, which should be considered as a joint railway and not solely as a gift by the English nation to the East Africa Protectorate, for, beyond the minor loans for which East Africa is now financially responsible, the revenue account bears no charge for interest on the main capital cost.

This guarantee of interest on branch lines of course can only be for such extensions as have the approval of the main line authorities, but no doubt the Secretary of State would take control and see that only such lines be constructed in the future which would be directly or indirectly remunerative.

His Excellency informed me that he had been asked by the Secretary of State regarding various extensions in regard to roads and railways, and he had put forward these suggestions, which he hoped East Africa would favour.

Nairobi,
February, 1914.

H. B. Taylor,
General Manager, Uganda Railway.

Memorandum.
(Private and Confidential.)

Uganda Railway, Chief Accountant’s Office, Nairobi,
17th February, 1911.

Amalgamation of Railways and Marine Services, East Africa and Uganda.

The desire of the Uganda Administration is that they should receive some proportion of the profit earned by the traffic they bring to the Uganda Railway, and also assistance in building railways in Uganda.

From a railwayman’s point of view there can be no question as to the desirability and benefits to be gained by the amalgamation of the different services. It spells economy in working, the enlargement of both railway and marine services,
an ever-increasing area of revenue-earning country, a larger available supply of labour, and, most of all, a rising and constant revenue for both Protectorates.

East Africa has the Uganda Railway and the Thika Branch, costing up to the present time, including loans now under expenditure, some £6,600,000. This cost includes also the Uganda Railway Marine on Lake Victoria. Of the amount of £6,600,000, interest is payable upon £535,000 only, the remainder being either the Uganda Railway original grant of £5,550,000, or the amounts that have been passed yearly in the expenditure votes of the East Africa Protectorate.

The Uganda Protectorate have 62 miles of line on the Busoga Railway, seven miles on the Kampala-Port Bell line, a flotilla on Lake Kioga, and steamers on both Lake Victoria and Lake Albert. The total cost is about £250,000, of which £200,000 bears interest at 3 1/2 per cent. and a sinking fund of 1 per cent. Uganda trade has no outlet except the Port of Mombasa, and, consequently practically all traffic, both exports and imports, has to be taken 750 miles to or from the Protectorate to the nearest port of shipment. This means that the Uganda Railway have their maximum mileage charges on all this traffic, and, except in the case of country produce and low freight commodities, such as cotton, it yields a fair profit. But it must be remembered that Uganda pays nothing towards the cost of working the traffic, nor of the expenditure that has been incurred in terminal facilities at the coast port, and on which expenditure involving millions sterling must be incurred to meet the development of the two Protectorates. Uganda has not even provided the port accommodation required in its own territory, and it therefore does not appear either just or equitable that it should derive any share in the profit earned on that part of the railway system that is outside its own territory or jurisdiction. But although it does not appear right that it should not receive part of the profit, there is no reason why the parent line should not assist the Uganda Protectorate in the development of its railways, and by so doing help not only Uganda, but also East Africa, by the increased revenue that must inevitably occur by increased accommodation and facilities.

The way in which it could assist would be by guaranteeing the interest upon any loan that might be raised for the construction of railways or works in connexion with them.

The line in Uganda that is considered most advisable is the line to the southern end of Lake Albert. This not only runs through good country, in which at the present time there is a very large porter transport that it would release, but it would also save the transhipments that would ensue in a line from Masindi to Butiaba. Such a line would be from 150 to 180 miles in length, and when the Nakuru-Mumias line is completed, an extension of about 120 miles from Mumias (?) to Kampala via Jinja would form a trunk line from Mombasa to Lake Albert.

The cost of the Kampala-Lake Albert line, with its equipment of rolling stock, terminals, workshops, etc., etc., should not be estimated at less than £1,000,000.
The Governor of Uganda to the Secretary of State

There would be required a flotilla on Lake Albert, at a cost of, say £150,000.
The present indebtedness is £250,000.
Add improvements on Lake Kioga and extension of flotilla, say £50,000.

£1,450,000 /

Interest on this at 3 ½ per cent. would be £50,750, or, say, in round figures, £50,000 per annum. It is not right that the parent line should bear the cost in another Protectorate of the sinking fund. A sinking fund of 1 per cent., invested at the commencement of each financial year, would repay the original loan in forty-four years, when the line would be free of all liabilities, the interest upon the loan would then cease and be available either as a guarantee for further loans or for an increase of revenue.

Our net revenue for the present year is estimated at £214,000; next year it is put at £330,000, and in view of the immense increase in traffic that would take place in putting all the country between the two lakes into direct communication with the railway, and also all of the country around Lake Albert, a yearly expenditure of £50,000 would more than repay itself within the first few years.

As regards the profit, or any profit-sharing scheme, I think the only equitable system would be for each Protectorate to take the part earned upon its own system. East Africa would bear the interest upon all railway loans, each Protectorate would bear its own working expenses and its sinking fund. It may be put forward that the Uganda Protectorate supplies a great deal of the traffic that contributes so largely to our revenue, but it must be remembered that if it were not for the railway Uganda would be a possession only, and not the probability of a large money-earning Colony.

With our present accommodation, and system, we estimate next year to earn £800,000, with a net revenue of £330,000.

The cost of the Uganda Railway at present is £6,600,000.
Requirements within the next five years, say £3,750,000.
Additional four berths at Kilindini, and a line from Mumias to Sio River £1,000,000.
Cost of Uganda Protectorate System, as given herein £1,450,000.
Additional Line, Sio River to Kampala and necessary equipment £750,000.
Estimated cost in ten years £13,550,000.
The revenue for the year 1914–15, may be divided as coming from:–

East Africa £400,000
Uganda £265,000
German East Africa £135,000
£800,000

East Africa, with its own development and new lines should treble itself in ten years £1,200,000.
The proportion derived from Uganda should at the very least treble itself in ten years £795,000.
Uganda Protectorate traffic on its own system should be at least a third of what it earns on the parent line £265,000.
German East Africa trade, add 50 per cent., say £200,000.
Total estimated revenue in ten years £2,460,000.
Allowing for the cost of interest on loans and sinking fund, put the working expenses at 75 per cent. This would give a net revenue, or profit, of £615,000, say, 4 1/2 per cent. upon the total cost, with the ultimate view that in less than fifty years all the system as proposed would be fully paid for, and there would consequently be an automatic increase in the revenue of over £400,000.

These proposals would eliminate the Uganda Railway Marine as a necessity for our present Uganda traffic, but they could be used for the expansion of trade around the Victoria Lake generally.

B. EASTWOOD.

Enclosure 2 in No. 97.

Memorandum.
(Confidential.)

1. The proposal for the amalgamation of the different services under the control of one Department should, I think, be adopted.

2. There are two statements made by Mr. Eastwood which, I think, should not pass unnoticed. The first is that the port accommodation in our own territory has not been provided by us. Although this is the case it should also be recorded that this Protectorate has spent, and is still spending, large sums directly for the development of trade and in providing steamers on Lakes Albert and Kioga, roads and other facilities for the transport of the traffic carried by the steamers to and from our ports on Lake Victoria, without which expenditure it is reasonable to suppose the large profits earned by the steamers would not have accrued. Further, it would seem unreasonable for us to provide port accommodation when we get no revenue from the traffic carried by the steamers, which, it should be noted, earn the bulk of their profits from trade with ports in the Uganda Protectorate. The second statement is that ‘if it were not for the Uganda Railway, Uganda would be a possession only.’ This of course, applies equally to the East Africa Protectorate.

3. As regards an extension of the main line as far as Kampala, I am of opinion that such an extension is not necessary and would be inexpedient. Steamer transport seems the natural means of transport from the east of Lake Victoria to Buganda.

4. As regards financial adjustments, it is difficult to foresee at present under what scheme this Protectorate would ultimately obtain a reasonable share of the revenue which will be derived from the traffic provided by it.

5. The railway loan charges for which this Protectorate is liable are:–

<table>
<thead>
<tr>
<th>Loan Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Busoga Railway Construction Loan</td>
<td>£170,000</td>
</tr>
</tbody>
</table>

Interest 3 ½ per cent, sinking fund 1 per cent. = 4 ½ per cent.
Kampala-Port Bell Railway Construction Loan = £30,000. Interest 3 ½ per cent., sinking fund 1 ½ per cent. = 5 per cent.

6. In addition we have to pay interest at 3 ½ per cent. and sinking fund at 1 ½ per cent. on a loan of £95,000 for improvements in communications in the Eastern Province. The whole of this sum is being spent on improvements which will bring traffic to the Uganda Railway, e.g., rolling stock for the Busoga Railway, lighters, piers and warehouses, roads, sudd-cutting, and telegraph communications.

7. The total charges on our present loans will amount in all to a sum of £13,900.

8. My view is that the Uganda Protectorate should receive an annual contribution from the revenues of the Uganda Railway, and that we pay interest and sinking fund on our loans and take the profits or bear the losses on the railways in our territory. If the principle holds good that the Uganda Railway revenue is utilized towards paying interest on large loans for terminal facilities at Mombasa, the same principle should apply to the smaller loans, such as the one referred to in paragraph 6, which provides equally important facilities in the Uganda Protectorate, whence, according to Mr. Eastwood’s memorandum, one-third of the revenue comes.

9. I do not think, therefore, either of the schemes proposed go far enough. No reference is made to this Protectorate receiving any portion of the profits from the Lake Victoria traffic, the bulk of which, as already stated, is earned on a part of the system which is inside the jurisdiction of the Uganda Protectorate. I think that an annual contribution of a sum of at least £50,000 from the funds of the Uganda Railway to those of the Uganda Protectorate would not be unreasonable, the amount of the contribution to be reconsidered after three years.

10. By accepting only the payment of interest and sinking fund on our railway loans, with the profits suggested either by the General Manager or the Chief Accountant, we should not obtain a reasonable share of the revenue from the main line, which I maintain should be used in just proportions for the development of both Protectorates.

G. D. SMITH,
Treasurer.
11th March, 1914.

Report of the Road-rail Transport Committee

Your Excellency,

We were appointed in April last a Committee to consider and report –

(a) whether in view of the importance of securing cheap and efficient rail and road transport services for both passengers and goods, the existing system by which restrictions are placed on road transport by the Carriage of Goods by Road Ordinance, 1936, should continue;

(b) as to what form of Government control over road services should be introduced so as to assist the development of cheap and efficient road transport, due regard being had to the public interest in the Railway, and to make recommendations.

2. We invited by public notice the submission of evidence and memoranda. The memoranda received are listed in the Appendix and represent a very limited response.

THE LOCAL ROAD-RAIL ISSUE

3. We do not consider it necessary to set out again the whole complex problem of co-ordinating railway and road transport; the comparative disabilities of a railway as a common carrier, with fixed rates, unable to carry from door to door, vulnerable to destructive competition from road transport, but yet an essential means of transport that must be paid for by its users; or the proper advantages of road transport for short-haul traffic, providing flexible and convenient services for both passengers and goods and giving a large amount of direct and indirect employment. These general principles of the problem have been set out often enough. The inevitable general conclusion that the development and operation of railway and road transport services should be controlled by a common repre-
sentative body in the interests of the users of both is found, on examination, to be idealistic to the extent that account has to be taken of actual local conditions and has for this reason to be whittled down to what is necessary and practicable under these conditions. The local situation in the Gold Coast is that as a result of the rapid expansion of road transport in the period following the last war and after examination of the problem by a Committee appointed in 1932 to consider what steps should be taken ‘in view of the serious losses suffered by the Railway during recent years mainly owing to road competition,’ the Carriage of Goods by Road Ordinance was passed in 1936. This Ordinance provides not for licensing but for the prohibition of the carriage of specified goods over scheduled roads. It has been applied so as to prohibit the carriage of cocoa to the coast by road and the carriage of imported goods and beer by road from the coast into Ashanti. There are 16 sections of road to which these prohibitions apply. They are equipped with barriers at which vehicles passing through are inspected and recorded by the Police. This system has now been in use for nearly ten years and in spite of the objections that can be raised to it in principle, in fact it works and is generally understood – and for that reason accepted.

4. During the war two developments have taken place that require mention. First, on account of the general shortage of vehicles, tyres and petrol, road transport has been placed under strict control and reduced in volume. The census taken in January, 1945, showed 3,800 lorries then licensed as compared with 5,000 in 1930. Nearly two-thirds of the present total are of pre-war manufacture. Two thousand eight hundred and fifty were licensed in the Colony and 950 in Ashanti and the Northern Territories. The purposes for which the lorries are used are:

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passengers and goods</td>
<td>2,533</td>
</tr>
<tr>
<td>Goods only</td>
<td>388</td>
</tr>
<tr>
<td>Logging</td>
<td>78</td>
</tr>
<tr>
<td>Contracting</td>
<td>71</td>
</tr>
<tr>
<td>Mining</td>
<td>54</td>
</tr>
<tr>
<td>Government and Town Councils</td>
<td>360</td>
</tr>
<tr>
<td>Miscellaneous; and insufficient information</td>
<td>316</td>
</tr>
</tbody>
</table>

In addition there are 79 ‘buses’, 41 of which are owned by Town Councils and 38 are owned privately.

It will be seen from the above that about two-thirds of the total number of lorries in the country are used for the general transport of passengers and goods.

The gross weights are:

<table>
<thead>
<tr>
<th>Weight Range</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 50 cwt.</td>
<td>180</td>
</tr>
<tr>
<td>50 cwt.</td>
<td>1,411</td>
</tr>
<tr>
<td>51–99 cwt.</td>
<td>572</td>
</tr>
<tr>
<td>100–110 cwt.</td>
<td>1,291</td>
</tr>
<tr>
<td>Over 110 cwt.</td>
<td>66</td>
</tr>
<tr>
<td>Insufficient information</td>
<td>280</td>
</tr>
</tbody>
</table>
5. The second development that has taken place is the standardisation of cocoa buying prices at all rail points and Senchi ferry. This system has been introduced as a part of the war-time machinery for the purchase of cocoa by the West African Produce Control Board. Since the producer thus gets the same price for his cocoa at up-country railway stations as he gets for it delivered to the port, there is no inducement to send it by road to the coast. The operation of this scheme by which the purchasing agency pays the transport differentials is not only of considerable benefit to the up-country producer: it also assures to the Railway the transport of the cocoa crop.

6. The cocoa crop is of vital importance to the Railway, as is shown by the following statement of goods revenue for 1943–44:

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bauxite</td>
<td>90,900</td>
</tr>
<tr>
<td>Manganese</td>
<td>149,405</td>
</tr>
<tr>
<td>Cocoa</td>
<td>391,517</td>
</tr>
<tr>
<td>Timber</td>
<td>50,208</td>
</tr>
<tr>
<td>Native produce</td>
<td>58,500</td>
</tr>
<tr>
<td>Petrol and oil</td>
<td>62,500</td>
</tr>
<tr>
<td>U.S.A. traffic</td>
<td>58,800</td>
</tr>
<tr>
<td>General goods</td>
<td>276,850</td>
</tr>
<tr>
<td>Livestock</td>
<td>10,225</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>£1,148,905</strong></td>
</tr>
</tbody>
</table>

The total Railway Revenue for 1943–44, including Coaching (£402,400) and Miscellaneous (£39,760), amounted to £1,590,975, of which total 25 per cent was goods revenue on cocoa. This percentage is likely to increase as passenger and other goods traffic is lost to road transport in the post-war period – a loss estimated by the Railway Management to amount to not less than £350,000 annually.

7. With the exception of certain areas in the vicinity of the ports, including the surf ports of Cape Coast and Winneba which the Government for its part has said that it is willing to operate if the shipping companies have the inducement to use them, there can be no justification for transporting cocoa by road to any destination other than the nearest rail point. We assume that the present system of standardised cocoa prices will continue, whatever form of controlled marketing is adopted, and if and when it is established for certain that it will continue it would be possible, without risk of loss to the Railway, to remove the present prohibition of the carriage of cocoa over the scheduled road sections. But that state of certainty has not yet been reached and until it is we recommend that the prohibition should remain.

8. We see no reason, however, to retain the existing prohibition on the carriage of imported goods or beer over the 10 road sections to which such a restriction at present applies. No one is likely to wish to transport beer over these sections
to any appreciable extent. But the present prohibition is absolute except with the permission of the Governor in Council. It may often prove desirable to use road transport for imported goods on these routes, and there is little reason to believe that this would cause any appreciable financial loss to the Railway, so long as there are no cocoa-lorries returning empty to pick them up. Such prohibitions are obsolete and unnecessary restrictions in present conditions, and we therefore recommend that in respect of the carriage of imported goods and beer they should be abolished.

9. The policy whereby in the past gaps were deliberately left in the system of road communications, so as to prevent competition with the Railway, has been abandoned.

10. In the case of a Government Railway such as the Gold Coast Railway, we hold the view that the well-known principle of rating according to ‘what the traffic can bear’ must give way to the importance, in the public interest, of charging the lowest possible rate consistent with efficient transport and the avoidance of subsidy from taxation. The Railway rates in the Gold Coast are distinctly high, and the aim should be to reduce them, but we recognise that the possibility of reduction depends mainly on the securing of the cocoa traffic for carriage by rail. It is, moreover, impossible to estimate now with accuracy what the post-war losses of revenue on passengers and other goods traffic will amount to.

11. We do not consider that the Railway should attempt to operate road services, and should prefer to see these left to private enterprise. Nor do traffic demands justify in our view any further Railway construction. We think, therefore, that in present circumstances the answer to the road-rail issue, paragraph (a) of our terms of reference, can be simply expressed as the removal of all the prohibitions at present in force except that applying to cocoa, which should also be abolished as soon as the cocoa traffic is definitely assured to the Railway by its own marketing system or by any other means.

ROAD TRANSPORT

12. The Gold Coast is well equipped with road communications, in comparison with other African territories, and the African has not been slow to develop the owner-driver single lorry transport business as an attractive and remunerative occupation. But the standard of transport provided at present is generally deplorable. The number of passengers carried is governed in practice not by the licensed carrying capacity of the vehicle or by safety regulations but merely by the physical limits of the space into which the passengers, together with the planks on which they sit and the goods and livestock which accompany them, can be squeezed. Passenger transport cannot be separated from goods transport;
the reason why most people want to travel is to accompany their goods and so personally supervise their disposal. There is a very large unsatisfied demand for road transport, both on the main routes and from village to village. As soon as vehicles are available, there will be few villages of any size in the country without at least one African lorry-owner available for hire. This is essentially the small man's industry and any system of licensing the road services that he may operate would involve at once the consideration of several thousands of individual cases and routes and the task, impossible at present, of enforcing the conditions of the licences. An even greater practical objection to attempting to place the whole country under a system of road service licensing is the pronounced seasonal factor whereby the lorries transporting cocoa during the six months' main crop buying season are not needed for that purpose for the remaining half of the year. An illustration of the difficulty of matching licensed road services to the economic needs of a route under local conditions is provided by the case where during the main fishing season a large catch is landed at a small place ordinarily requiring practically no transport. Such an event produces a cry of 'send lorries', and unless the lorries are immediately available (not being delayed by the need for some special permit) the fish are not fit to transport.

13. We consider that the practical difficulties involved in applying any general route licensing system in the Gold Coast would be so great as to outweigh considerably any real advantage that such control would confer.

14. These difficulties do not however apply to the main long-distance routes on which services for the carriage of goods and passengers are regularly operated and on which road services are essential (because the only) means of transport. The standards of efficiency and public safety at present observed on these routes are very low, and they are not likely to be improved so long as the operators who try to improve them (in respect of maintenance and reliability of the vehicles, suitability of accommodation, time-tables, fares and freight rates) are subject to unlimited competition from private vehicles, generally bought on hire-purchase and run to death in a short time. Such competition ultimately generally tends to raise transport costs. The benefits of control of road transport services on a main route have been amply proved by experience. They have not yet been seen in the Gold Coast, because the system has not been tried. It would in our view be a very desirable experiment to make, with a view to demonstrating the benefits and to producing results on which would depend the decision as to how far it should be applied progressively to other routes. The purpose of controlling the selected experimental routes would not be to create any sort of exclusive licence or monopoly. Any person prepared to fulfil the conditions laid down by the licensing authority would be eligible for a licence: the time when the traffic offering is less than the capacity of the licensed services is a long way ahead.
15. We suggest that two routes should be taken for this purpose – Accra-Sekondi and Kumasi-Tamale. Both are important main routes carrying considerable traffic, especially in the carriage of passengers-cum-goods, they do not compete with the Railway (apart from the small stretch between Acera-Nsawam), and there can, therefore, be no ground for suggesting that licensing is being introduced as a medium to drive traffic to the railway.

THE LICENSING AUTHORITY

16. We accordingly recommend that legislation should be introduced to set up a licensing authority for these two routes. The authority should be a Board with membership on the following lines:

Chairman: The Attorney-General or his deputy;
Members: The General Manager of the Railway or his representative;
The Commissioner of Police or his representative;
The Chief Transport Officer or his representative;
Up to three unofficial members appointed by the Governor.

17. The Ordinance should provide that no person shall operate a road service (i.e. a service operated for the carriage of passengers or goods for hire in any motor vehicle: to include the carriage by the owner of the vehicle of goods owned by him in the ordinary course of trade: but not to include a service by the Government) without or except in accordance with a licence issued by the Board. Licences should be annual and free and should be in scheduled form, i.e., to state as conditions –

(i) number, class, and registration number of vehicles;
(ii) freight and seating capacity;
(iii) routes and frequencies;
(iv) classes of goods;
(v) passenger fares and freight rates;
(vi) minimum rate of remuneration of drivers and conductors.

18. The Board should be empowered to refuse to grant or renew a licence on any one or more of the following grounds:

(a) that the route or routes specified in the application are in the opinion of the Board adequately served by other transport services;
(b) that the vehicles are unsuitable or unroadworthy;
(c) that the fares or rates to be charged are excessive;
(d) that the service for which a licence is sought has not been operated with efficiency and with due regard to the interests of the public;
(e) that there has been a breach of any of the conditions of the licence or of any law relating to motor traffic.
These grounds follow the Palestine provisions. An appeal against refusal should lie to the Governor in Council.

19. The Board should be empowered to cancel a licence at any time on being satisfied that there has been a breach of the conditions of the licence or of any law relating to motor traffic. An appeal against cancellation should, as in the case of refusal to grant or renew a licence, lie to the Governor in Council.

20. One difficulty with which the Board will be faced arises from the use of sections only of the route by vehicles joining it from other routes. We have considered whether the Board should be empowered to exempt from licensing operators who wish to use either a specified section or sections or a section not exceeding a mileage to be determined by the Board, but have reached the conclusion that only by complete control of the route could the purpose of licensing be achieved and that all road services plying on the route, for however short a section, should be required to be licensed.

PUBLIC SAFETY

21. It is important to be clear that the licensing of vehicles and drivers under the Motor Traffic Ordinance, the requirements of which derive from safety considerations, is a quite distinct matter from the licensing of persons to operate road transport services by a licensing authority which would have regard primarily to economic and transport considerations. The safety provisions affecting the licensing, registration, and use of commercial vehicles require both to be tightened up and more strictly enforced. We invite attention to the Report of the 1936 Committee on Road Safety in this connection. The width of road surfaces is certainly too narrow, in many cases, for the traffic now operating, and some routes clearly require vehicles heavier than the present limit of 110 cwt. for economic transport.

MUNICIPAL BUS SERVICES

22. Town Councils in the four towns in which they have been established (Accra, Kumasi, Cape Coast and Sekondi) have been empowered by Ordinance to ‘appropriate particular routes, roads and streets to the use of public vehicles employed in the transport services undertaken and conducted by the Council, to the exclusion of the use of such routes, roads and streets by other public vehicles plying for passenger hire; provided always that no such appropriation shall substantially affect to its detriment traffic proceeding to or from towns or villages outside the limits of the town’. Councils are availing themselves of these powers and should be encouraged and helped to operate their own passenger services, but the standard of service provided under this protection will require
watching, to avoid particularly any use of the services mainly as a source of revenue in aid of the rates.

ROAD COSTS AND ROAD TAXATION

23. It may be of interest (if not of practical value) to set out the position regarding expenditure on roads and the revenue derived directly from road transport for the years 1936–44. The expenditure figures, which are the amounts expended under Road Votes plus 20 per cent for overheads and exclude any provisions on account of capital cost before 1936, are:—

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</thead>
<tbody>
<tr>
<td>£</td>
<td>£305,000</td>
<td>£353,000</td>
<td>£334,000</td>
<td>£274,000</td>
<td>£241,000</td>
<td>£234,000</td>
<td>£240,000</td>
<td>£252,000</td>
</tr>
</tbody>
</table>

The revenue figures are:—

<table>
<thead>
<tr>
<th>Year</th>
<th>Motor Licences</th>
<th>Drivers’ Licences</th>
<th>Import duties on petrol and oil</th>
<th>Ferry tolls and rents (less payments to N.A.A. and B.T.F.)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1936–37</td>
<td>£65,842</td>
<td>£2,610</td>
<td>£285,626</td>
<td>£6,507</td>
<td>£360,585</td>
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<tr>
<td>1937–38</td>
<td>75,028</td>
<td>2,593</td>
<td>379,304</td>
<td>5,796</td>
<td>462,721</td>
</tr>
<tr>
<td>1938–39</td>
<td>77,793</td>
<td>3,045</td>
<td>329,683</td>
<td>10,168</td>
<td>420,689</td>
</tr>
<tr>
<td>1939–40</td>
<td>69,513</td>
<td>3,060</td>
<td>347,752</td>
<td>7,374</td>
<td>427,699</td>
</tr>
<tr>
<td>1940–41</td>
<td>74,930</td>
<td>2,581</td>
<td>220,767</td>
<td>4,505</td>
<td>302,783</td>
</tr>
<tr>
<td>1941–42</td>
<td>75,841</td>
<td>2,617</td>
<td>232,184</td>
<td>9,475</td>
<td>320,117</td>
</tr>
<tr>
<td>1942–43</td>
<td>73,527</td>
<td>2,650</td>
<td>288,640</td>
<td>6,207</td>
<td>371,024</td>
</tr>
<tr>
<td>1943–44</td>
<td>73,723</td>
<td>2,731</td>
<td>232,194</td>
<td>10,256</td>
<td>318,904</td>
</tr>
</tbody>
</table>

So expressed, revenue exceeded expenditure over the eight years by some £750,000, but the annual capital charge (which the 1932 Committee put at £125,000) would, if included, produce a deficit. We have not thought it necessary to pursue this matter of road costing, but give the figures as they stand for general information.

H. L. G. GURNEY

Colonial Secretary (Chairman).

[...]


(EAST AFRICAN TRANSPORT POLICY BOARD)  
Report on Co-ordination of Transport in Kenya, Uganda and the Tanganyika Territory  
BY  
1937  
[...]

*Note.*

100 Cents = 1 Shilling.  
The metric system is used in Tanganyika; English measures in Kenya and Uganda.  
All distances and weights have been reduced to miles and tons of 2,240 lb. /

***

**Terms of Reference.**

1. To advise the Governments of Kenya Colony, the Tanganyika Territory and the Uganda Protectorate upon the problems of co-ordinating and regulating railway, road, aerial and water-borne transport with a view to obtaining the maximum degree of co-ordination and co-operation between these transport services and in such a manner as –
   
   (a) to be fair to all interests concerned;
   
   (b) to avoid inter-territorial competition;
   
   (c) to effect all possible economies in working without impairing efficiency;
   
   and
(d) to further the economic interests and progressive development of the East African Territories as a whole.

ITINERARY.

2 [...] 

GENERAL PRINCIPLES.

Examination of General Principles with Reference to Colonial Conditions.

3. The mission which has been entrusted to me differs from most advisory missions in that the principles which should underlie the recommendations have not yet been determined with certitude. Sir Josiah Stamp, speaking on the road-rail question, recently remarked, ‘The problem of finding a new equilibrium with all the variables involved is almost insoluble’. On the other hand, the conditions of a colonial transport system are extremely simple compared with those in a fully developed country, and for that reason offer a promising field for the examination of transport principles. This more particularly applies to the railway rate structure, which, under colonial conditions, is far more closely related to theoretical principles than in the case of fully developed countries, where innumerable qualifications dictated by special local circumstances have been superimposed in the course of the past century and confuse the present issue. It may be expected therefore that colonial conditions will be more likely to suggest definite conclusions on the question of co-ordinating transport. A disadvantage of this comparative simplicity might be that such conclusions would not rest on a sufficiently wide basis to ensure that they are supported by principles of general application. While therefore a study of road-rail problems in colonies may point the way to principles which are obscured by the complications in more developed countries, the validity of such principles needs to be checked by examining them in the light of the more complicated conditions. In order to facilitate constructive criticism, and in the hope that this report will be / helpful in dealing with the problem in other countries, I have gone somewhat fully into the principles on which my recommendations are founded.

Objective of Transport Co-ordination.

4. Many concise expressions have been used to define the objective of co-ordination of road and rail transport. A typical case is that of the Royal Commission on Transport suggesting that co-ordination means a ‘state of affairs ... whereby every passenger who travelled and every ounce of goods was consigned by the
economical route and form of transport. In this statement a great deal depends on the meaning of the word ‘economical’, and whether it refers to the provider of transport, the user, or the public interest. If to the user, doubtless the word includes the qualification ‘having regard to the value of the service’. In further paragraphs there is reference to the public and national interest and to the greatest benefit of the community as a whole.

5. The report of the Committee of Independent Experts of the International Chamber of Commerce, issued in 1933, states that the principal aims should be ‘to co-ordinate all means of transport in such a way as to secure for each of them the traffic for which it is best suited, and to avoid overlapping, the financial consequences of which the community would ultimately have to bear’. The Committee further adds that ‘the function of the State is not to maintain the status quo or to favour one means of transport at the expense of the other, but to create the requisite conditions for securing the maximum efficiency of all means of transport and to further their evolution in the interests of the general welfare of the community and of technical progress’. Here, again, we have the idea that the primary consideration is the public interest, to which the individual interests of the provider of transport and of the user must be subordinated.

6. The public interest is tremendously concerned with assuring the most efficient transport system, not only for official purposes – administration and defence – but for economic development and the amenities. But it is also concerned with the protection of the individual from injury and exploitation and, at least in Anglo-Saxon countries, with seeing that in principle the cost of transport is borne by the users and not by the general taxpayer. As regards the latter principle, while approaching the problem with a strong bias in favour of its maintenance, it is expedient not to restrict the field of inquiry by ruling out any of the possible solutions from the start.

Two Categories of State Control of Transport.

7. The furtherance of the public interest has led to State control of transport in the past, involving restraints not only on transport undertakings but on the users and the public. It is now generally agreed that some form of State control of the new means of transport – road and air – is equally essential. In considering the references in this report to the control of transport, it is necessary to keep in mind the differences between two categories of regulation. The first relates to matters such as the safety and convenience of the public, as exemplified in the case of road transport by regulations governing the dimensions, weight, upkeep, speed and loading of vehicles, insurance against third party risks, conditions of labour and qualifications of drivers. This type of regulation applies equally to
private and commercial transport, though the rules are frequently tightened up in the case of public transport for payment. The second category relates to the regulation of the exercise of transport, for example by licensing with or without specific obligations. It is this second category of regulation which is the most important in transport co-ordination.

General Grounds for State Control.

8. From these preliminary considerations it may safely be stated that measures are not justified solely to protect any particular means of transport which has outlived or failed to justify its usefulness. On the other hand, where a means of transport is essential in the public interest, it should if possible be capable of being operated on a commercial basis. By a commercial basis is meant the earning of a sufficient return to attract, or in the case of a State transport organization to meet the charges on, fresh capital constantly necessary for healthy development. Evidently, if it cannot be operated on a commercial basis by itself, then the cost must be borne either by the users of other forms of transport or by the general taxpayer.

9. Apart from the structure of the railway tariffs, which will be referred to later, an important result of Government control of railways and ports has been the generalization of normal tariffs and of the obligation to accept traffic, the publication of all tariffs, and the principle of non-discrimination. These features place transport in the category of a public service, in the sense that the public have certain rights and the transport undertakings certain obligations. Such a system implies an averaging out of the normal charges for transport irrespective of the actual cost of particular consignments or journeys, and ensures the certainty of a conveyance or journey being effected under known conditions – an advantage which is not perhaps generally appreciated after a hundred years of enjoyment. It would be difficult to justify any system of transport co-ordination which went back on these advantages to the user. A little reflection will show that transport undertakings cannot fulfil these ‘public service’ obligations unless they are afforded some protection from unregulated competition.

10. On the other hand, it would also be a retrograde step to force passengers or goods to travel by a route or form of transport which is arbitrarily decided for them in each case. Whatever scheme of co-ordination is adopted should aim at establishing a condition under which the user in the exercise of his own free choice will tend to utilize the most economic service from the point of view of the community.

Are East African Railways Obsolete?

11. Before proceeding further it will be as well to dispose of the important question: Is road transport likely to supplant railways? The answer should not depend on the ownership of the means of transport. To examine this question in a country most of whose traffic consists of imports and exports with a long
average haul (average haul Kenya and Uganda Railways 388 miles, Tanganyika Railways 222 miles, as compared with Great Britain 57 miles), the first element is the relative cost of transport by rail and road, assuming for the railways a volume of suitable traffic in the future commensurate with probable developments, and for road transport an improvement in roads such as might be expected to be effected in view of the increasing revenue from motor taxation. The comparative figures should include not only working expenses and overheads, but renewals and interest, or a reasonable dividend, on the capital employed, and, in the case of road transport taxation for road purposes.

12. It is well known to be impossible to calculate an accurate figure for the average cost per ton-mile of operating railway goods traffic, but on the East African railways, in view of the very large proportion of revenue derived from goods traffic, an approximate figure has been worked out which is sufficiently near the mark for the purposes of this report. This figure for 1935 works out at 16.568 cents per ton-mile of public traffic for the Tanganyika Railways. The reason for the Tanganyika figure being so much the higher is solely due to the smaller amount of traffic which has to carry the fixed charges – 235,776 tons compared with 863,096. In the course of time Tanganyika traffic may be expected to increase and thus reduce the total cost per ton-mile. Even as it is, however, it will be seen later that Tanganyika costs are less than 60 per cent of the minimum average cost likely to be reached for main road lorry transport under favourable conditions in East Africa. It is not necessary therefore to explore the case for the maintenance of the railways on grounds other than cheaper cost of working.

13. While, however, it is quite clear that East Africa cannot dispense with its railways, the question is bound to arise as to whether this applies to all the railways or whether certain lines could usefully be replaced by road transport. In general this cannot be determined until a stable scheme of coordination has been arrived at. In East Africa the situation is comparatively simple. While it would be a difficult task for anyone to lay down the lines of a combined transport system in a country like England, starting de novo, the more so on account of the reaction between the possibilities of transport and the location of industries, it is clear that if one were to start afresh in East Africa the general lines of communications would develop very much as at present. There would probably have been fewer short branch lines of railways and in places an improved alignment. With State-owned railways and roads the debt charges on account of expenditure representing assets which are obsolete or which, in the light of subsequent events, might have been provided cheaper or more effectively, remain directly or indirectly a charge on the State until the loans are paid off; but the proportion of railway capital assets which have become obsolete in East Africa is so small as to be capable of being dealt with, in one way or another, by the normal methods of railway accounting. The problem is simplified by the general agreement that the chief transport asset, the railways, is a live one.
Branch Lines.

14. As regards the possible redundancy of some of the existing branch lines: on the Kenya and Uganda Railways, to which this question more particularly applies, an effort has been made to ascertain how far the various branches may be considered as paying. In the formula adopted the branch line, in addition to earnings on the branch, is credited, firstly, with the whole of the main line revenue on traffic arising or terminating on branch lines, less haulage costs and depreciation and loan costs on engines and rolling stock, and, secondly, with the port revenue less actual out-of-pocket costs. This formula is unduly favourable to branch lines to the extent to which this traffic would have been carried to the main line by road if the branch lines had not existed.

15. Most of the branch lines do, in effect, bring to the main line at low rates important tonnages of exports which could not stand road transport rates. The question remains whether the cost of rail transport over a branch line is less than the corresponding road cost. The total tonnage would have to be very low and the branch line overheads in consequence very high for road transport costs to be less than the branch line cost of conveying such traffic to the main line, the more so as the branch line loan charges will have to be met in any case and, if the traffic were diverted to road, fresh loan charges for road improvements might have to be created. The majority of the branch lines referred to above are therefore likely to prove the cheapest form of transport, and even if they result in a loss to the railway any Government subsidy to the railway to compensate for such loss would be less than the corresponding subsidy to road transport. In such cases the branch line should be protected as far as possible against the loss of high-rated traffic.

16. There are, however, cases where the tonnages conveyed by branch lines are small and consist mostly of commodities which could stand the road charges to the main line. Unless such branch lines are likely to be part of a future main line of railway serving extensive areas which may be expected to yield a paying tonnage for the railway, it is worth examining the situation afresh in the light of this report, and of the improvements to roads in the last few years, to see whether by dismantling the branch line the real cost to the Government, including the railway, would not be less than at present, even if some transitional assistance had to be given by the Government to users in specially hard cases. Any proposals to construct additional branch lines should be carefully scrutinized in the light of the above considerations.

17. It will be convenient from this point to deal more especially with the main problem of road and rail co-ordination, returning later to air and water.
Road Transport.

Advantages of Road Transport.

18. It is unnecessary to dilate on the great benefits which have been conferred by the advent of motor transport. It will suffice to refer to its special qualities of flexibility and individuality. The public transporter, owning often only one or two vehicles, without any overhead organization or necessity for uniformity in practice, can adapt himself to the individual requirements of his client, and the private car-owner and ancillary user have attained a degree of independence which has clearly increased the amenities and enlarged the scope of individual business organization.

Control of Private Road Transport.

19. Any control of the private passenger car, other than in matters relating to the first category referred to above, is politically inconceivable in East Africa as elsewhere. On the other hand, it is not difficult in East Africa to differentiate between the circumstances in which the ancillary user should be unrestricted and those in which he might properly come under such restrictions as may be applied to other forms of goods transport.

Road and Rail in East Africa.

The Main Problem.

20. Road competition for passenger traffic is of a comparatively little importance, in view of the small proportion of passenger traffic on the East African railways. The problem has therefore been approached as primarily affecting goods traffic. The reason why in East Africa motor transport, which is an unmixed blessing when away from the railway, introduces a complicated problem when it competes with the railway, may be briefly recapitulated as follows:

A large percentage (over 85 per cent on the Kenya and Uganda Railways) of the goods revenue arises from exports and imports. The imports cannot take place unless purchasing power is created by the exports. The exports cannot compete in world markets unless they are carried by the railways at rates which in some cases barely cover out-of-pocket cost of working. Thus the railways cannot afford to do except on account of the high rates received from imports. With a monopoly this system of rating is inevitable and advantageous to all parties. The railways benefit by maintaining the maximum net revenue, the traders by developing the maximum of trade, and the Government by the increased general revenue through greater prosperity, and, sooner or later in colonies, by not having to subsidize the railways. The import and export regime of East Africa,
like the industrial regime of the more / developed countries, has been built up in the above conditions. Sir Josiah Stamp, recently referring to the effect of road transport on the railway rating system, observed that ‘what was being attacked was the historic structure of industry’. Before the arrival of the motor, from the railway point of view neither class of traffic ‘subsidized’ the other. If, however, the railway monopoly ceases and there is a cheaper alternative for the higher classes of traffic, then if high-class import traffic is constrained by Government action to pass by rail in spite of higher rates, it does in fact subsidize the export traffic. Clearly it pays it to do so if necessary to maintain the purchasing power for imported goods, and there would be no economic hardship in maintaining substantially the present relationship between the transport charges for different commodities. This is a fundamental assumption in support of which local opinions were practically unanimous. Unless, however, this is to be effected through the operation of a railway or combined transport monopoly, the subsidy will have to be collected in some other way, possibly in a different form, requiring Government intervention.

21. It may be mentioned that what is usually referred to as the railway rate structure is not necessarily restricted to the railways. It could be introduced, and in fact would automatically result within limits from a road transport monopoly. Failing such monopoly, the manner in which any subsidy of exports by imports is collected does not in principle depend on the form of transport.

Cost of Running Motor Transport.

22. A great deal has been written in the last few years on the cost of motor transport in colonial countries, with differences in conclusions which are most bewildering until the reasons are found in local conditions and in the various interpretations of what is meant by the cost of working. In the first place, it is necessary to be clear whether the cost of working or the charges for transport are referred to. Frequently cut prices are quoted below the cost of working; sometimes road transport at seasonal peaks can command a price leaving a substantial profit which helps to tide over the slack period. Moreover, in East Africa, the difference in road conditions, ownership of vehicles, fuel used, annual mileage, overheads, and above all load factor, afford wide scope for differences in the cost of working per ton-mile.

23. From information given to me in the course of extensive inquiries in the three territories, I am left with the impression that a road and rail co-ordination plan must start with the assumption that, with a load factor which appears to average about 60 per cent, for regular transport work on main roads, such as they are and are likely to be for many years to come in East Africa, an economic charge giving a fair profit might be as low as 35 and 40 cents per ton-mile for a petrol
lorry and possibly 30 to 35 cents for a diesel lorry, assuming the latter will be taxed
to bring in approximately the same contribution as the equivalent petrol lorry. It
is claimed that still further economies will be possible with the diesel lorry. The
ancillary petrol lorry doing a comparatively small annual mileage on indifferent
roads is not likely to average less than 45 to 50 cents per ton-mile. The traders’
lorry is a class by itself, as it can afford to accept lower rates to obtain a full load,
while the free lance, often working under conditions which would not survive
police inspection, will freely accept quite uneconomic rates for an inferior service.

24. Very few transport operators appear to keep proper accounts of the cost
of working of their vehicles, transport accounts being frequently merged into
the trading accounts of stores, with the result that it is practically impossible to
obtain any reliable figures of the profitability or otherwise of most of the trans-
port carried on in the country. In the absence of any organization representing
motor users, the motor trade or perhaps more appropriately a motor journal
in East Africa would be performing a valuable service in the education of local
transporters if they published from time to time details of the average cost of
operating different classes of vehicles in varying conditions, on the lines of the
‘Tables of Operating Costs’ issued by the Commercial Motor, but adapted to
local circumstances.

Effect of Unrestricted Competition.

25. It is evident from the above figures that if motor transport were under the
same obligation to carry traffic tendered as the railway at the same rates as the
railway for all commodities, viz. an average of 12.68 cents (Kenya and Uganda
Railways) to 18.29 cents (Tanganyika Railways) per ton-mile, it would have to
go out of business and leave the railways alone in the field. If, however, road
transport were allowed to pick and choose and limit itself to the highest classes
of traffic in one direction and the best return load available in / the other, it
could easily undercut the high railway import rates and earn a profit. The rail-
ways would then lose the revenue necessary to balance the low export rates, and,
as any attempt to raise the latter rates beyond the amount determined by world
competitive prices would result in the cessation of exports and hence of imports,
a heavy railway deficit would occur which would have to be made good by the
Government at the expense of the taxpayer, including the importer, who would
in this way lose any temporary advantage obtained by the reduction of rates
for the carriage of imports by road. The only beneficiary would be the motor
transporter, until he was also ruined by cut-throat competition for the dimin-
ishing traffic. It appears to be generally agreed that such a development would
be against the interests of the community, whether as owners of the railways or
as taxpayers, and the user, and my task is thereby greatly facilitated. In short,
uncontrolled and unrestricted competition between rail and road is ruled out as a solution, and some form of regulation of the exercise of transport must be regarded as essential for any transport co-ordination.

Present Road and Rail Regime.

Protection of Railway Monopoly.

26. The present system for safeguarding the higher-rated railway traffic from road competition consists of the prohibition of goods transport other than the local produce of agriculture or stock farming, between specified points on scheduled roads considered to be competitive with the railway. This amounts in principle to restoring the railway monopoly. It is a solution which, consciously or unconsciously, has been tried, at least partially, in many countries and which as might be expected is proving itself quite impracticable, except as a step to other solutions, in more developed countries with a network of railways and roads and traffic movements far more complicated than the predominantly long-haul export and import flow in East Africa. It is, however, fairly effective and simple in the present local conditions, though it will be seen later that the existence of roads slantwise to the railway and of circuitous routes is already introducing in a simplified form some of those complications which, in a much aggravated form, render the system impossible in more developed countries. The system is recognized as lacking in flexibility, and one of the chief objects of my inquiry is to suggest improved means of attaining the same object.

Division of Function. Which is the Economic Route?

27. As already stated, the objective of any system of transport co-ordination is to attain a correct division of function – in this case between road and rail. Here again the comparatively simple conditions in East Africa make it worth while examining the theoretical basis for such division of function, into which the ownership of the means of transport does not enter. It will be, for example, particularly useful, in the case of points some distance from the railway, to have some guide for assessing, on the basis of cost to the community, whether a rail and road route is better than an all road route.

28. Seeing that the fixed working costs of roads and railways, including renewal of fixed assets and loan charges, have to be met in any case, the fundamental basis of comparison between road and rail costs, for the purpose of determining which route is in the economic interest of the community, is that element of the cost which varies with the amount of the traffic. For the railway it is near enough to take this cost at 3 cents per ton-mile at an average for the items referred to
by Sir Felix Pole\(^1\) in his report on Northern Ireland (see Appendix 1), though it must be remembered that the cost of operation of different kinds of traffic under different conditions varies between very wide figures.

29. If comparative figures of out-of-pocket costs for motor transport are worked out, also on the items selected by Sir Felix Pole, it will be noticed that these out-of-pocket costs are a far higher proportion of the total costs than in the case of the railways, the only fixed items being rent and rates, management, insurance and interest. A fairly low estimate of the out-of-pocket cost of working 2-ton diesel and petrol lorries in practice with efficient operation would appear to be in the region of 23 cents per ton-mile for a fully taxed diesel and 28 cents for the petrol lorry, assuming an annual mileage of about 25,000 and a load factor of 60 per cent. Of this, some 4 to 5 cents per ton-mile at most might represent the registration, fuel and other taxes paid towards the upkeep of the roads – which have got to be maintained whether they are used or not. On this basis, the out-of-pocket cost from a community standpoint would not be less than 18 cents per ton-mile compared with 3 cents for the railway. These figures, adapted as necessary to the local conditions of the each particular case, give some idea of the relative cost to an all-pervading transport monopoly of alternative routes. The theoretical analysis in Appendix 2 sufficiently indicates that in so far as cost is concerned most of the traffic by slantwise roads or circuitous routes likely to come into question should pass by rail. The practical conclusion in each case would of course be influenced by local circumstances. The relative value of the service rendered remains to be considered. It will be noted that the correct division of function between road and rail has nothing to do with the rate structure.

**The Combined Monopoly Solution.**

30. A system which would lend itself to the automatic division of traffic on this basis would be a combined monopoly of rail and road transport. This means, for example, that the monopoly should pay for the cost of maintenance of the roads (less contributions from non-transport users) irrespective of the extent to which it uses the roads. In this case the transport undertaking would automatically use whichever form of transport yielded the greatest contribution towards the combined general expenses and capital charges of roads and railways. Where one or other form of transport offered a better service and the choice lay with the user, the rates for conveyance by each of the forms of transport would tend to be fixed so that it paid the transport organization equally well whichever means was used. The traffic would thus be free to choose the most economic route in accordance with the principle that a more expensive service is justified only if the increased value of the service is at least equal to the increased cost. Even if it is found that there are practical reasons against the adoption of
such a policy in its entirety, it is a useful check in dealing with the question of transport co-ordination to ask oneself what would be likely to happen under conditions of a combined monopoly. The chief difficulty of this system arises from the treatment of the ancillary road user, who would have to come under the monopoly, and the chief disadvantage from the possible loss of incentive to continuous improvement in efficiency. The chief advantage would be the automatic maintenance of the present rate structure. It may be stated at once that conditions in East Africa are quite unsuited for this solution. Nor are they any more suited for the analogous solution of a common financial interest between separate road and rail monopolies through a pool, as exemplified in the case of Northern Ireland. It is quite inconceivable to envisage even a compulsory amalgamation of road goods transport undertakings, and any attempt to effect this in East African conditions, except in isolated cases, would lead to chaos in the road and transport industry.

The Toll Solution.

31. It has been noted that a combined monopoly of road and rail transport, or separate rail and road monopolies with pooled financial interest, would if practicable have led automatically to an economic division of traffic between road and rail, with maintenance of the present rate structure. It has also been demonstrated that a simple rail monopoly can substantially be restored in the present conditions in East Africa by the suppression of competitive road transport.

32. The object of the reconstituted rail monopoly, viz. the protection of railway revenue through the maintenance of the present rate structure, could, however, in theory equally well be met if all traffic passing by road in competition with the railways were to pay as toll to the railways the amount which the railways would lose by not carrying the traffic, i.e. the difference between the railway rate and the out-of-pocket cost of working. From the community standpoint this toll should be reduced by the contribution to standing road charges which would be made if the traffic passed by road. This toll would have to be payable whether traffic was carried by a public transport undertaking or by an ancillary user. The conception of toll as the difference between the charges of a transport undertaking and the variable cost of working has been elaborated in his classic work by Colson. If in spite of the toll it paid to send traffic by road, this would prove that the increased value of the road service was worth the increased cost to the community.

33. The levying of a toll was suggested by General Hammond in 1930, and legislation was drafted in Tanganyika in 1931 to give effect to this recommendation. The Bill was, however, withdrawn, I am informed, ‘because of the practical difficulty of closing a road to through traffic at any point or points owing to tracks,
secondary roads and private roads impinging on the restricted roads throughout
the whole length, and the difficulty of differentiating between through and local
traffic; and, further, the difficulty and expense of maintaining checks on the issue
and collection of receipts and tickets issued for tolls, particularly under the Gov-
ernment system of control of public moneys. In the circumstances, the collection
of the theoretical toll, the calculation of which would involve a detailed knowledge
of the present railway classification and the quantity, starting point and destination
of all competitive traffic carried by road, would obviously be out of the question.

34. Nevertheless, the Tanganyika Licensing Act of 1931 and the correspond-
ing Act for Kenya attempted to carry out the principle of the toll by allowing
vehicles to compete with the railway on payment of what was virtually a com-
pounded toll in the form of a high licensing fee, amounting, for instance, to
£330 for a 2-ton lorry for a distance of 284 miles. It can easily be calculated that,
by carrying the highest classes of goods, a lorry could afford to pay these rates
while making a handsome profit, and in fact the Acts were replaced by the pre-
sent Prohibition Acts when it was realized that they simply led to loss of revenue
without effecting any rational division of traffic.

35. It is interesting to note other cases in which the toll principle has been
virtually introduced, notably in Australia. In Queensland heavy goods and
passenger vehicles on routes competitive with the railway are supertaxed to an
extent varying with their capacity. In New South Wales, for journeys over 20
miles, the maximum tax was 3d. per gross ton-mile, the weight of the vehicle
being calculated at tare plus full load capacity. This tax, with a load factor of
60 per cent, might amount to anything up to 10d. per ton-mile carried. It is
not surprising that as a first result most of the operators had to leave the road.
Since then the free distance has been increased to 50 miles, and the Act is being
administered with greater flexibility. No fees are levied on certain kinds of local
produce and reduced fees are charged in cases where rail transport is impracti-
cable or unduly inconvenient. Though more flexible than was the East African
licensing system, these levies do not altogether correspond with the theoretical
toll as defined above. In France the proposed taxes on competitive road trans-
port would appear in principle to correspond more closely with the theoretical
toll. Proposals for toll on the above lines must not be confused with the levying
of tolls on important public works in order that the actual users may bear their
full share of the cost. Nor must the principles of the traffic toll be confused with
the practical difficulties of collecting the same without intolerable hindrances to
movement. These hindrances and the other difficulties referred to rule out the
orthodox toll system as the general solution of road and rail co-ordination, but I
shall have to occasion to refer to it again.
Basis of Solution for East Africa.

36. Thus for East Africa, under present conditions, we are driven back to the protection of the railways monopoly as the basis of a policy for co-ordinating road and rail; and it remains to be seen how far it is possible to borrow elements from the other theoretically sound solutions in order to import flexibility and to permit of adaptation to changing conditions.

Rate Revision.

37. Whatever system of co-ordination is adopted, it is essential to reduce the great disparity between the rates for the higher class goods and a fair commercial rate for the transport of goods by motor. At present first, second and third class rates start at 145.60, 104.16 and 70.56 cents per ton-mile; at 300 miles the rates are still 127.31, 92.99 and 63.84 cents per ton-mile, and even at 700 miles the operation of the taper only reduces the rate to 98.56, 76.16 and 53.76 cents per ton-mile.

38. Apart from the incitement to transport smuggling along prohibited roads parallel with the railway, checked to some extent at present by the bad state of these roads, this disparity results in motor transport conveying high-class goods by long and devious ways, e.g. 140 miles along the coast by dhow from Mombasa to Lamu, and thence 583 miles by inferior roads to Nairobi via Meru and Nyeri, as compared with 330 miles by rail from Mombasa to Nairobi. The first class rate to Nairobi is 408.58 and second class 300.16, whereas at an average of 40 cents the circuitous route of 723 miles would only cost 289.20. The dhow portion averages less than 10 cents per ton-mile.

39. Moreover, although the out-of-pocket cost of rail transport is considerably less than by road, and it is therefore in the general interest that the railway should be used, it will easily pay users in the case of the present high-class goods to employ a longer route with a longer proportion of road mileage (e.g. Lupa area to Dar es Salaam via Dodoma) in preference to a shorter route with a smaller proportion of road mileage (e.g. Lupa area to Dar es Salaam via the new Itigi road). With inevitable development in the road system this question of slantwise road traffic will grow in importance and difficulty unless it is faced at the outset.

40. Even a complete combined road and rail monopoly, including the ancillary user, would probably have to modify its rate structure to a certain extent as a result of the new conditions, and without a complete combined monopoly such a change is inevitable if it is desired to avoid increasing the rigidity of transport control to protect the revenue of the railways on the basis of preserving the railways monopoly.
41. It is important therefore to reduce the above disparity by reducing the higher class rates to a figure more comparable with road transport charges. The loss of revenue would have to be recouped either –

(a) by raising the lower class rates, other than those export rates which are based on world prices, e.g. on such commodities as building materials, machinery, tools, iron and steel; or

(b) by a subsidy out of general revenue, the funds for which might be provided by an increase in Customs duties by primage on the principal imports benefiting from the reduction in railway rates.

The former method in fact implies an acceleration of the alteration of the price structure which is bound to result from the changes in transport charges brought about by the advent of the lorry. Its application could be roughly adjusted to leave unchanged as far as possible the total weight of rail transport costs at present falling on each region served by the railway, and any change of incidence would therefore be local.

42. The latter alternative in effect preserves the present monopoly rate structure and consequently the present price structure by the expedient of levying part of the toll on high class goods through the machinery of the Customs monopoly. The incidence of transport costs would be changed to the extent of placing equally on the whole of the users of high class imports, instead of only on those up-country, the cost of developing a planned export trade. The up-country districts would benefit to the extent of the primage paid by the coastal regions. It might be advanced in support of this alternative that in colonial countries the general community is more directly interested in foreign trade than is the case in more highly developed countries, and that the prosperity of the coastal areas is bound up with up-country development. Some compensating alleviation to the coastal native population might be found possible, if considered essential, through the machinery of provincial taxation, but this might be too uncertain in its incidence to be worth the extra complication.

43. Apart from the natural repugnance for what might be regarded as a special Government subsidy to the railways, I am advised that, at least in Tanganyika, difficulties would arise through the encouragement of local industries, which are not at present taxed, at the expense of Customs revenue, and that further revenue would be lost through a decreased amount of consumption in the coastal areas resulting from the higher duty, and through an increase in smuggling from Zanzibar, where the Customs rates are already much lower than in Tanganyika. Moreover, in virtue of an international agreement, through traffic with the Belgian Congo would benefit from the reduced rates without paying the primage, and this could only be partially compensated by other alterations in
rating this traffic. These difficulties do not arise to the same extent in Kenya, where, moreover, the proportion of coastal consumption of imports is much lower than in Tanganyika. No difficulties would seem to arise in Uganda.

44. This alternative has been briefly analysed, as it is theoretically sound in the conditions of East Africa. It virtually preserves the present rate structure by conforming substantially with the monopoly solution, and only in the matter of machinery borrows the subsidy solution. It is, however, not a solution applicable in more developed countries with less simply defined currents of traffic, and any attempt to apply it in such countries would lead directly to the railways being subsidized by general taxation instead of by the user of high-class goods. It might be sounder therefore, in the long view, to favour the former alternative of raising the rates on the medium and low classes of goods, to compensate for the reduction of high-class rates.

45. It is not easy to suggest what should be the level to which it is desirable that the highest railway rates should be reduced. To avoid undue disturbance to trade and losses on stocks in hand, any reduction in rates should be gradual, and if the corresponding increases are equally gradual the operation of interest charges will reduce the incitement to forestall the changes. Consequently it is perhaps not necessary to fix a final figure from the start; it can, however, be safely said that this figure should not exceed 50 cents per ton-mile if a reasonably flexible scheme of road and rail co-ordination is to be attained (see Appendix 2).

46. The practical results would be that the first, second and third class goods rates would ultimately be merged into a flat rate of 50 cents per ton-mile for all distances up to about 710 miles, after which the third class rate would bifurcate so as not to exceed the existing charges. The effect of solution (a) on certain f.o.r. prices at Nairobi, Kampala, Dodoma and Mwanza, assuming that the increases and reductions of rates balance, has been very tentatively worked out. The reductions in prices of the higher class goods would range from about / 1 ½ per cent to 8 per cent. Unfortunately, here again, Tanganyika, owing to its relatively lower proportion of low-grade imports, cannot effect a balance without disproportionate disturbance in the price levels of some of these imports, including commodities which have been assisted in the past by cheap rates to encourage production. The Kenya and Uganda Railways, on the other hand, could easily introduce the whole change on this basis, with maximum f.o.r. price increases at Nairobi and Kampala of under 6 per cent.

47. In the event of railway finances permitting a reduction in rates, such reductions could appropriately take the form of foregoing part of the increases in the lower rates otherwise necessary. Here again the Kenya and Uganda Railways, with a substantial reserve fund, are favoured by the probability of a consider-
able surplus after meeting renewals and interest charges; in fact, the Kenya and Uganda Railways claim that they could effect the whole of the proposed reductions in high class rates to a maximum of 50 cents per ton-mile within five years from prospective surpluses, assuming the present boom conditions continue for so long – which is perhaps risky. On the other hand, the Tanganyika Railways in 1936 are likely at best to cover interest charges but no depreciation of British assets (£112,000 per annum), and they have at present an accumulated deficit of £440,000 besides arrears of renewals of British assets of over £800,000, so that any railway contribution towards the desired change could only be at the expense of increasing the real deficit.

48. The problem is complicated by the necessity for maintaining within a narrow margin the same rates of Customs duties for all the territories. Moreover, it is desirable as far as possible to avoid increasing by further rate disparities the difficulties already arising at points of contact of the Kenya and Uganda Railways and Tanganyika Railways systems. A similar scheme would therefore have to be adopted for both railways to the extent of the maximum which can be effected by the Tanganyika Government and Railways, possibly by a combination of methods (a) and (b). If on investigation this proves to be less than the extent of the change I have suggested, the Kenya and Uganda Railways would be well advised to utilize their expected surplus to complete the programme.

49. It is interesting to note that Mr. Gibb suggested partial compensation for reductions in railway rates to meet road competition by increasing the harbour charges on those descriptions of traffic which benefit from rate reductions. Tanganyika, with its considerably lower port charges for the higher class imports, might usefully adopt this suggestion to assist, if even only to a small extent, in carrying out the suggested changes.

50. It is recognized that what is suggested is a major change in rating policy. Experience has shown that it is difficult to effect piecemeal increases in railway rates, and any important change should therefore be carried out as part of a general plan, bearing in mind that it is easier to make subsequent adjustments by reductions than by increases. The conditions in East Africa lend themselves to the execution of this important adjustment as a single deliberate measure, coupled with any steps considered necessary to ensure that the benefits of rate reductions are passed on to the users. The alternative is the gradual attrition of the higher rates, as in so many other countries, without compensating revenue, since it will be impossible and undesirable, with improving roads and a more elaborate network of communications, to maintain the rigidity of control necessary to protect the railway revenue at existing rates. The present upswing in
the trade cycle is a favourable time for the change in the permanent interest of transport development in East Africa.

Co-ordination of Road and Rail Transport.

Possibility of Destructive Competition.

51. The modification of the rate structure to the extent suggested will not in itself solve the road-rail question. Even if the maximum rate was adjusted down to what is a fair commercial rate for road transport, and as this varies under different conditions such an adjustment would be impossible, there still remains the fact that it pays competitive transport undertakings, so long as they remain in business, to accept a rate which leaves the barest margin over the out-of-pocket cost of working, rather than lose the traffic; so that if free competition were allowed the railways would be obliged to follow uneconomic rate cutting with a loss of revenue to road and rail which would be against the public interest. Some action will also be required to ensure the maintenance by the railways of an efficient public service as regards generalization or normal rates, obligation to carry, publicity of rates and non-discrimination, and it has already been pointed out that the imposition of such obligations implies a corresponding degree of protection against competition from transport organizations not subjected to the same obligations.

52. Further, there remains the question of the co-ordination of road transport inter se, which affects by far the larger part of the road transport industry. The conclusions of all three recent territorial committees on transport indicate that there has been unduly destructive competition between transport concerns, resulting in financial disaster and in Uganda in a deplorable increase in road accidents through racing for clients. It is hardly necessary to mention that any attempt to regulate the situation by prescribing minimum charges is doomed to failure.

53. My own observations and inquiries bear out the statements in the Kenya Committee’s report that at present in most areas there is not a surplus of transport – a result of greater discrimination in the granting of credit for the hire purchase of vehicles engendered by previous losses, and of the increase in production due to general improvement in the economic situation. Nevertheless, the natural and universal tendency is for road transport to be increased until the situation gets out of hand and leads to renewed losses and deterioration of service unless the development of road transport is guided in the public interest and that of the transport owners themselves.

Licensing Control Recommended.

54. For all these reasons, and also to give time for the proposed rate changes to take effect, it seems necessary for East Africa to follow the established practice in practically every other country by instituting some form of control by licensing
applicable to all forms of transport in order to assist an orderly development in the general interest.

55. If this conclusion is accepted, then it is better to use the present occasion, when the minimum of restriction is likely to be involved, to introduce the new arrangement, rather than to wait until there is a crisis in transport, when the institution of regulation might involve additional hardship in the initial stages.

**The Regulation of Road Transport.**

56. Seeing that the question of the control of road transport is one of the most important aspects of my mission, I have endeavoured to envisage tentatively in some detail how such control might be expected to work in present conditions in East Africa, bearing in mind the necessity for avoiding complicated formalities and for ensuring the freest possible movement of road transport consistent with the extent of regulation considered necessary.

57. The most important duty of the new control organization would have reference to the second category of regulation referred to in para. 7, that is, the regulation of the exercise of transport, for example by licensing with or without specific obligations, on the general lines of the Kenya Road and Rail Report.

**Licensing of Road Transport Competitive with Railway.**

58. With the accepted policy of protecting railway revenue from attacks on the high-rated traffic, it is evident that, while the present prohibition Ordinance would be replaced by the new arrangement, fundamentally the present regime of prohibition will be little changed, and the licensing of regular goods services parallel with the railway will only be resorted to in special cases where the advantage of road transport clearly outweighs the public claim to railway revenue. This will apply, for example, to country delivery services within a certain radius of distribution centres. A licensing system coupled with the proposed reduction on high-class rail rates will afford more flexibility than the present regime for dealing with such cases. At the same time, a possible result will be that certain competitive services at present not covered by the prohibition law will not be licensed.

59. The proposed alterations in the rate structure, involving virtually a flat rate of 50 cents for the first four classes of goods up to some 250 miles, will render it feasible in special cases, as an alternative to a railway-operated service, to permit regular traffic parallel with the railways by reliable firms, on payment of a toll, on the principles already referred to, to safeguard the railway revenue – such toll being far more easily assessed and checked than under the present system of rating, which would make it practically impossible.
60. In dealing with licences for road traffic slantwise to the railways, the Committee might start with the theoretical principle that the natural route is that which involves the least variable cost of working, and that railway revenue has a prima facie case for protection by restriction of road traffic or by tolls if traffic is deviated from a natural route as a result of the operation of the railway rate structure.

61. As regards passenger services parallel with the railway, under 8 per cent of the railways revenue arises from passenger transport. The fewness and unavoidable slowness of the present day railways trains make it inevitable that road services should be licensed to the full extent of the demand, and probably inexpedient that a toll should be levied on the lines suggested for goods traffic. The principles governing licences will therefore be similar to those for any other passenger service as described in para. 74 et seq., with the sole difference that in suitable cases the railways should be given priority for running or participating in such services, if they are prepared to do so and to fulfil the requisite conditions as to services and fares.

**Feeder Goods Services.**

62. The great majority of motor transport is employed on feeder services to the railway. Statistics are not available to show the distribution and employment of goods vehicles. One advantage of the proposed control organization will be that this information will automatically become available. From information given to me during my journeys it seems that, except in the large centres, a large percentage of vehicles is owned by people corresponding to ‘B’ licensees in Great Britain, who have other businesses than transport, and who use their vehicles firstly to supply their own requirements and secondly to fill up with paying traffic or to carry out transport work in the peak season. This applies also to most of the large transport contractors who have stores, estates, hotels, garages, or other occupations besides that of transport.

63. Most of the remaining vehicles are used by their owners for their own purposes only, e.g. ginnery owners, sisal estate owners, settlers, and Government vehicles, corresponding to the ‘C’ licensees of Great Britain. The balance consists of vehicles owned by transport contractors carrying on no other business; some (e.g. in the coastal towns) working from fixed centres, others moving about to follow the seasonal peak load in different areas. For example, after the cotton season in Uganda from January to June, a considerable number of lorries are transferred to Mwanza for the period June to November to deal with the cotton season there.

64. Certain ancillary users, such as cotton ginneries, lay up most of their lorries during the off-season, a practice which appears to be fairly widespread in
certain regions. The ‘B’ category owners and the free-lance transporters try to tide over the slack season by competing for the reduced traffic at cut rates.

65. In these circumstances the problem of the feeder services will probably best be met by carefully dividing each territory into traffic zones corresponding as closely as possible with the normal field of operation of feeder services to one or more railway stations, with separate zones for certain outlying areas. Applications for licences would then be invited from lorry owners desiring to operate in these zones – either as purely ancillary users or wholly or partly for hire. To get over the difficulty of any lorry requiring to serve an area lying over or near the boundary of two zones, any lorry should normally have the right to apply for licences for any two adjacent zones.

66. In the first place, as proposed in the Kenya Report, all applicants proving that they have been functioning in a particular zone would be given a ‘B’ or ‘C’ licence, as the case may be. In this way the control organization would learn the number of lorries normally operating in each zone throughout the year. The number of ‘C’ licences in any zone would be unlimited; the number of ‘B’ licences applied for should form a basis for determining the maximum number of lorries which would be allowed to operate in any area during normal and peak periods. Under present conditions it is unlikely in most zones that this number will be less than the present number.

67. Licences would have to be issued by the local licensing authority up to this number in order of application, subject to special rules which may be decided on as to priority for local storekeepers or producers up to their own requirements, or for previous holders of licences. If in the course of time there was evidence that the number of lorries in any zone was too great or too small, as disclosed partly by applications for and opposition to new licences, and partly by the ruling transport charges compared with other areas, the maximum number of licences would be amended accordingly and the licences adjusted by not replacing those which lapsed or by issuing additional licences, as the case may be, the objective being that there should be on the one hand ample transport at reasonable cost to satisfy all the requirements of the zone, and on the other hand that motor transport should not be allowed to get into an unhealthy condition by being forced to accept uncommercial rates through excessive competition.

68. To be effective, such system must be capable of supervision by the locally available police, most of whom are illiterate except for the reading of numbers. I would therefore suggest that each area should be allotted a distinctive coloured permit plate in one colour or in two colours separated by a vertical or diagonal line. Probably five colours would suffice for all the zones, each territory having a different size plate. Every commercial vehicle should be obliged to have on
it a bracket capable of having three such plates bolted on and effectively sealed. Each plate would have a small identification number. The licensing authority, on issuing an area licence, would issue a corresponding plate and seal the same. If the area license is no longer required it will be returned to the licensing officer, who will break the seal and remove the plate. In this way any local policeman can easily recognize whether a vehicle is outside its own area, and has only to take a note of the registration number and report it to his superior. The third plate is for the rare occasions when a licence for a third area is granted, and for a special plate which would be issued to an ancillary user in addition to the area plates, to indicate that the owner does not carry for hire and is not included in the area quota. A vehicle licensed for trunk road services would carry a special plate and the plate of any area it is authorized to penetrate off the main road. Every commercial or public service vehicle should be licensed and carry the appropriate plate or plates.

Trunk Road Goods Services to Outlying Areas.

69. The possible number of these services is comparatively limited. Less important cases might be dealt with by extending the ‘B’ licences of selected vehicles if necessary to additional zones away from the railway.

70. A different treatment would seem to be called for in the case of trunk road services connecting important areas with the railway or with each other. In such cases licensing is more likely to be for a particular route than for a zone; moreover, the services should have a certain regularity which can be relied on by the users, together with fixed maximum rates and satisfactory conditions of labour. In return for accepting obligations of this nature and varying with the extent of such obligations, protection from irresponsible competition will have to be granted by reserving licences to one or a limited number of responsible firms who can be relied upon to observe the traffic ordinances and to fulfill the desired conditions. These conditions might include common carrier liability. It is worth mentioning that several cases were brought to my notice of responsible user firms refusing to take advantage of cut throat rates and awarding long-term contracts at fair prices to reliable contractors. /

71. The difficulty is that there are likely to be on these routes a number of stores whose owners have in the past exercised transport business besides carrying their own goods. It might be a waste of transport and involve some hardship under present conditions if these owners were prohibited from carrying for payment, but their licences should be limited to the minimum number of vehicles essential to supply the stores, leaving for the present the right to fill up with paid traffic. Additional licences for ancillary users on trunk roads should exclude the right to carry for hire.
72. A desire has been expressed for through booking with the railway, involving through responsibility, where responsibility exists, for loss or damage, and the possibility of obtaining banking advances on combined waybills. This, however, necessitates a fixed road tariff which would be undercut by independent contractors in good weather and would be left to bear the brunt when the roads are heavy after rain – a difficulty only eliminated if the road in question is genuinely an all-weather road. At present the railways do not give credit for freight payment except on deposit accounts or under bankers’ guarantee, but road contractors have sometimes to agree to a credit account to get the business in competition. Application of railway conditions might therefore lose business to a railway road agent. Such an agent would have to give a bond to the railway covering the railway freight collected at destination and for claims which might arise and for which the road contractor was found responsible. It might be possible to combine the mail contract, a bus contract, and the contract for Government transport with the railway agency in establishing a privileged company which would give the necessary fixed rates guarantee and regular service in return for all traffic consigned on through waybills. Possibly the railway might take a financial participation in such a company, but in the present state of development it is by no means certain that this would be advantageous, especially if the railway contractor was free to compete with other contractors for traffic not consigned on through waybills. It would, however, be preferable to the railways starting feeder services of their own, as in the present conditions of East Africa this could only be done with increased cost and reduced flexibility.

73. It is possible that after a time transport contractors licensed on trunk routes might come to an arrangement to prevent undue competitions. The control organization would have the means of preventing such an arrangement being abused, while securing for the users a better service rendered / possible by the absence of uneconomic competition. A future monopoly of trunk roads serving certain areas, with possibly railway participation, or, on competitive roads, a toll arrangement, would enable the railway type of rate structure to be maintained on such roads, and is a solution which should be encouraged as likely to get over the difficulties which may arise from slantwise roads to the more important areas.

Passenger Services.

Omnibus services.

Analysis of Different Cases.

74. The conditions differ so greatly in the three territories that it will be more convenient to take specific examples to illustrate the alternatives before the control organization.
75. The efficiently run municipal omnibus services in Nairobi and Mombasa, with modern vehicles of suitable design for the purpose, are in a class by themselves. Having been granted a monopoly for these towns, they have been able to establish at a fair price a regular, reliable and comfortable service which was commended to me even from quarters where opposition might have been expected.

76. Uganda, with numerous good all-weather roads radiating from Kampala and Jinja to outlying areas in all directions, is provided with an intensive service of Indian and sometimes native-owned buses, whose proprietors − mostly owning one bus acquired on the hire-purchase system − usually enter the business as a side-line to running a store. The drivers are usually Africans. In the absence of any restrictions these buses have increased in numbers to such an extent as to outstrip by far the demand for transport, with the result that there is an excessive capital employed in the business, and in order to be able to meet hire-purchase payments cut-throat rates are quoted and dangerous racing for passengers occurs on the roads, resulting in many serious accidents. Whatever the nominal fare may be, the actual fare usually obtained appears to average about 3 cents per passenger-mile, and even assuming that the policy of waiting whenever there is a chance of more passengers results in the unusually high load factor of 75 per cent, this means a gross revenue of 49 cents per vehicle mile, which I am told is the lowest figure on which it pays to keep in business. Detours are frequently made without warning to the passengers in order to obtain more fares, and it not infrequently happens that passengers are deposited away from or short of their destination − especially if the bus is lucky enough to be approaching Kampala with an overload. The longest life of a bus in these conditions is stated to be one and a half to two years, with a maximum mileage of 70,000. Police supervision in Kampala ensures the buses leaving with efficient tyres, though the spare tyre, when carried − sometimes in the passenger leg-room, where I have also seen a spare tin of petrol − is frequently in a very worn condition. Further, this supervision, by ensuring that buses for each destination start from the crowded bus park at Kampala in rotation, reduces the delay in waiting and alone preserves the scene from chaos.

77. Certain roads round Nairobi resemble conditions in Uganda, with the important difference that a large proportion of the buses are owned by more responsible people, some of whom have met competition by the introduction of diesel buses of larger capacity but with similar type of body. I suspect that the comparative freedom from accidents round Nairobi is due to the better supervision exercised by the larger owners. The proportion of really all-weather roads is a good deal less than in Uganda. Numerous bus services are in operation in the Kisumu and Arusha areas, where the road conditions are decidedly inferior. All these routes are served by several − in some cases twenty or thirty − daily services.
78. An important feature of these services is that many of the buses leave the main road and perform a useful function by penetrating the side roads and tracks – when weather conditions permit – to serve local markets on their respective days and collect and deliver goods and passengers to and from the main centres. This feature is likely to offer a special problem to the control organization in certain cases.

79. In the bus services in Uganda and in the Nairobi area there is no fixed time-table, and buses start when they have obtained a sufficiently full load, the owner frequently being present – at least in Kampala – to decide the commercial problem of whether it will be better to start with some empty seats in the hope of picking up more lucrative passengers, or to fill up at cut-throat prices before starting. No reliable time-table would be possible in the case of buses going into the side roads, where they may be held up for a variety of reasons. In the absence of any obligations, buses are freely removed from service and either transferred to other areas where the temporary demand seems somewhat greater or diverted to goods work if a more paying load is obtainable on any day, or for a longer period, in which case the body may be changed.

80. Apart from the above cases of bus services on frequented roads, there is the quite different case of services running at much less frequent intervals between certain centres, often for mail purposes, e.g. the weekly service in each direction between Arusha and Nairobi, certain services in Uganda, and the buses operating parallel to the railway between Nakuru and Kisumu. Any such services are liable to competition from existing bus services if part of a regular bus route is followed, and above all from lorries running at irregular intervals and carrying passengers on the front seat or in the body of the lorry under conditions which will be referred to later. Without special privileges or some protection, a regular bus service of this kind may find it difficult to compete with the free lance. It is perhaps from this cause that there is no bus service between the Central Railway in Tanganyika and the Lupa mining area with its European population of about 1,000.

Present Type of Bus.

81. A common feature of all bus services in East Africa is the remarkably uniform type of bus which pervades the whole area outside the Nairobi and Mombasa town services. Mounted invariably on a lorry chassis – usually 2 tons in the case of a standard 22-seater bus – the thin wood floor of the body is three feet above road level. It is surmounted by a strong wooden framework supporting on curved, sharp-edged rafters a roof whose internal height in the centre is 4 ft. 1 in. and at the sides 3 ft. 10 in. above the floor. The external width of the body is under 6 ft. – which certainly facilitates passing on narrow roads. The sides are about 2 ft. high, covered with thin sheet aluminium, with curtains above.
The seats are bare planks, with low planks for back-rests, against which some of
the passengers sit back-to-back. The roof, which is some 7 ft. 2 in. above road
level, is used to carry an unknown quantity of personal luggage, ranging from
bananas to bedsteads, but chiefly the former in Uganda, and this, with the high
floor level, leads to the centre of gravity of a loaded bus being high for racing on
narrow roads with doubtful borders. To save money, the maker’s windscreen is
frequently not bought and a wooden frame with ordinary plate glass is substi-
tuted. This and the flimsy woodwork of floor and roof is stated to aggravate the
effect on passengers of the all too frequent accidents in Uganda. I understand
the normal bus body costs about £30 at Nairobi.

82. Buses are licensed for a stated number of passengers, which is designated
on the body. They are permitted to carry / 140 lb. of merchandise for every pas-
senger short of the quota, and it is a common sight in some areas to see half the
bus filled up with sacks of produce, especially in the case of buses visiting outly-
ing areas where neither passengers nor goods justify separate services.

Need for Improved Type of Bus.

83. In considering the future of bus services, it seems important to discrimi-
nate between services on roads which are good enough for an improved type
of bus with a chassis designed for passenger comfort, and services which must
continue to utilize the lorry chassis as the sole chance of getting through in wet
weather. The present East African type of bus has fulfilled a very useful purpose
in promoting the movement of passengers and goods, but it seemed at first
somewhat surprising that not one case was brought to my notice in which an
improved type of bus had been tried. This is presumably due to lack of capital
for experimental vehicles, and to the necessity for avoiding the slightest increase
in expenditure in the present regime of unrestricted competition. With the
improvement of roads during the last few years the development of bus trans-
port is lagging behind. Any measures for improving the service should, in my
view, stipulate for an improved type of bus for operation on all-weather main
road services. It may take some time to evolve the best type of vehicle for local
conditions. Even on good all-weather roads, the height of the floor level, wheel-
base and length of the body may be governed by the clearance necessary to avoid
any risk of fouling steep rises at culverts or steep dips at drifts; and in view of the
desirability of an internal head-room of 5 ft. 6 in., and the necessity for loading
baggage on the roof, careful thought will have to be given to the possibilities
of keeping the centre of gravity of a loaded bus as low as possible. It might be
found worth while employing a lower chassis on certain roads. The body should
be of steel and will have to be strong but light in order to keep down the gross
weight of a loaded four-wheel vehicle to 4 tons. There is considerable scope for
improvement in the springing and tyre equipment. While avoiding all expensive embellishments, careful attention should be paid to the comfort of the passengers. There is no reason why wooden seats for native passengers should not be curved to afford the maximum of comfort. In cases where European passengers are catered for upholstered bucket seats with high backs and arm-rests, or comfortable canvas seats on tubular frames, will probably pay by increased custom and goodwill. On main road / bus services no goods or cumbersome luggage should be carried in the same compartment as the passengers. Passengers sitting by the driver should be separated from him by a suitable partition.

Solution Recommended for Bus Services in Uganda.

84. In the light of the above conditions, I feel that in Uganda there is no chance whatever of any of the existing bus-owners being able, alone or in combination, to organize and finance a regular and satisfactory passenger bus service on the main routes. On the other hand, no responsible undertaking would risk the necessary capital expenditure without the protection of a monopoly for a number of years over a sufficiently extensive mileage to carry the cost of the necessary overheads. In the circumstances I recommend that tenders be called for for such a monopoly, which might comprise in the first place all main roads radiating from Kampala, with such extensions on branch all-weather roads as are considered necessary to maintain at least the present connections. The tenderers might be called on to produce for trial and approval a bus of the type they propose to employ, and to submit preliminary schedules of running times and charges, particulars of the proposed arrangements for servicing and suitable guarantees for execution. It is a big question how near the present prices such an undertaking could quote. As against the upward correction of the present uncommercial rates through removal of competition, and the inevitable extra cost of regular services with their lower load factor, more expensive vehicles and higher working costs due to better conditions of employment, there should be considerable economies in the avoidance of duplicate services. The present passing juncture offers the chance of handing on in the form of improved service instead of reduced cost the savings which should be effected by the employment of diesel vehicles. Uganda is exceptional in that the native has an appreciation of quality which I have not met with in other countries, and I have little doubt that after a year of operation of the new services, assuming efficient organization, the users would not wish to revert to present conditions. The lay-out of the side roads appears to be such that in nearly every case buses licensed to use them can approach within a few miles of Kampala without using the main road. In such cases they could be authorized to enter Kampala provided they do not pick up passengers over the short section of main road traversed. The control organization would be concerned that an excessive number of buses are not licensed on these roads.
85. The introduction of a monopoly in Uganda is facilitated by a notification which was issued early this year to the effect that existing bus licences would be liable to non-renewal after 1st January, 1938. By starting the new system in the western area it will be possible to mitigate hardship to the best of the existing operators by licensing them in limited numbers on the eastern roads. A certain amount of competition between the two systems for survival after the first period of monopoly, which should not be less than five years, would be a spur to efficiency all round.

Possible Solution for Buses in Nairobi Area.

86. The bus area outside Nairobi seems to call for different treatment, chiefly because of the existence of more responsible operators, but also because of the comparatively large proportion of buses which carry out passenger and goods services in outlying roads. A more detailed analysis of the present situation than I had time to carry out may point to the desirability of licensing a limited number of the more responsible bus undertakings for specified schedules, as in Great Britain, on the main roads, with the obligations of regularity, maximum fares and a definite standard of service with improved vehicles. The schedules could be worked out to eliminate competition between licensees with a view to avoiding cut rates. It will probably not be practicable to prevent the present type of bus licensed to operate mixed services off the main roads from picking up local passengers en route, and in that case they might be usefully allowed to pass on the main roads to Nairobi or other centres at periods when purely passenger vehicles would not obtain a paying load.

Assistance to Less Frequent Bus Services.

87. As regards less frequent services running on certain days only, it is clearly not in the public interest to give a monopoly to the extent of obstructing the movement of passengers travelling on other days, and with the present limited facilities for transport in certain areas I should hesitate to restrict the use of authorized accommodation for passengers on the front seat of lorries. It might be possible to encourage regular bus services which are considered desirable by the grant of the monopoly of bus services on specific days, e.g. for the mail contract and the contract for Government stores, together with arrangements for through booking with the railway for passengers, luggage and parcels.

Conveyance of Passengers on Lorries.

88. This practice, which is one of the special problems in Uganda, requires mention if only to illustrate the comparatively primitive conditions of transport in most parts of East Africa. Under existing legislation, the conveyance of pas-
sengers for payment is prohibited except in vehicles licensed as public service 
vehicles and paying a special fee. These vehicles must be ‘suitably constructed for 
the conveyance of passengers.’ It is, however, almost rare to meet a lorry not car-
rying one or more passengers on the load apart from any carried on the seat by the 
driver. This is notably the case in connection with the sale of seed cotton, when 
the native grower proceeding to a market or ginnery insists on accompanying his 
cotton, at the no small risk, in Uganda especially, of being thrown off the lorry 
when the driver races for traffic on bad roads. This wasteful practice is to some 
extent being reduced by the action of Governments in establishing numerous 
markets near the centres of production, and by the action being taken by ginnery-
owners to pool the produce of their areas and concert measures for reducing the 
free-lance carrying of seed cotton. Incidentally, this measure of co-ordination 
has resulted in an appreciable saving in the number of lorries necessary, owing 
to more efficient use. The legal defence by a driver stopped by the police is that 
the passengers are non-paying, either travelling free with their cotton or friends 
being given a lift. Such free conveyance of passengers is not prohibited, provided 
that in Kenya they are carried safely and in the other territories the maximum 
height of 12 ft. is not exceeded. There is no doubt, however, that carrying passen-
gers on top of loads is frequently a source of private income to the driver.

89. The remedy frequently suggested is more effective police supervision, but 
the question arises whether in many cases this traffic not only can but should be 
stopped. There is not a single bus running on the Great North Road between 
the Rhodesian and Nyasaland frontiers and Arusha. Along this road, with its 
branches to Tabora and to Kilosa and Korogwe, there is a constant movement 
of labour for the mining areas and for the sisal and other estates in Central and 
Northern Tanganyika. Is this labour likely to walk up to 700 miles in each direc-
tion? Can one imagine the driver of a lorry refusing a lift, especially if the traveler 
has a shilling in his hand, seeing that the outward and visible extra cost is nil? 
Could any kind of bus service meet the needs of this uncertain traffic at rates the 
prospective travelers are able to pay? I doubt it, as otherwise it would have been 
done before. It may happen / when wages are higher. Some of these passengers 
are carried quite safely in otherwise empty lorries, others dangerously perched 
on top of a full load. Others I have seen travelling in an empty high-sided lorry, 
but preferring to sit dangerously on the edge of the high sides. The problem is 
to deter drivers from carrying passengers dangerously. I venture to suggest the 
following course for local consideration. Apart from whatever decision may be 
arrived at regarding third party insurance, every lorry-owner should be obliged 
on receiving his registration certificate, to deposit Sh. 500 or a banker’s guaran-
tee for this amount with the Registrar as security for the legal liability of himself 
or his driver in the case of claims from paying or non-paying passengers. In the
case of hire-purchase agreements, the deposit could easily be included by the dealer, who would know that, barring accidents, his client would be in funds to make a deposit on the next vehicle when the previous one was scrapped.

90. While the chief care for the safe carriage of passengers would thus be transferred to the owner and through him to the driver, the new regulations might define what, apart from the question of overload, is the safe carrying of passengers on lorries other than the authorized number on the front seat. A possible definition might call for 12 or 18 inches of ‘free-board’ above the floor or load. This would encourage the use of the high-sided lorry, which is already extensively employed in certain areas. The number of passengers who may legally be carried would thus depend on their safety in each particular case. Legal liability for injury to passengers depends on proof of negligence. Conditions in East Africa justify providing that the carrying of passengers contrary to the above regulations constitutes proof of negligence, or at any rate throws the onus of disproving negligence on the driver. I am informed that a driver who let his owner down would find it difficult to get another job – at least in the same locality. The carriage of passengers on lorries should be absolutely prohibited on regular bus lines, except in the case of employees being carried in the course of their duties.

91. An alternative which has been suggested is to license lorries more easily as public service vehicles, but if fitted as a bus their carrying capacity for good is diminished – a serious matter for long journeys – and loading and unloading are more difficult. If not fitted as a bus, the proposal would merely regularize a possibly dangerous practice without any safeguards. Moreover, the present form of passenger insurance / does not cover non-paying passengers. I imagine, however, that the large majority of lorry-owners would simply carry on as at present under any optional scheme.

**Third Party Insurance.**

92. At present the only vehicles which are obliged by law to be insured are public service vehicles (buses and taxis) in Kenya and Uganda, which alone have – somewhat illogically – to insure against third party risks. In Uganda, insurance against injury to passengers is also compulsory. In practice, a large proportion of commercial vehicles are covered by a comprehensive insurance policy as part of a hire-purchase contract, and the more responsible bus owners outside Uganda also insure comprehensively or their passengers. A good many private cars in outlying districts are stated not to be insured at all.

93. A good deal of attention has been given in all three territories to the possibility of introducing compulsory insurance against third party risks for all vehicles. This is definitely recommended by the Kenya Committee, hoped for
by the Tanganyika Committee, but considered not practicable at present by the Uganda Committee. The insurance representatives all say that it is quite feasible at reasonable rates, and that if any vehicles are excluded it would only be those which in the public interest ought not to be allowed on the road. On the other hand, outside Uganda the number of accidents has not been such as to make the demand for third party insurance insistent, though it is generally recommended in commercial circles and by the more responsible road operator who desires to be protected from what he considers to be unfair competition from uninsured vehicles. With compulsory insurance a few of the owners of these uninsured vehicles might be driven out of business. Owing to the size of the insurance market it is unlikely that this will happen unless the vehicles are a danger to the community.

94. The rates for third party insurance are lower than in the United Kingdom, as might be expected from the lower density of traffic. The total involved in insurance premiums would, however, be high and possibly out of proportion to the claims eventuating until a correct premium rate was arrived at as a result of the experience. On the whole, however, I feel the balance is in favour of compulsory third party insurance being introduced, and recommend that this should be done as soon as satisfactory arrangements have been arrived at with the local insurance agencies to premium. At the start it is worth considering the possibility of a low premium for normal cases and special probationary terms for less known risks which might otherwise raise the general rate. As in Great Britain, workmen carried in pursuance of contract of employment should be covered by compulsory third party insurance. Further reference to the insurance question is made under the heading of draft legislation.

Traffic Regulations.

95. All three territorial committees on transport recommended a tightening up of what I have described in para. 7 as the first category of transport regulation, such as is comprised in the Traffic Ordinances and Rules of the three territories, and there was striking unanimity on this point in the opinions expressed to me from all quarters. The subject concerns the protection of reliable road transport operators from irresponsible competition carried out under dangerous conditions more than the co-ordination of road and rail.

96. The observance of traffic rules and regulations is primarily a question of police supervision. The Kenya and Tanganyika Committees proposed to increase the police for this purpose, and even a small section of police specially charged with the repression of traffic offences would not only tend to reduce some of the common offences, such as speeding, overloading and defective brakes, on the more important routes, but would accumulate valuable experience as to the
suitability of the present regulations for local conditions and the best measures for improving them.

97. The existing regulations prescribe that vehicles must be in good running order, and an inspection is in many cases carried out before a vehicle is given its annual licence. This does not prevent a vehicle being tuned up to pass a test and again being unfit for the road within a short period. It is quite impossible for such vehicles to be inspected often enough to ensure their remaining in sound condition. The best thing would be for them to be scrapped, which some of them would be under any scheme of compulsory third party insurance. Meanwhile it will pay at first to concentrate on defects which are a danger to the public, e.g. brakes, tyres, headlights, and steering gear.

98. I have referred before to the advisability of eliminating as far as possible the necessity for the police to read documents as part of the local control of traffic regulations, and have suggested, in connection with regional licensing, a system of coloured plates which can be supervised by a native policeman only literate to the extent of reading numbers. I feel sure that attempts to make native drivers keep any form of register or log-book would prove to be futile, as even if it is found that a driver can fill in a form in his own language, which seems doubtful, the necessary staff to examine these forms could be better employed on other duties, seeing that even in more developed countries a driver evading the regulations is not likely to incriminate himself or his employer on a return. This would not apply to the keeping of books and waybills by responsible firms licensed as common carriers for specific routes, even if the returns were partly required to check observance of traffic regulations. The time-tables to which public service vehicles would be required to operate would tend to keep the speed of these vehicles within the legal limits.

99. The proposed Licensing Commissions would be concerned with promoting uniformity of traffic regulations as between the three territories. It was suggested to me in Tanganyika that the Kenya system of native registration should be introduced in order to facilitate identification of drivers.

Dhows on Lake Victoria.

100. Figures from official sources vary greatly as to the number of dhows operating on Lake Victoria. Taking a mean, the total number would appear to be between 90 and 100, varying from 10 to 50 tons capacity, of which over 80 per cent are registered in Tanganyika and the balance in Kenya. The large majority are owned by Indian and Greek traders, a considerable part of whose traffic consists of their own trade goods or seed cotton for their ginneries. There are very few dhow-owners carrying only for others and they are said to be making very little profit out of it.
101. Most dhows appear to have a peak season of about six months, when the available capacity is fully utilized and good rates are obtained. For the rest of the year rates fall heavily under the stress of competition for the reduced traffic, and the more important owners use the opportunity for the annual overhaul, which takes up to four months, during which considerable parts of the dhow are replaced, so that a dhow in cover scrapped though every part of it may have changed at least three times during the course of twenty years.

102. From figures given to me it appears that the annual cost of a dhow, allowing for its eight months in commission, varies from 1,900 to 4,800 shillings, depending on the size, allowing 5 per cent depreciation on the original cost. With an annual mileage of 6,400, the cost per ton-mile capacity would vary from 1.5 cents to 3 cents, making the cost per ton-mile 2.5 to 5 cents with a 60 per cent load factor. I was told that a dhow-owner could just make a living on 4 cents per ton-mile, but would expect to get 8 cents during the peak season. In contrast to lorry-owners, it is significant that no dhow-owner appears to have failed financially.

103. At present dhows convey chiefly local produce between lake ports, including points to which a ship or tug cannot go. In 1935 the Kenya and Uganda Railways conveyed over 62,000 tons in and out of Kisumu, but only 4,962 tons of traffic between ports other than Kisumu. Dhows must have conveyed many times this latter tonnage of local produce. Dhows do, however, convey an increasing quantity of lower class imports, e.g. cement and corrugated iron, between Kisumu and Port Bell, being helped by the increase of Kenya and Uganda Railways lake rates in connection with the equalization of rates by the two routes from the Coast to Kampala. Traders complain that this dhow competition upsets the stability of transport rates and confuses the market. Dhows are stated to carry locally manufactured sugar and soap to Mwanza at 6 and 15 cents per ton-mile respectively, as compared with the railway charge of 20 and 38 cents (27 cents for 10-ton lots). Dhows can now insure goods against total loss only, and for limited amounts per consignment and cargo. At present there is little sign of their handling high-class cargo, owing to delays in transport – mitigated sometimes by not having to wait a fortnight for a steamer – inability to insure against damage to cargo (a dhow-owner admitted that sometimes 5 per cent was damaged), and the fact that banks give advances on goods sent by the Kenya and Uganda Railways. If the conditions of working are tightened up, as proposed in several quarters, dhows might possibly as a result carry more high-class traffic. Dhows do not usually carry passengers, who travel mostly by canoes. Bukoba traffic is not competed for by dhows, partly because it is too exposed and partly because it is not a convenient collecting centre.
As compared with the above dhow costs, which must be regarded as purely tentative pending verification, the average variable cost of working Kenya and Uganda Railways lake services, taking the items in Appendix D of Sir Felix Pole’s report on Northern Ireland (see Appendix 2), is stated to have been approximately 5.97 cents per actual ton-mile in 1935. In the case of steamers, however, the out-of-pocket cost of additional traffic would in some cases be extremely small.

The proposal was made to me on several occasions to grant the railway protection from dhows similar to that conceded from road transport. The circumstances are somewhat different, in that the dhows can commercially carry many of the lower classes of traffic which could not be touched by motors. It may even be found that they could convey some of the lower classes of exports at rates at which it would pay the Kenya and Uganda Railways to employ them, having in view the Kenya and Uganda Railways’ out-of-pocket costs for such traffic.

From its nature there seems very little chance of the Kenya and Uganda Railways capturing any large proportion of the extensive traffic in local produce which is now being usefully carried by dhows. The Licensing Commission would not therefore find it necessary or desirable to introduce any restrictions in the present number or operation of dhows. It may be found expedient, however, at some future date, in order to protect the railway rate structure, to impose restrictions as to import traffic competitive with the railways, though this should be even less necessary than at present if the Kenya and Uganda Railways could see their way to forgo the arbitrary mileages between Kisumu, Jinja and Port Bell. It should not be difficult to supervise this limitation.

The dhow-owners ask that the lake should be re-surveyed, particularly in the vicinity of minor ports recently opened up. The only organization for doing this appears to be the Kenya and Uganda Railways. They would claim to be reimbursed for any expenditure outside their normal routes, but in so far as the dhows act as a feeder service they are entitled to some consideration from the two railways. The only expenditure on lake navigation in 1935 amounted to £950 by the Kenya and Uganda Railways. The amount paid in special taxation by dhows amounted to £34 in registration fees, in addition to which some £2,615 was paid in wharfage and jetty charges, which at least partly represent payment for facilities provided. It would seem reasonable that sufficient revenue should be raised by registration or other fees to cover the cost of any work on the lake exclusively in the interest of the dhows. The recommending authority for such work might be the proposed transport control organization. It is noted that legislation is likely to be enacted shortly introducing uniform dhow fees for Tanganyika and Kenya.
Air.

108. East African territories are fortunate in being traversed by the bi-weekly Imperial Airways service to the Cape, which at present enables the journey from London to Nairobi to be made in 5 1/2 days, a period which will shortly be reduced to 3 days. These services are subsidized by the three Governments. They are equally fortunate in possessing a most efficient local air service with a clean sheet as regards accidents, which commands universal confidence and has done much to make East Africa and particularly Tanganyika air-minded. This service, in which Imperial Airways now have an important interest, at present holds no monopoly, but receives small subsidies in respect of mail contracts, besides holding a contract with the Tanganyika Government for the provision of planes for charter services. Regular services are run between Nairobi and Lindi, via Mombasa, Tanga and Zanzibar, and from Nairobi to the Geita Mine, via Kisumu, Musoma and Mwanza – a service which incidentally confers an important competitive advantage on the Mombasa route as an outlet for Tanganyika lake ports. In addition, the company carries out a large amount of charter work, particularly for the Tanganyika Government, in virtue of a very fair contract safeguarding the company against loss whilst making it pay the Government to use air transport as much as possible in preference to road transport. The company in question in 1935 flew 462,882 miles and carried 2,371 passengers. Until recently there was a rival company which in 1935 flew 172,893 miles and carried 1,278 passengers, chiefly to and from the mining areas. The latter company has recently gone out of business.

109. It is well known that air services cannot expect to pay unless each plane is fully employed at reasonable rates – which in the case of a regular service means with a satisfactory load factor – and unless the total traffic is sufficient to support the expensive ground service and overheads essential for safe and reliable working. There are many small air services which have gone out of business through non-fulfilment of these conditions. Moreover, the advocates of competition would be the first to complain if the resulting cutting down of costs of working reduced the quality of the service, a risk the Government concerned cannot afford to take in view of the extensive use made of air services by Government officials and the necessity at present to employ single-engined machines for long cross-country journeys.

110. I have no hesitation therefore in recommending, as the best policy for local air services in East Africa, that a monopoly should be offered on suitable terms to the present company for at least five years, thereafter subject to review at not less than two years’ notice, the company to carry out any additional regular services beyond those in the original contract if offered a guarantee of minimum gross revenue per mile specified in the contract, and to have the monopoly of charter services for payment in East Africa, the maximum rates for which would be laid down in the contract.
111. There is no doubt that future air services will compete more and more for the present limited first-class passenger clientele of the railways. In order therefore that the railways may have every inducement to co-operate freely with the air services, and less temptation to hanker after railway air services, I feel strongly that the two railway administrations should be admitted to a participation in the capital of the privileged air company – say, to a combined extent of 30 per cent – and should be represented on the local board, the chairman of which should always be from the air side.

112. The control of air services in matters of safety and convenience of the public (first category of control) is a highly technical matter which would be dealt with in each territory by the officer performing the duties of Director of Civil Aviation. It is evident that the regulations in the three territories should be uniform. It is understood that an expert from Great Britain will shortly be delegated to advise on these questions, which are outside the scope of this report.

113. It is noted that the total Government expenditure on air ground services, chiefly aerodromes, up to date, with total revenue from landing fees, etc., amounts to:

<table>
<thead>
<tr>
<th></th>
<th>Expenditure</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya</td>
<td>63,900</td>
<td>8,600</td>
</tr>
<tr>
<td>Tanganyika</td>
<td>19,900</td>
<td>2,600</td>
</tr>
<tr>
<td>Uganda</td>
<td>8,100</td>
<td>800</td>
</tr>
</tbody>
</table>

In this respect, air services are, as might be expected, still in the subsidized stage.

**Road Policy.**

**Road Costs and Motor Taxation.**

114. Road vehicles are taxed more lightly in East Africa than in Great Britain. Nevertheless, it is a striking fact that in 1935 the total expenditure on roads, including overheads and loan charges but excluding expenditure on new roads from loan funds, was less in two of the three territories than the revenue from road sources (excluding, to obtain uniformity with the figures available, import duties on motor cycles, bicycles, and kerosene). The figures supplied to me are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Expenditure</th>
<th>Revenue</th>
<th>Revenue Surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya</td>
<td>151,474</td>
<td>207,974</td>
<td>56,500</td>
</tr>
<tr>
<td>Tanganyika</td>
<td>109,489</td>
<td>85,519</td>
<td>23,970 (Deficit)</td>
</tr>
<tr>
<td>Uganda</td>
<td>65,673</td>
<td>80,085</td>
<td>14,412</td>
</tr>
</tbody>
</table>
It has been advanced that in these calculations depreciation should be provided for in the case of the more important public works. It is, however, not unsound for replacements to be effected out of current revenue at the expense, if need be, of betterments in years when any particularly heavy renewal has to be carried out.

115. It has also been proposed that the annual expenditure should include an amount representing interest on all expenditure of a capital nature where non-interest-bearing money has been utilized. The difference between capital, betterment and maintenance expenditure is a somewhat shadowy one. The figures of past road expenditure and revenue are difficult to establish, and I am told cannot be relied on for all territories prior to 1923. The extent of the use of the roads apart from taxpaying motor vehicles – the community use – is impossible to assess, though far less in proportion than in more developed countries. In the circumstances, I suggest that if it is desired to arrive at some basis for comparing expenditure for the benefit of motors with revenue from road motor sources, it will be fair to ignore all revenue and expenditure prior to 1923 and to set off interest not represented by loan charges against the community use of roads. / 

116. If on this basis a rough figure is required for the ‘legacy of the past’ or the extent to which road transport has been subsidized in its initial stages, perhaps the simplest way would be to take into account, for the years 1923 to 1935 inclusive, the total expenditure on new construction, betterment and maintenance, including estimated overhead charges and loan service charges on the one hand, and the total revenue from road sources on the other hand. The result is approximately as follows:–

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>Revenue</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>£</td>
<td>£</td>
<td>£</td>
</tr>
<tr>
<td>Kenya</td>
<td>2,652,000</td>
<td>1,833,000</td>
</tr>
<tr>
<td>Tanganyika</td>
<td>1,849,000</td>
<td>549,000</td>
</tr>
<tr>
<td>Uganda</td>
<td>1,108,000</td>
<td>590,000</td>
</tr>
</tbody>
</table>

The importance of balancing road revenue with road expenditure as a basis of road and rail co-ordination can easily be exaggerated, particularly if unrestricted competition is ruled out. The chief utility in the present instance appears to be to encourage the Treasurers to claim that at least the Customs duties are part of general revenue, with no obligation on the Government to use it for road purposes in view of the accumulated debit balance still to be wiped off. The precedent of the Road Board in Great Britain would seem to justify the view that there is little significance in relating road expenditure and revenue from road sources in any budgetary accounts. At the same time, I can well imagine that the proposed control organization, having established a rough-and-ready basis for the past, or accepting the above figures, would keep up-to-date records of future road expenditure and revenue from road sources as a guide to the economic cost
of road transport, and I have no doubt that these figures will be used from time to time by the road interests to support claims for better roads, lower taxation, or a larger allocation of traffic.

117. In considering the division of function between road and rail in para. 29, a rough figure was assumed for motor taxation per ton-mile of traffic carried. The following analysis, based on the revenue and expenditure shown in para. 114 and on assumed annual mileages and gross weights of the different classes of vehicles, is of interest in this connection:

<table>
<thead>
<tr>
<th></th>
<th>Kenya</th>
<th>Tanganyika</th>
<th>Uganda</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Miles</td>
<td>79,053,000</td>
<td>39,416,000</td>
<td>46,906,000</td>
<td>165,375,000</td>
</tr>
<tr>
<td>Average Road Taxation from all Sources per Vehicle-mile</td>
<td>5.3 cents</td>
<td>4.3 cents</td>
<td>3.4 cents</td>
<td>4.52 cents</td>
</tr>
<tr>
<td>Average Road Expenditure (excluding Capital Expenditure out of Loan Funds) per Vehicle-mile</td>
<td>3.8 cents</td>
<td>5.5 cents</td>
<td>2.8 cents</td>
<td>3.95 cents</td>
</tr>
<tr>
<td>Gross Ton-miles (Vehicle plus Average Load)</td>
<td>123,241,000</td>
<td>81,999,000</td>
<td>115,660,000</td>
<td>320,900,000</td>
</tr>
<tr>
<td>Average Road Taxation per Gross Ton-mile</td>
<td>3.4 cents</td>
<td>2.1 cents</td>
<td>1.4 cents</td>
<td>2.3 cents</td>
</tr>
<tr>
<td>Average Road Expenditure per Gross Ton-mile</td>
<td>2.5 cents</td>
<td>2.7 cents</td>
<td>1.1 cents</td>
<td>2.0 cents</td>
</tr>
</tbody>
</table>

In the interest of economic development it is of course undesirable that transport should be taxed for general revenue, though it is open to argument whether, with a properly coordinated transport system, general revenue required to assist one essential form of transport should not where possible be procured from levies on other forms of transport.

118. Incidentally, there seems no reason why the registration taxes in the three territories should not be on the same basis. At present they differ both in method of calculation and amount. Particulars of motor vehicles in the three territories in 1935 are given for reference in Appendix 3.

**The Condition of the Roads.**

119. The roads in East Africa, outside a few of the larger towns, are in no case properly metalled. The normal main road consists of an earth surface carriageway up to 16 feet wide on a graded and drained formation, with permanent bridges, culverts or drifts in steel or concrete. In places where material can be found at hand, and particularly in Uganda, the surface is improved by treatment with gravel or laterite (murrum), this being absolutely essential for an all-weather road in sections running over cotton soil, where it may also be necessary to lay a foundation of corduroy, usually consisting of cross poles from 3 to 6 in. in diameter.
120. The surface of these roads is easily cut up in wet weather, the non-gravel roads being impassable for varying periods after one or two days’ heavy rain. Deep ruts are formed, and to prevent the whole road being destroyed, lorry traffic, and sometimes all traffic, is suspended by order, sometimes for weeks at a time. Gangs, which may be more correctly described as repair than maintenance gangs, go over the surface, filling in ruts by hand or grader, pending which traffic passes astride the deepest ruts as soon as the surface is dry enough to bear it. A well-made gravel road can be kept passable at all times. It was constantly impressed on me that on East African roads an overloaded 3-ton lorry passing at over 30 miles an hour does damage quite out of proportion to the lighter forms of traffic. In the circumstances, the present system of an upper limit to the taxation of lorries, especially in Tanganyika and Uganda, appears to be unduly favourable to the heavier lorries, which are likely to do most damage.

121. Uganda possesses a large mileage of Class 1 and Class 2 all-weather roads scheduled to take vehicles of 4 tons and upwards gross weight, though comparatively few buses and lorries exceed this limit, as they would be unable to pass over the lesser roads for considerable periods.

122. The situation in Tanganyika may be realized by the recommendation made to the Tanganyika Road and Rail Committee that the main roads (in this case the principal trunk road in the Territory) should be constructed so as to enable the use of heavy motor units for at least nine months in the year.

**Suggested Priority of Road Expenditure.**

123. The impression I formed in the course of passing over various roads in the three territories is that on the trunk feeder roads it is more important to begin by building really reliable all-weather roads for lorries up to, say, 2½ tons capacity than to try and provide for heavier vehicles, which add to the cost of maintenance and run the risk of cutting up the roads in wet weather and interrupting regular communications. The saving in the cost of operating the smaller vehicle on an improved and reliable all-weather road surface would be an important set-off to the saving in the cost of operating a larger vehicle with deterioration of the road surface, and there would be the advantage of uniform rates at all times of the year, with increased stability of prices and the possibility of through booking with the railway.

124. The general opinion in Kenya and Tanganyika was in favour of using available funds in the first place to provide additional feeder roads rather than roads parallel with the railway, holding that cheaper road transport for feeder services will widen the area of production. This is a sound policy provided the cost is carefully weighed against the expected advantages. It is no use spend-
ing large sums on a road with a prospective traffic of five vehicles a day. For this reason the more frequent carrying out of traffic censuses on roads likely to be considered for improvement is strongly recommended.

125. The time will come, however, when the interests and convenience of the private car owner, who contributes so large a proportion of the road revenue, will justify the construction of good roads between important centres, even if they are virtually reserved for passenger traffic through the operation of the licensing of goods vehicles. I consider it is more important, however, to bring the chief trunk feeder roads up to an all weather standard for heavier vehicles. In any case there is unlimited scope for using available funds for the improvement of the road system, especially in Kenya and Tanganyika.

Transport Commissions.

126. Assuming that the policy of the control of all forms of transport, by licensing is decided on, the form of organization entrusted with this duty requires very careful consideration.

127. The Road-Rail Reports of Tanganyika and Kenya and the Accidents Report of Uganda, approaching the problem from somewhat different angles, all propose that the executive licensing organization for the territory should be composed of members not seriously interested in transport undertakings, and with this I fully agree. Any organization consisting of a balance of interested parties would have the disadvantage of taking time to acquire an impartial outlook in the public interest, by which time there would be the risk that members might have lost the support of the interests they were selected to represent. Moreover, East Africa is a long way off any association representing the road transport operators, whose interests are not always the same as those of dealers in the motor trade, so that any partisan organization could not be properly representative. A further disadvantage would be the unavoidable size owing to the interests which would claim representation, thus reducing both the chance of agreement and the possibility of finding members of the right calibre.

128. For the licensing authority, which might be designated the Transport Commission in view of the wider aspects of its functions, I recommend a body of five members with a quorum of three for the reasons advanced in the Kenya Report. While the primary qualification for membership should be personal suitability irrespective of whether official or unofficial members are chosen, I envisage appointments on the following lines: One member with legal qualifications, two members commanding the confidence of the European and Indian communities respectively, one official member to watch the interests of the native population, and one member with a general economic outlook, such as
a banker. The chairman need not necessarily be an official member. An active whole-time secretary, recruited from the commercial community or from the official staff, and preferably not previously associated with any form of transport, will be an important element in the functioning of the Commission. The actual issuing of licences in accordance with the broad lines laid down by the Commission would have to be carried out in most cases locally, and, as in Nyasaland, the appropriate authority would seem to be the District Administrative Officers, for whom the procedure would have to be simplified as much as possible.

129. The alternative has been suggested of having a full-time chairman with experience in licensing in other countries, but I consider this expense should be unnecessary, unless experience shows that it is desirable to centralize the details of licensing instead of delegating them to the local authorities, in which case the whole-time chairman would be the licensing authority, at least for goods vehicles, as in Great Britain.

130. East African territories cannot afford too many cooks, and I therefore recommend that these Commissions should not only have executive licensing functions but also act as Advisory Commissions on transport to their respective Governments. Incidentally, it will be desirable to alter the designation of the High Commissioner for Transport to some more accurate designation, such as 'High Commissioner for the Kenya and Uganda Railways and Harbours'.

131. As for the important matter of inter-territorial coordination of transport policy, I recommend that this should be assured by an Advisory Transport Committee consisting of two delegates from each territorial Transport Commission, with a part-time secretary, who might be the Secretary to the Transport Policy Board. If after consideration it is considered desirable at the commencement to import experienced assistance from outside, this might take the form of one advisory expert for the three Governments, functioning as adviser to each of the three Commissions and as chairman of the Advisory Committee. This committee should meet by agreement as often as necessary to concert uniformity of transport practice, and in any case shortly before the annual meeting of the Governors in their capacity of the Transport Policy Board. /

132. The above proposals are designed to reduce to a minimum the machinery necessary for carrying out a combined transport policy. I have endeavoured elsewhere to suggest how the task before the Commissions might be cautiously approached, not only to avoid undue interference with existing transporters but to avoid calling on the members to undertake a lot of detail work.

133. In view of the importance of avoiding the chance of an inequitable decision in particular cases, it is usual to provide for appeal from the decisions of the licensing authority. In the Kenya Report an appeal to the Supreme Court
Draft Legislation.

134. While the general lines of the draft legislation in the Kenya Report would seem to be suitable for the matter dealt with when it is recognized that powers have to be taken which may apply only to exceptional cases, it will evidently be necessary to review the draft in the light of such of the recommendations in this report as may be adopted by the Government. I had occasion to suggest the following as being among the points on which some modifications of the present text seems advisable.

135. ‘A’ licences should be for specific areas or routes, and not general as in Great Britain, or the whole structure of the proposed system of control would be undermined. It may be difficult to stipulate that an ‘A’ licensee must have no other business. Possibly a distinction might be that he accepts the obligations of a Common Carrier.

136. Provision should be made for long-term agreements, e.g. air or bus monopolies. It is understood that such agreements would be confirmed in each case by special legislation.

137. I understand legislation is required in East Africa corresponding with the Law Reform (Miscellaneous Provisions) Act of 1934 in England, to protect the injured party in cases where the person causing the injury is killed in the accident.

138. The provisions regarding third party insurance require special study to bring them right up to date with any British legislation resulting from the report of the committee now considering the question – in particular as regards the protection of the injured party from repudiation of the policy by an insurance company for reasons beyond the injured party’s control.

139. For similar reasons it might be provided that in case of change of ownership of a vehicle the old owner is not released from liability to claims until such
change is registered, and, where prescribed, the name of the new owner substituted on the vehicle.

**Competitive Railway Measures.**

140. I have considered it outside my terms of reference to deal with questions affecting purely railway operation. Until recently both railways have been struggling to avoid losses during the crisis. Now that the Kenya and Uganda Railways are earning substantial profits as a result of a renewed accession of traffic, it may be a question whether they should return all their surpluses in the form of reduced rates or whether some part might now be used to build up goodwill by improved services rightly ruled out under the regime of rigid economy. It occurs to me that the institution, if line capacity can be made available, of a speeded-up daily daylight rail motor service between Mombasa and Nairobi might be a useful step to forestall the day when there will be a good motor road between these places.

**Distribution of Lake Traffic Between Kenya and Uganda Railways and Tanganyika Railways.**

141. This question was raised at the majority of meetings with Chambers of Commerce as a case of co-ordination between rail and rail due for revision. Stated very briefly, the previous history is that until 1928 the only outlet for traffic served by the whole of the lake area was via the Kenya and Uganda Railways and Mombasa. In spite of opposition from the Kenya and Uganda Railways on the grounds that there was insufficient traffic for two separate routes, it was decided as a matter of policy to construct a branch from the Tanganyika Railway at Tabora to Lake Victoria at Mwanza. It is difficult to imagine Dar es Salaam being denied access to the trade of a quarter of the population of Tanganyika Territory, quite apart from the administrative advantages of the Mwanza connection. The question then arose as to what traffic should use the new route, it being evidently necessary to avoid the financial loss which would have resulted from competition between the two transport routes, each of which was, in case of deficit, liable to be subsidized by the British Government or the Local Administration. It was ruled by the Secretary of State in 1928 that such competition at Mwanza should not be allowed to take place, the terms of the decision being ‘that non-competitive rates should be arranged, leaving trade to take its natural course.’

142. This decision was implemented by an agreement virtually permitting the Kenya and Uganda Railways to retain their lake traffic on all points except Mwanza, from which place alone the rate to the coast either to Dar es Salaam or to Mombasa was equalized; whereas the rates from other Tanganyika lake ports, e.g. Bukoba and Kagera River, were made higher via Tanganyika than
via Kenya by the cost of getting traffic across the lake – generally by Kenya and Uganda Railways steamers at local rates. These local rates are of course, owing to the operation of the taper, considerably higher than if a through rate had been quoted from Dar es Salaam for the above ports.

143. Mr. Gibb in his report in 1932 recognized that it would be difficult to perpetuate this arrangement in view of the natural claims of Dar es Salaam and the Tanganyika Railways. He proposed to meet what he considered to be the superior claim of Kenya by a division of traffic under which Kenya would retain the whole of the existing traffic and should take 50 per cent of any additional traffic beyond the existing tonnages, or alternatively that Kenya should have 80 per cent and Tanganyika 20 per cent of the total traffic. Mr. Gibb suggested a rating policy which should favour Mombasa, in compensation for which the Kenya and Uganda Railways should pay the Tanganyika Railways a fine for all tonnage in excess of their pooled proportion carried over their route; such fine being based on the railway profits earned on this traffic and arrived at by deducting from the gross receipts only average out-of-pocket costs pr ton-mile. Owing to the slump and diminution of traffic no action was taken as regards pooling the late traffic.

144. In December, 1934, the Secretary of State, referring to Mr. Gibb’s report and to recommendations of the Governors’ Conferences in October, 1933, and May, 1934, decided that no change should be made in the status quo, but that the questions should be opened when the total traffic from and to the Tanganyika lake ports (exclusive of traffic from Kagera River) again reached a figure of 27,000 tons per annum, which was the tonnage handled by the Kenya and Uganda Railways prior to the building of the Mwanza line. It was left to the Governors’ Conference to reopen the matter at any time, and the Conference was enjoined to keep it under close review in order that the possibilities of some alternative arrangements in future might not be overlooked.

145. The above figure of 27,000 tons was exceeded in 1935 for all Tanganyika ports (except Kagera River), including all purely land traffic to and from Mwanza. The approximate tonnage and traffic revenue by the routes in 1935 was as follows:–

<table>
<thead>
<tr>
<th></th>
<th>Tons</th>
<th>Revenue £</th>
<th>Tons</th>
<th>Revenue £</th>
<th>Tons</th>
<th>Revenue £</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mwanza Other</td>
<td>10,895</td>
<td>72,181</td>
<td>4,420</td>
<td>20,859</td>
<td>6,475</td>
<td>51,322</td>
</tr>
<tr>
<td>Ports except</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kagera R.</td>
<td>18,317</td>
<td>102,234</td>
<td>17,708</td>
<td>98,038</td>
<td>609</td>
<td>4,196</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>29,212</td>
<td>174,415</td>
<td>22,128</td>
<td>118,897</td>
<td>7,084</td>
<td>55,518</td>
</tr>
</tbody>
</table>
146. Of the traffic with Tanganyika ports excluding Mwanza, Bukoba contributed some 11,528 tons of exports, chiefly coffee, for dealing with which superior facilities exist at Mombasa, and 2,117 tons of imports, with a total revenue of £78,749, leaving only 4,863 tons and £23,804 revenue from other sources. It is difficult to see, therefore, how the Tanganyika route can hope to get more than 15 per cent to 20 per cent of the non-Mwanza traffic under any arrangement for some years. It must be remembered that Dar es Salaam wants a fair share of traffic actually to pass through that port. It is to them a secondary, though important, matter that the railway should not be compensated in the event of the rating agreement not leading to the agreed division of traffic. /

147. After very careful consideration of this problem in all its aspects, I am left with the definite impression that too much weight is now being given to the fact that Kenya was first in the field. It seems reasonable that if destructive competition between the two systems is rightly forbidden, this should not mean, especially after the lapse of time which has occurred, that a new and possibly in some cases more convenient route should be prevented by rate discrimination from obtaining a share of traffic hitherto carried by the previously existing route. It seems fairer and economically more sound to revert to the Secretary of State's decision of 1928 whereby absence of competition was taken to imply that the two routes should be allowed to function in accordance with their relative advantages.

148. The suggestion has been made that the policy for the division of lake traffic should be that which would be adopted by a General Manager of a combined Kenya, Uganda and Tanganyika Railway. Such a General Manager would tend to adjust rates so that after paying out-of-pocket expenses (i.e. that part of the working costs which varies with the tonnage carried) the same balance becomes available by either route towards meeting fixed operating charges (including renewals of fixed assets), overheads and interest for the combined systems. One would expect out-of-pocket expenses per ton-mile to be roughly the same on both railways, so that theoretically rates between all points of the lake and the two sea-ports would differ by the difference in the actual mileages from each point to the two ports multiplied by the out-of-pocket cost of working. Practical considerations would force the combined General Manager to take account of the interests of the different areas served by his railways – e.g. the competing claims of Dar es Salaam and Mombasa. Thus the General Manager, in allotting the traffic, might have to take into consideration what the probable situation would have been if the relative claims had been settled through a rate war. As a result it frequently happens in practice elsewhere that the same rate is quoted to competing ports even though there may be an appreciable variation in the distances.
149. Taking the actual railway distances, and the actual steaming distances by Kenya and Uganda Railways steamers in the shortest direction round the lake, as a fair mean between the direct sailings of the supplementary lighter service and the longer route round the lake followed by alternative steamers, the comparative distances from Mombasa and Dar es Salaam to Tanganyika lake ports are as follows:–

<table>
<thead>
<tr>
<th>Miles.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mombasa to Bukoba</td>
<td>917</td>
</tr>
<tr>
<td>Dar es Salaam to Bukoba</td>
<td>871</td>
</tr>
<tr>
<td>Distance in favour of Dar es Salaam</td>
<td>46</td>
</tr>
<tr>
<td>Mombasa to Musoma</td>
<td>724</td>
</tr>
<tr>
<td>Dar es Salaam to Musoma</td>
<td>883</td>
</tr>
<tr>
<td>Distance in favour of Mombasa</td>
<td>159</td>
</tr>
<tr>
<td>Mombasa to Mwanza</td>
<td>848</td>
</tr>
<tr>
<td>Dar es Salaam to Mwanza</td>
<td>759</td>
</tr>
<tr>
<td>Distance in favour of Dar es Salaam</td>
<td>89</td>
</tr>
</tbody>
</table>

The distance from Mombasa to Bukakata is 834 miles as compared with Dar es Salaam to Bukakata 954 miles, the distance in favour of Mombasa being 120 miles. From these distances the traffic watershed appears to lie north of Bukoba and south of Musoma.

150. The inclusion of port charges at Mombasa and Dar es Salaam would tend to complicate the issue, in that while export charges are roughly speaking the same at both ports, import charges are on an ad valorem basis at Mombasa and on a flat tonnage basis at Dar es Salaam, resulting in considerably higher charges at Mombasa for certain commodities. The actual out-of-pocket working expenses are considerably less at Mombasa than at Dar es Salaam, but a larger sum is required at Mombasa to meet fixed charges, including interest on the capital cost of the port. Thus the combined General Manager would prefer traffic to pass via Mombasa, while the user would balance the advantage of Mombasa against the extra cost. In the circumstances the General Managers are agreed that port charges should not be taken into consideration in the rating policy for the division of lake traffic. This decision favours Tanganyika slightly. /

151. Taking account of all the above considerations, I recommend the new arrangement should be on the following basis:–

(1) The present Kenya and Uganda Railways rates with Mombasa to apply equally to Dar es Salaam for all Tanganyika ports, except Kagera River, which has always been regarded as a Uganda port. Through booking facilities to apply by both routes. Certain minor rate anomalies on the Tanganyika Railways may have to be adjusted.

(2) The traffic to be allowed to take its natural route.
(3) Through rates and through booking to apply between other lake ports and Dar es Salaam, the through rate being based on the railway taper for the various classes applied to the same lake mileages as are being used by the Kenya and Uganda Railways for tariff purposes; subject to no low class rate being fixed at less than the out-of-pocket cost of working specially calculated for the particular traffic. Division on a mileage basis.

(4) The revenue from traffic with Tanganyika ports to be pooled, division of profits being based on the assumption that 70 per cent of the Mwanza import and export traffic (measured by gross revenue) will pass via Dar es Salaam. ‘Distribution traffic’ to be included. Profit to be calculated by deducting out-of-pocket expenses, as proposed by Mr. Gibb and substantially as defined by Sir Felix Pole, at an agreed average rate, or different rates for different traffics, from gross revenue. This profit to be divided in the above proportions between the two routes, Kenya and Uganda Railways to receive their share of the profits allotted to the Tanganyika route on a mileage basis.

(5) Passengers, luggage, live stock, vehicles and all other traffic to be dealt with on the same basis as goods.

(6) Kenya and Uganda Railways lake service to retain full revenue from purely local traffic between Tanganyika lake ports.

(7) A minor point relating to a small allowance for the use of Tanganyika lake wharves can easily be settled between the Railways.

(8) The whole arrangement to be subject to review after five years, unless the East Africa Transport Policy Board instruct that an earlier review be undertaken.

The above proposals assume that the Tanganyika Railways are not allowed to start any competitive lake service and on the other hand that the Kenya and Uganda Railways lake services are operated so as not to discriminate in any way against the Tanganyika Railways – a condition which will be facilitated by a pooling arrangement on the lines suggested. In the circumstances it should not be necessary for Tanganyika to acquire an interest in the Kenya and Uganda Railways lake steamer services.

152. It is evident that the actual flow of import and export traffic under the above proposals will depend on the trade advantages of the two routes. This is where the Kenya and Uganda Railways will reap the advantage of being the first in the field. For example, it seems clear that practically the whole of the Bukoba coffee would continue to pass to Mombasa, even in the face of a higher rate, on account of the existing facilities for curing and marketing coffee. In the course of time similar facilities may be found to be commercially justified at Dar es Salaam, but it would defeat the policy of transport co-ordination and the spirit
of the proposed arrangement if any attempt were made to subsidize such facilities on a non-commercial basis. On the other hand, commercial activity should not be hampered by the failure to provide, by either route, the usual facilities necessary for dealing with any resulting increase in traffic.

**Division of Traffic of Moshi District Between Mombasa and Tanga.**

153. Recommendations were made by the East Africa Commission in 1925, the East Africa Guarantee Loan Committee in 1926, the Hilton Young Commission in 1928, and by General Hammond in 1930, that the Tanga Line should be handed over to the Kenya and Uganda Railways on terms to be considered. No agreement has been found possible as to the terms for such taking over.

154. With a fresh start, ignoring territorial divisions, one would expect the Moshi area to be served by Mombasa, while Tanga remained a small local port serving a hinterland extending for about 100 miles. General Hammond in 1921 and Mr. Gibb in 1932 proposed to create such a situation by pulling up part of the Moshi-Tanga line and handing over the Arusha-Moshi-Kahe section to the Kenya and Uganda Railways. Mr. Gibb stipulating that in return for the advantages of getting all the traffic the Kenya and Uganda Railways should hand over to the Tanganyika Railways the whole of the revenue of traffic of the Moshi area to and from the coast, less only out-of-pocket costs of hauling, depreciation and a small charge for supervision. The Secretary of State, in his despatch of 4th December, 1934, confirmed the recommendation of the Tanganyika Government that no part of the railway should be dismantled, and noted the opinion of the Governors’ Conference that the present basis of compensation payable to the Tanganyika Railways should stand until there had been an increased volume of trade and traffic on the Voi-Kahe line – pointing out that the Governors’ Conference would naturally keep the matter under review with a view to its being reopened at any time.

155. The present arrangement is that the rates from Moshi to Mombasa and Tanga should be assimilated, running power charges being paid by the Kenya and Uganda Railways over the sections Taveta to Moshi and Moshi to Arusha, together with a ‘branch line contribution’ for traffic conveyed over the Arusha branch. The distance Kahe-Mombasa is 11 miles shorter than Kahe-Tanga, which is 206 miles. The Voi-Kahe line has, however, very steep grades. Since 1933 the import and export traffic to and from the Moshi area over the Voi-Kahe line has increased from £21,310 to £34,605, 47 per cent of tonnage or 57 per cent of revenue passing via Mombasa. Seventy-five per cent of the coffee passes to Mombasa on account of the established curing and marketing facilities; the recent erection of a curing mill at Moshi may, however, operate in favour of Tanga;
practically all sisal goes to Tanga. Imports come from Mombasa in the case of firms established at that port, and from Tanga from certain firms not established at Mombasa. Mombasa favours certain goods on account of shipping facilities; e.g. Japanese vessels and the B.I. Indian service do not call at Tanga.

156. The annual interest charges on the British expenditure on the Tanga line and port amount to £56,198. As regards the German capital, valued at £880,000, no interest is paid, but there is an arrangement that any renewals are to be carried out by capital expenditure. No separate accounts have been kept, but it is understood that the Tanga line has always been a burden to the Tanganyika Railways, and its net earnings do not cover the interest charges and depreciation on the / British assets. If the whole of the present Moshi traffic went to Tanga the additional gross revenue to the Tanganyika Railways might be roughly £40,000 for an additional tonnage of 15,000. The Tanganyika Railways are not in a position financially to claim a lower rate to Tanga with a view to regaining some of this traffic. More drastic action would be against the policy of non-competition and contrary to the interests of the Moshi area.

157. The saving in working expenses by transferring the Tanga line to be worked by the Kenya and Uganda Railways on behalf of the Tanganyika Railways would be too small to be worth any change. If the Kenya and Uganda Railways were to run the Tanga line as part of their system and for their own account, and in consequence introduce throughout the Tanga line the lower rates in force on the Kenya and Uganda Railways, there would be increased loss on the Tanga line. Moreover, as regards rates for the Moshi area, the Kenya and Uganda Railways could not do otherwise than maintain the present equality between Mombasa and Tanga. On the other hand, if the Tanga line were to lose increasing traffic to the Kenya and Uganda Railways without compensation, it would ultimately be much worse off than under the arrangement proposed by Mr. Gibb and accepted by the Kenya and Uganda Railways. The counter-proposal of the Tanganyika Railways is understood to be that the Kenya and Uganda Railways should pay half the profit from the Moshi traffic with Mombasa.

158. Mr. Gibb’s solution being ruled out on general grounds and there being no inducement to the Kenya and Uganda Railways to take over the Tanga line on terms likely to be acceptable to the Tanganyika Government, perhaps the fairest course would be to stabilize the situation by a pooling agreement based on division of net profits from the traffic as between Kahe and Mombasa and Kahe and Tanga, in the proportion of 55 per cent and 45 per cent respectively, calculated on the principle suggested for Lake Victoria traffic, and by eliminating the present branch line contribution paid by the Kenya and Uganda Railways. The present arrangement for running powers would not be affected.
Competition with the Sudan.

159. It should not be overlooked that there appears to be an appreciable and growing competition with the Sudan Railways in connection with certain areas in Uganda. I would draw attention to Mr. Gibb’s recommendation that the railways should settle upon the areas to be served by each and should agree to rates which carry out the policy adopted.

Amalgamation of Kenya and Uganda Railways and Tanganyika Railways.

160. Suggestions were made on several occasions that the Kenya and Uganda Railways and Tanganyika Railways should be amalgamated. The same considerations would, however, appear to apply as for the Tanga line. There is no railway or financial inducement for the Kenya and Uganda Railways to accept a complete financial merger of the two systems, all the benefit of which would – at least, for some years to come – accrue to Tanganyika. It is inconceivable that the Tanganyika Government would agree to any lessening of its control over its main artery of communications for the sake of the minor savings which might result from a combined management, and there seems little hope of agreement on any intermediate basis. Nor would such a single management eliminate the existing problems arising out of the conflicting interests of rival ports. Indeed, under East African conditions, the suspicion of unfair discrimination would probably only be removed by the transfer of the offices of the combined General Manager to some neutral territory! The problems of railway co-ordination are being solved without amalgamation between other competing countries not possessing the advantage of an overruling Secretary of State.

161. For reasons which will be evident from other parts of this report, a complete amalgamation would greatly help the solution of the road-rail question in Tanganyika, but only because of the implied financial assistance from the Kenya and Uganda Railways towards an adjustment of rates on the Tanganyika Railways. In all the circumstances, it seems that Tanganyika must resign itself to looking after the finances of its own railway, and face the possibility that, partly through the setback due to the loss of traffic from the Belgian Congo, the necessity for the minimum rate adjustments to conform with the Kenya and Uganda Railways may still further defer the date when the railway will fully pay its way.

[...]
H. O. MANCE.

9th December, 1936.
APPENDIX 1

Extract from the Report of Sir Felix Pole on Transport Conditions in Northern Ireland

The following items of working expenses are suggested as those which vary with the volume of traffic:–

**Railway Companies:**

*Abstract B:*

Maintenance and Renewal of Rolling Stock, including Containers (excluding Superintendence).

*Abstract C:*

Wages Connected with the Running of Locomotives, Diesel Cars and Electric Motors.
- Fuel, including Petrol.
- Electric Current.
- Lubricants.
- Water.
- Other Stores.
- Miscellaneous.

*Abstract D:*

Guards’ Wages and Clothing.
Cleansing, Lubricating and Lighting of Vehicles.

**Road Transport Board:**

Maintenance and Renewal of Road Vehicles (excluding Superintendence).
Omnibus, etc., Tyres.
Maintenance and Renewal of Horses (excluding Superintendence).
Maintenance and Renewal of Sheets for Road Vehicles (excluding Superintendence).
- Wages and Clothing of Drivers, Conductors, etc.
- Depot Overhead Expenses (Engineering) – (Wages of Foremen, Watchmen and Other Miscellaneous Engineering Staff, Lighting, Heating, Cleansing and Maintenance of Equipment).
- Petrol and Other Fuel.
- Cleansing, Lubricating and Inspecting Vehicles and Supplies for Vehicles.
- Licensed Vehicle Duty and Licence Fees.
APPENDIX 2

Theoretical Analysis of Out-of-pocket Costs of Working by Alternative Rail-road and Road Routes; Rates Chargeable With Present Rate Structure, and the Tolls Which Might be Payable to the Railway

See Paragraphs 27–29

Division of Function.

It is assumed that the average out-of-pocket costs to the community are 3 cents per ton-mile for railway operation and as low as 18 cents per ton-mile for road transport; and that a fair average commercial charge for road transport is 36 cents per ton-mile. The exact figures are not important here.

If the starting point is on the railway, and
’d’ is the rail distance to the nearest station to destination:
’a’ is the delivery distance from that station by road;
‘c’ is the throughout distance by road from starting point to destination.

Then, ignoring cost of transhipment, for simplicity and in view of its comparative unimportance for long hauls, it will theoretically be cheaper for the community to use the combined rail and road route so long as 3d + 18a is less than 18c, i.e., so long as ‘d’ is less than 6 (c – a).

If for example ‘d’ is 200 miles and ‘a’ is as much as 400 miles, the out-of-pocket cost will be less to carry goods by the rail and road route so long as ‘c’ is over 433 miles. This shows that most of the traffic by slantwise roads or circuitous routes likely to come into question – except for short distances – should pass by the rail route on the grounds of cost to the community.

Taking a more normal case of a slantwise road at about 45° to the railway, i.e. ‘d’ = 200 miles, ‘a’ = 200 miles, and ‘c’ = 280 miles, the out-of-pocket costs would be 3x200+18x200=4,200 cents for the rail route, and 18x280=5,040 cents for the road route.

Monopoly and Competitive Rates by Alternative Routes.

In this case the present railway rates (for 200 miles) are:

<table>
<thead>
<tr>
<th>Rate</th>
<th>Made Up of</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Out-of-pocket Cost</td>
<td>Plus Toll</td>
</tr>
<tr>
<td></td>
<td>Sh. cts.</td>
<td>Sh. cts.</td>
</tr>
<tr>
<td>Class 1</td>
<td>273 28</td>
<td>6 00</td>
</tr>
<tr>
<td>Class 2</td>
<td>197 12</td>
<td>6 00</td>
</tr>
</tbody>
</table>
A combined monopoly, desirous of earning the same contribution towards fixed charges by either route, would fix rates as follows:—

**Railway Route.**

<table>
<thead>
<tr>
<th></th>
<th>Railway Contribution to Fixed Charges = Toll (Sh. cts.)</th>
<th>Road Contribution to Taxes, Overheads and Profits (Sh. cts.)</th>
<th>Out-of-pocket Costs (Sh. cts.)</th>
<th>Total Rate (Sh. cts.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>267 28</td>
<td>+ 18 x 200</td>
<td>+ 3 x 200 + 18 x 200</td>
<td>=345 28</td>
</tr>
<tr>
<td>Class 2</td>
<td>191 12</td>
<td>+ 18 x 200</td>
<td>+ 3 x 200 + 18 x 200</td>
<td>=269 12</td>
</tr>
</tbody>
</table>

The total contribution to non-variable charges amounts to 303.28 for Class 1 and 227.12 for Class 2.

**Road Route.**

The out-of-pocket cost by the road route is 18x280=50.40, so that the corresponding rate charged by a combined monopoly would be: Class 1, 303.28+50.40=353.68; and Class 2, 227.12+50.40= 277.52. The difference between the rates by the two routes equals the difference in the out-of-pocket cost of working.

In practice, road transport, being under separate ownership to the railways, may be taken to fix its charges separately at the assumed fair commercial rate of 36 cents per ton-mile. This will make the total rate by the rail-road route as before 345.28 for Class 1 and 269.12 for Class 2.

If there is no railway monopoly the competitive rate by the road route will be 280 x 36 = 100.80.

If, however, there is a railway monopoly and the road route has to pay the full theoretical toll to the railway, less say 5 cents per ton-mile paid as taxes, then the rates by the road route would become:—

\[
\begin{align*}
\text{Class 1} & \quad 100.80 + (267.28 - 280 \times .05) = 354.08 \\
\text{Class 2} & \quad 100.80 + (191.12 - 280 \times .05) = 277.92
\end{align*}
\]

For the distances and rates assumed this happens to approximate to the rates which would be charged by a combined monopoly.

**Situation if Present High Class Railway Rates Reduced.**

Supposing, however, that the highest railway rate is reduced to 50 cents per ton-mile, both the above rates for the rail-road route become 50 x 200 + 36 x 200 = 172.00. This will evidently reduce the incentive to slantwise road traffic and facilitate its control. Moreover, if such control involves the payment of toll to
the railway, this will be a more tolerable figure and will be simpler to arrange, seeing that the theoretical toll for the first four classes will be at the same rate per ton-mile for the first 250 miles. Moreover, the length of the circuitous route which it will pay competitive road transport to convey first and second class traffic as compared with 200 miles of railway would be reduced from 273.28/.36 = 759 and 197.12/.36 = 548 miles respectively to 100.00/.36 = 278 miles, thus greatly reducing the mileage of roads needing control as being competitive with the railways.

The above analysis is to illustrate a principle. The proposed Transport Commission would act in the light of practical conditions both as regards licensing alternative road services and in cases where it may be found practicable to arrange for tolls as part of a licensing arrangement, but any scheme is more likely to work if theoretical considerations have not been lost sight of.

APPENDIX 3

Motor Vehicles in 1935

<table>
<thead>
<tr>
<th>Motor Vehicles</th>
<th>Kenya</th>
<th>Tanganyika</th>
<th>Uganda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lorries:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Ton</td>
<td>248</td>
<td>33</td>
<td>–</td>
</tr>
<tr>
<td>1 1/2 Tons</td>
<td>975</td>
<td>641</td>
<td>400</td>
</tr>
<tr>
<td>2 Tons</td>
<td>345</td>
<td>507</td>
<td>1,466</td>
</tr>
<tr>
<td>2 1/2 Tons</td>
<td>80</td>
<td>31</td>
<td>71</td>
</tr>
<tr>
<td>3 Tons and Over</td>
<td>47</td>
<td>10</td>
<td>33</td>
</tr>
<tr>
<td>Government and K.U.R.</td>
<td>† 129</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Total Lorries</td>
<td>1,695</td>
<td>1,351</td>
<td>2,033</td>
</tr>
<tr>
<td>Omnibuses:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Ton</td>
<td>17</td>
<td>7</td>
<td>–</td>
</tr>
<tr>
<td>1 1/2 Tons</td>
<td>21</td>
<td>117</td>
<td>75</td>
</tr>
<tr>
<td>2 Tons</td>
<td>26</td>
<td>142</td>
<td>40</td>
</tr>
<tr>
<td>2 1/2 Tons</td>
<td>2</td>
<td>16</td>
<td>112</td>
</tr>
<tr>
<td>3 Tons or More</td>
<td>22‡</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Government and K.U.R.</td>
<td>–</td>
<td>–</td>
<td>12</td>
</tr>
<tr>
<td>Total Omnibuses</td>
<td>88</td>
<td>283</td>
<td>249</td>
</tr>
<tr>
<td>Private Cars</td>
<td>7,554</td>
<td>2,093</td>
<td>1,708</td>
</tr>
<tr>
<td>Taxis</td>
<td>171</td>
<td>111</td>
<td>4</td>
</tr>
</tbody>
</table>

* Weight estimated from gross loads and number of passengers.
† 173 included in preceding figures.
‡ Kenya Bus Company.
THE RAILWAY SYSTEMS OF WEST AFRICA.

By Captain H.O. Mance, D.S.O., R.E.

On Wednesday, 22nd January, 1913, at 3 p.m.

[...]
advanced in this lecture are personal views and bear no official authority. It is not claimed that they are original. Some of them were first advanced years ago. [...] 

OBJECTS OF RAILWAY CONSTRUCTION IN WEST AFRICA.

Effective Occupation. – One of the first objects of railway construction in West Africa, or for the matter of that in any of our more recently acquired tropical dependencies, is to attain effective occupation. The Uganda Railway was built primarily to stop the slave trade. The Soudan Railway was undertaken to aid in the reconquest of that country. The Senegal-Niger railway was planned to secure for France the basin of the Upper Niger. This method of occupation is far more effective than military conquest. It possesses, however, the disadvantage that the information available is not usually sufficient to enable the railway to be located for the best future welfare of the country. The consideration of effective occupation is therefore in itself a temporary one.

Strategic. – After the pacification of a colony there may remain strategic reasons for the construction of railways, which would play an important part in the event of a Mahommedan rising emanating from one of the uncontrolled regions of North Central Africa. Any general scheme of railway development based on economic grounds will meet such requirements; and these will at most only influence the order in which the component projects are carried out. 

As regards international hostilities, it is not likely that problematical strategical considerations will be allowed to influence a railway policy upon which success in international commercial rivalry may depend.

Development of External Commerce. – A little reflection will show that the development of external commerce should be the paramount object of railway construction, whether looked at from the point of view of affording the inhabitants a fruitful field for energies released from less productive occupations by the advent of ‘Pax Britannica’ or its Continental equivalent; or from the point of view of European trading firms, and manufacturers of goods for native markets who are dependent on cheap transport for the extension of trade; or from the standpoint of the administration, and, above all, the Treasury, out of whose clutches it is the desire of every self-respecting colony to extricate itself by dispensing with a grant-in-aid. West Africa has enormous resources, of which, in many cases, a microscopic portion supplies the local requirements. The prosperity of these countries prior to European occupation varied with the extent of their trade with neighbouring countries, carried on, as it was, under dangers and difficulties. Further increase in prosperity can chiefly be obtained by widening
the markets for the products of the country, and improving the efficiency of pro-
duction, both of which objects are effected by extending the means of transport.

ADMINISTRATION. – Administrative reasons, such as intercommunica-
tion between the different arteries serving outlying portions of a dependency,
or the necessity for access to healthy stations, are permanent reasons, the relative
importance of which, compared with economic development, will vary in differ-
ent localities, and with the state of progress which has been reached.

LOCAL. – Finally, it is possible that railways may be specially built for such
local purposes as to transport labourers and food from populous areas to mining
centres, to connect the more fruitful food-producing countries with areas liable
to famine, and to distribute local coal in competition with imported supplies.
Internal native trade is more likely to be modified by than to influence railway
construction.

Thus we are led to approach the problem of railway location primarily with
the object of fostering external commerce while giving due regard to administra-
tive facilities.

GENERAL FACTORS WHICH GOVERN LOCATION OF
RAILWAYS IN WEST AFRICA.

PORTS. – The first practical consideration which at once presents itself is the
question of ports. West Africa affords a striking example of what can be done in
the way of trade on a surf-bound coast without ports, but it is easily seen that
only the more lucrative forms of trade can survive the inconveniences and extra
cost, both direct and indirect, involved by the primitive method of conveying
cargo between the shore and ocean steamers by surf boats, which in bad weather
may have to suspend operations. It will, therefore, pay to divert railways con-
siderable distances from their shortest route to the coast to / obtain the greater
capacity, reliability, and cheapness afforded to trade by good, or better, ports.

EARLY PROFIT ON WORKING. – No administration is likely to construct a
railway without ensuring, as far as possible, that the immediate return will make
the undertaking pay its way from the commencement. In West Africa, with its
ubiquitous natural resources and possibilities, the limiting factor in the develop-
ment which can be brought about by improved communications is the density
of population, and it will therefore usually pay quickest to build railways in the
more populous districts. The effects of long periods of slave raiding have, how-
ever, altered the distribution of population in a striking degree, so that at present,
population density cannot be regarded as a reliable index to the natural resources
of the various districts to the extent that would be expected in a more settled
country; and in the absence of special influences, it will take several generations to
bring these factors into close relation. It must also be borne in mind when study-
ing population charts, that areas suitable for growing native food-stuffs of low commercial value may support a large population, independently of transport facilities, for the lack of which a district richer in sylvan and mineral wealth, but less suited for producing food staples, may remain comparatively uninhabited.

A portion of a population density chart of West Africa, compiled from the latest available data, has been reproduced on pages 14 and 15 (not included). The data cannot be regarded as final, and the distribution shown will doubtless be considerably modified in the light of further knowledge of the country. Such as they are, however, these figures of population density are well worth study by those interested in West African problems. The depopulated area due to slave-raiding will be seen extending from east to west, between the Hausa States and the coast provinces of Nigeria, and still further to the west in the Northern Territories of the Gold Coast and the Ivory Coast. The scale on the chart shows the density, expressed in the number of inhabitants per square kilometre. This multiplied by two-and-a-half will give, approximately, the number per square mile. The densest areas shown are those with over 100 per square mile, but there are some portions of Southern Nigeria which are far more thickly populated. In the district of Ikot Ekpene the population is estimated at 430 per square mile. It will be noted that Nigeria is by far the most densely populated part of West Africa.

Natural Resources. – Coupled, therefore, with the knowledge of the present distribution of population, it is most important to take stock of potential riches, sylvan, agricultural, and mineral, of the country it is proposed to develop. Perhaps it is for this purpose that our Continental neighbours in West Africa usually send a scientific mission to report on the districts it is contemplated developing by railways.

So far as we have got, our general scheme of railway development will consist of one or more railway systems starting from the best ports and disposed to drain, in the most effective manner, the areas endowed with the greatest resources, whether developed or potential, precedence being given to the more densely populated areas in view of the importance of each portion of the scheme paying its way as it is constructed.

Competition. – How far this latter consideration may be allowed to weigh, will depend a good deal on the point next to be considered, namely, the possibility of competition with existing or future railway systems or water transport. This is not so important in cases where the opposition railway is controlled by the same administration, but where, for example, the railways of two adjoining European Powers are likely to compete for the trade of an important district, everything may have to give way to obtain the cheapest outlet for through traffic. It is always possible to serve rich non-competitive areas, lying off the direct route, by branch lines.

The products of West Africa have, moreover, to compete in European markets with similar commodities from other origins, and the future prosperity of a
colony may lie in commodities, the exploitation of which depends on the cheapness of transport. It may be advanced that a longer line through a richer country can profitably quote lower rates than a more direct line, which cannot reckon on a nucleus of lucrative intermediate traffic; but in the long run, under the stress of competition for a large volume of traffic, assuming equal facilities, rates as a whole will bear relation to the bed rock of working expenses, so that it may well pay to build an unproductive section as part of a general scheme for the best ultimate good of the country.

Physical Configuration. – The same considerations which justify a comparatively unremunerative section may make it worth while undertaking a route which is more costly to construct by reason of physical difficulties, in order to attain lower ultimate expenses. The additional expenditure may be devoted to obtaining a shorter line through more difficult country, or to reducing the ruling grade. It is hardly necessary to point out that the added charge on traffic due to interest on increased capital expenditure remains constant, and the extra cost per ton mile therefore becomes less as the traffic increases, so that at a certain stage of development this extra cost is more than covered by the reduction of working expenses. A happy mean in this respect has been attained in Northern Nigeria on the Baro-Kano Railway. Here expenditure was not stinted where necessary to obtain the best possible grade, but in other respects a cheap line was constructed capable of being improved as traffic increases. This type of line is destined to play an important part in the development of West Africa.

As a general rule, however, it is evident that physical configuration exercises an important influence on the situation of railways.

Political Frontiers. – The weightiest economic considerations may have to give place to the fortuitous disposition of international frontiers. The French had to abandon their original scheme for the line of penetration in French Guinea, as it was found that the most favourable route lay partly within the hinterland allotted to Great Britain. The existence of protective fiscal tariffs may artificially influence the lines of railway development. The case of Sierra Leone and French Guinea may be cited and will be referred to again.

Cross County Lines. – As regards the lines constructed chiefly for administrative purposes, these will be in the nature of cross lines, and will act as feeders to the coast trunk lines. Unless likely to form part of a cross trunk line, deviations from the shortest route will only affect the local area served. It must be remembered when scheming a railway system, that the construction of a connecting link between two systems almost invariably introduces the factor of competition by alternative routes.
EXISTING AND PROPOSED FRENCH RAILWAYS.

Existing French Railways. – I will now briefly review what has been done in the past. Precedence must be given to the French, who had the honour of starting to build the first railway in West Africa, 15 years ahead of any other nation, and who lead to-day with their West African railway policy.

The port of Dakar has wharves along which ocean steamers can berth. It is becoming an important coaling station for South American lines of steamers, and with the adjoining port of Rufisque, is the present outlet of the French Western Soudan.

The Dakar – St. Louis line, 165 miles long, commenced in 1882, completed in 1885, taps the whole of the water-borne trade of the Senegal River, which has no practicable outlet to the ocean by reason of its bad bar.

The Kayes – Bamako – Koulikoro Railway, 346 miles long, originally proposed by Faidherbe in 1863, connects the head of navigation on the Senegal River with the head of the longest navigable reach on the Niger. It was commenced in 1881, and, at the cost of many lives, and after many vicissitudes, was finally completed in 1904, securing to the French the basin of the Upper Niger.

It was decided as early as 1878, when a commission was appointed in France to report on the railway development of French West Africa, that the two above railways should be eventually linked together, and the correctness of this policy has been borne out by the fact that the navigation of the Senegal River to Kayes, though admitting boats with 1,000 tons cargo for a short period of high water, is found to be too uncertain to be relied on as the outlet of the Upper Niger country. A railway is therefore being constructed to link together Thiès and Kayes, and thus cut out the Senegal. This line, which will be about 425 miles long, is being constructed from both ends, and has been completed all but about 180 miles.

A line from Konakri, a comparatively good port, with a wharf for ocean steamers, was started in 1900, and completed to Karoussa (367 miles) in 1910. It is now being extended a further 40 miles to Kankan, whose importance as a commercial centre may be deduced from the fact that 14 European firms were installed there while yet the railway was hundreds of miles away. Both the Niger from Karoussa (250 miles away) and the Milo from Kankan are navigable for small steamboats to Bamako during the high-river months, and by large canoes all the year round. Feeder roads have been constructed from the railway in the most likely directions for future branch lines.

On the Ivory Coast a line 195 miles long has been constructed from Abidjan through the forest belt to Bouaké. Progress was delayed by the native rising early in 1910, when the line was attacked and damaged in places. There is a jetty through the surf at Grand Bassam, and the facilities, which appear to have been very unsatisfactory, have recently been improved. An attempt to form a seaport
at Abidjan by joining the lagoon with the ocean failed and had to be abandoned. As a result the railway terminates on a lagoon, over 20 miles from Grand Bassam, its sea-port. One of the suggestions to get over the difficulty is to extend the railway from Abidjan across the lagoon to Port Bouet, and build one or two jetties at the latter place. Another scheme is to improve Grand Bassam and link it by rail with Abidjan via Bingerville.

In Dahomey a railway 162 miles long exists from Kotonu to Savé, with a branch 20 miles along the coast to Segboroué. A tramway of the same gauge runs from Porto Novo to Sakete, 25 miles long, and now being extended a further 25 miles. Owing to the lack of a harbour at Kotonu, where there is only an iron jetty projecting through the surf, a large proportion of the trade of Porto Novo is sent via the coastal lagoons to Lagos for shipment.

French Programme of Main Line Construction. – The Government appears to have organized the collection of information bearing on the extension of railways, and in May, 1911, the Governor-General of French West Africa proceeded on a tour embracing all the colonies under his jurisdiction. On his return a general scheme of railway and harbour development, estimated to cost over 19 millions sterling, in addition to the funds already voted, was promulgated, to commence which a loan of 150 million francs, or six millions sterling, is being raised. Of this amount £240,000 is allocated to improving the port of Dakar, £120,000 to the port of Konakri, and £40,000 for the survey of and preliminary work on a port on the Ivory Coast. The attached map shows generally the proposed scheme of railways, which is on the lines of one foreshadowed in 1906. Starting from Dakar a main artery will extend via Thiès, Kayes, Bamako, Buguni, Boromo, Wagadugu, Fada N’Gurma, Paraku to Kotonu, a distance of about 2,000 miles. From this main artery two lines will extend to the coast, one from Buguni via Kankan and Kurussa to Konakri, the other from Boromo via Bouaké to Abidjan. Two branches will be built to the Niger. The first from Paraku to Gaya, the head of what may be termed the middle navigable section of the Niger, and the second from Wagadugu to Ansongo at the foot of the longest navigable section of the Niger. It may be mentioned that, in the event of the suggested Trans-African Railway being constructed, to link together Algeria with the Congo Railway system via Lake Chad, a branch would be made either from Selet or In Gessan to Ansongo to connect with the French West African system. Kankan will be connected with Dimbokro on the Ivory Coast Railway by a direct line through Beyla and Daloa, and finally there will be a cross line between the Thiès-Kayes and the French Guinea Railway. The portions of this system, which it is intended to carry out by 1918, out of the forthcoming loan, are shown in Appendix 1. The Governor-General, however, will be able to divert expenditure from one line to another, so that it may be possible, for example, for the line to be continued on from Paraku to the Niger, within the next few
years. This scheme is only intended to provide for the trunk lines of the future railway system of French West Africa. Branch lines will be built to develop special districts as the need arises.

It will be noted that the existing centres of densest population are tapped as far as possible without deflecting the trunk lines from the shortest routes to the interior.

**Consideration of Thiès – Kayes Line.** – The *Thiès – Kayes Railway* was deflected to the southward to tap the rich basin of the Gambia instead of the almost desert hinterland, and to save as much as possible of the trade from being diverted to British channels. A proposal, made in 1907, to go direct from Tamba Counda to Talary, thus shortening the rail journey from the interior by 42 miles, was overruled on the grounds of costing £200,000 more. Possibly the more immediate advantage of the Kayes-Amidé section which has just been commenced, influenced the decision. I cannot help thinking that the future will prove that the more direct route would have been best, with a branch 25 miles long from Kayes to Amidé if necessary. A scheme has been suggested to build a branch line, 13 miles long, from Guinguineo to Kaolak on the Saloum River, which is / navigable at all times, thereby saving some 90 miles as compared with Dakar. It must be remembered, however, that the Gambia River is already navigable for vessels of 13 ft. draft all the year round to McCarthy’s Island, 153 miles from Bathurst, and the depth is now being improved to 15 ft. Nianimaru, some 30 miles below McCarthy’s Island, is stated to be accessible at all times by fully-loaded ocean vessels drawing about 20 feet. It is, therefore, not unreasonable to suppose that a short branch line to McCarthy’s Island, or, better still, to the vicinity of Nianimaru, might make the Gambia the future commercial outlet of French Western Soudan. The saving in the rail journey to McCarthy’s Island as compared with Dakar, would appear to be about 180 miles.

Comparing the Dakar, McCarthy’s Island, and Konakri routes: from Bamako to Dakar via the Thiès – Kayes route will be 810 miles; from Bamako to Konakri via the Niger to Karoussa is 620 miles; or by rail via Buguni will be about 660 miles. The rail journey from Bamako to McCarthy’s Island will be 630 miles, and, had the short cut to Talary been adopted, might have been 590 miles.

Liberia. – In Liberia it is reported that a concession has been granted to a German firm to build a railway from Monrovia to the frontier of French Guinea.

**German Railways.**

Togoland. – Turning to the German colonies, the following lines exist in Togoland: A coast line 28 miles long from Lome to Anecho, completed in 1905; a line from Lome to Agome-Palime 77 miles long, opened in 1907, and a line from Lome to Atakpame, 102 miles long, opened in 1911. A local line north-
wards from Anecho, or eastwards from Tsewie, is projected to develop the rich oil district north of Anecho. The Agome-Palime line will possibly be extended in the future towards Kpandu. It is proposed, when funds permit, to extend the Atakpame line to the interior to serve Sokode and Bassari, and eventually towards Sansanne Mangu to Tchipowa. Unfortunately Togo possesses no good port, the facilities at Lome consisting of an iron pier, as at Kotonu. This pier was badly damaged by the sea in 1911, but is now repaired.

Cameroons. – In the Cameroons the issues are larger, and concern us perhaps more directly. Two railways are being built. The northern line, 100 miles long, from Duala to Ngonsamba, on the lower slopes of the Manenguba mountains, was opened in 1911. The centre line from Duala through Edea is being constructed to Mbalmajo on the river Njong near Widimenge, a distance of 178 miles. Duala is a port comparable with Calabar, and capable of considerable improvement at a slight cost.

There is also a narrow gauge private tramway from Victoria to Soppo, 27 miles long, serving the headquarters of the administration at Buea.

A special mission is now investigating the country with a view to deciding on the best direction for the extension of the northern line. The alternatives appear to be the route approximately shown on the map, and a line more to the east via Joko, Tibati, and Ngaundere. It is proposed to carry this line eventually to Garua, and even to Kusseri, as the Germans seem convinced that the Benue River will not suffice as the outlet for their northern provinces. Captain Mercier, in an article published in November, 1911, in L’Afrique Française, arrived at an opposite conclusion, and recommended connecting the Benue and the Logone rivers by a railway to serve the French Chad and Shari territory. It is perhaps worth going into the matter for ourselves.

The Benue is navigable up to Yola for vessels of 200 tons cargo capacity for three months in the year, and during this period the conveyance of traffic to Garua can be guaranteed by lessening the amount of cargo or using slightly smaller vessels from Yola onwards. Assuming that the Benue fleet is based on Lokoja, to which point boats containing 1,000 tons of cargo have access during the Benue flood season, each vessel can only be counted on to make four return journeys to Yola in the season. Now the whole of the Government fleet, excluding the smaller vessels, has a cargo capacity of about 1,800 tons, representing some 600 tons weight of paying cargo, so that in the three months the Government fleet could at most, if fully employed, bring down 2,400 tons of produce a year, or if the faster vessels made five trips, say, 2,700 tons weight. I doubt if the whole of the existing fleets on the Niger could bring down 7,000 tons a year from Yola and beyond; but nothing like this amount of shipping will be available, as it is obviously out of the question to have special vessels for the Benue traffic only – laying them up for most of the year – and it will only be possible
to withdraw vessels from the Niger service in the case of river carriers who command sufficient business to justify chartering vessels carrying 1,000 tons, known as ‘branch boats,’ for the Niger, during high-water, thus releasing the sternwheelers for the Benue. Under the circumstances, apart from the disadvantage of the short period the river is open every year, the Benue could not cope with the tonnage which may reasonably be expected in the future from the French and German sources, in addition to that originating in Northern Nigeria. Moreover, the distance by river from Garua to Forcados is about 870 miles, and a rate of £6 per ton was charged to the French for this distance. A railway from Garua to Duala might possibly not exceed 500 miles, so that an average rate of 3d. per ton mile would successfully compete with the river. Under the circumstances any road or railway between the Logone and Benue would feed a line to Duala in preference to the River Benue. The railway would also develop the country passed through, and greatly facilitate the administration of the Cameroons. Therefore it will be built and will tap Yola and Eastern Bornu in the absence of a competing line.

The centre line from Duala to Mbalmajo was chosen to develop the central part of the Cameroons in preference to a line from Kribi to Ebolowa, advocated by the merchants at Kribi. The principal objection to Kribi appears to be that it will never be a good port. From Mbalmajo the Njong is navigable all the year to Abong Mbang, only 30 miles from the Dume River, which at high water is navigable downwards for 125 miles to within about 100 miles of Nola on the navigable Sanga. An extension of the centre line via Gamane and Kunde to the navigable Logone, or a branch from the northern line to the Logone, especially if the eastern route is chosen, might capture the trade of French Shari territory more effectively than could be done by a line from the Logone to Garua.

An alternative scheme to the Kribi – Ebolowa line is a railway from Kampo eastwards to compete with the suggested French line from Libreville to Wesso.

SIERRA LEONE AND THE GOLD COAST.

Sierra Leone. – Turning now to the British colonies, we have in Sierra Leone a splendid harbour at Freetown, which will probably some day be provided with wharves for berthing ocean steamers, and a trunk line of 2 ft. 6 in. gauge from Freetown to Pendembu, 228 miles. There is a branch line from Boia junction to Roruks, which is being extended across the Rokelle River towards Makene, a total distance of about 90 miles, about half of which has been completed. Looking at the map, the main line would appear to tap a portion of French Guinea lying east of Sierra Leone and north of Liberia, but a heavy duty is placed on imports into French Guinea through a foreign country, with a view to the imports, and consequently the exports, being diverted via Konakri. This is only possible in the case of valuable commodities like rubber, which can stand the rate via the longer
route. Low grade produce from the hinterland may have to go by the cheapest route or not at all. On the other hand the Konakri railway will continue to divert the trade of the northern provinces until the extension of the northern branch of the Sierra Leone Railway renders effective competition possible.

There is a mountain line six miles long connecting Freetown with the Hill Station, some 900 feet above sea level.

Feeder roads are being constructed to open up the country traversed by the railway. The Sherbro district is well served by several rivers, and the harbour at Bonthe is available for vessels of a draught of 18 feet.

**Gold Coast.** – In the Gold Coast a 3 ft. 6 in. gauge line, 170 miles long, from Sekondi to Coomassi, has been in operation since 1903, and a branch line 20 miles long, from Tarquah to Prestea and Broomassie, was opened in 1911. Sekondi is the best port on the Gold Coast at the present time, being accessible by tugs and lighters instead of surf boats only, as elsewhere, but ocean boats have to discharge and take on cargo in the open roads. This port is now being improved. If it is possible to secure a better harbour with smooth water for ocean boats it would not only be better, but cheaper in the long run, for the colony to make great sacrifices to acquire such a port. A decision on this point must precede the framing of any comprehensive scheme of railways.

Attempts have been made to improve the landing facilities at Accra, but with qualified success, and a railway has been built for about 40 miles from Accra to Mangoase, and though only opened in 1911, is already paying well with cocoa traffic. The problem now is in which direction to extend this latter line, whether to Coomassi, in which case competition with the Sekondi line will at once be introduced, or more or less parallel to the coast to the Sekondi line, in which case most of the traffic will go to Sekondi, or northwards to open up new country. It appears that extensions of either line northwards beyond a certain point will have to traverse a sparsely populated belt, but in the long run a trunk line to the north will probably have to be constructed in view of French and German competitive lines, and if so it will be better to go through first and secure the traffic. The policy up to the present has been to construct trunk roads north of Coomassi, but there is all the difference in the world between trunk lines of roads and a trunk line of railway with feeder lines of roads.

The question of utilizing the Volta River is being investigated, but at the best this could only be regarded as a temporary main line of communication.

**Nigeria.**

**Existing Railways.** – There remains to be considered Nigeria, our most important possession on the West Coast. We find at present a 3 ft. 6 in. line from Lagos, through the large centres of Abeokuta, Ibadan, Oshogbo, and Ilorin to Jebba (307 miles), across the Niger, partly by a bridge and partly by temporary
train ferry, and via Zungeru – the administrative capital of Northern Nigeria – to Minna, where it joins a line from Baro, on the Niger, to Kano, the famous market of the Hausa States. The distance from Lagos to Kano is 712 miles, and from Baro to Minna 111, and Kano 356 miles. A branch 90 miles long has been constructed from Zaria to the Rahamma River towards the principal tinfields, and it is decided to extend this line to the top of the Bauchi plateau in the direction of Bukeru, both to serve the tinfields, and to give access to the healthier uplands. Unfortunately this branch line has been built in a 2 ft. 6 in. gauge, thus saddling the country with what will be an ever-increasing disadvantage unless a decision is faced to alter this line to the standard gauge of Nigeria and banish the 2 ft. 6 in. material out of the country. The French have had one or two narrow escapes in the past of introducing mixed gauges, but have luckily come through without, I believe, a single instance in West Africa.

In Nigeria we have ample scope for building ‘railways in the air.’ Great controversies have taken place in the choice of ports, Warri having been suggested as an alternative to Lagos as the port of the Western line. It has, however, been decided to plump for Lagos, and heavy works are being undertaken with a view to making the bar possible for ocean steamers, which at present transfer passengers to surf boats, and thence to ‘branch boats’ in the open roadstead, and discharge their cargo at Forcados into branch boats for return to Lagos. Forcados, the ocean port for the Niger traffic, is a good harbour, accessible over a 19 ft. bar. From this port two independent lines of sternwheelers serve the Niger and Benue. Baro, the starting point of the Northern Nigerian Railway, has always been accessible during two-and-a-half months by steamers drawing 11 feet and conveying 1,000 tons of cargo; for nine-and-a-half months by sternwheelers drawing four feet and conveying 200 tons of cargo; and all the year round by launches drawing two feet. It will be seen that even without artificial improvements to navigation, the Niger will be a formidable competitor of the Lagos Railway.

**Extensions in Southern Nigeria.** – The dense population of Southern Nigeria will no doubt justify the construction of local lines not forming part of the main arteries of communication with the interior. To the east of the Niger a line some 60 miles long has been surveyed to connect Onitsha with the Udi coalfields, which are believed to be of considerable value. This line, if built, must obviously also connect with other future lines east of the Niger. A future line might run from Warri via Benin, with cross connections between the western line and Onitsha, Lokoja, or Baro. Nor is it likely that the densest population of all round Ikot Ekpene will be left undeveloped; and whether this area will be best served by a line from a secondary coast port such as Bonny or Opobo, or by a line from the head of the permanent Cross River navigation at Itu, will be an interesting point.
The coastal regions will be served by improving the navigation of the network of lagoons.

**Eastern Trunk Line.** – It appears to have been generally accepted that a second trunk line serving the eastern portion of Nigeria should start from Calabar, and to have been assumed that this line would also serve Kano. A branch of the eastern trunk line directed on Kano would be the shortest route to the coast, but would encounter an almost impracticable escarpment running east and west, north of the Benue. It would, however, serve the tinfields, and if in the future such a line is required, a rack section may solve the difficulty as in the case of the Delagoa Bay line to the Transvaal. The eastern port is two days further by sea, so that the Lagos line will always hold its own for passenger traffic. There are, however, already two competing lines from Kano, and the construction of a third may well be deferred till the Sokoto and Yola-Bornu areas have been provided for. Both these areas are likely to be threatened by foreign competitive railways, a fact which renders it necessary to make our trunk lines as direct as possible and ahead of competing lines.

As regards Bornu, it has already been shown that the Benue and Niger cannot compete with a direct railway from the coast to our eastern frontier, and the first consideration in selecting a trunk line to serve competitive areas such as Maidugari and Yola, is that the cost of transport to the coast should not be greater than by the German line from Garua.

Unfortunately the most direct line from Calabar, the inevitable port of Eastern Nigeria, would start by traversing a sparsely populated region, and the Shebshi mountains south-west of Yola might necessitate a detour or lead to Yola being served by a branch line. In the face of more attractive projects in other directions, and in the absence of reliable information regarding the country, there appears to be no immediate prospect of such a trunk line being constructed, but it is hoped that meanwhile local schemes will not be entered on which might clash with the requirements of the future.

**Cross Country Line in Northern Nigeria.** – A cross country line useful for administrative purposes might be made from the Bauchi branch line some 40 miles from Zaria eastwards between the Ninghi Hills and the northern spurs of the Bauchi Highlands, via Nafada, the head of the navigable Gongola (a tributary of the Benue), to join the eastern trunk line, and it would probably pay to construct this line to develop Bornu until such time as the value of the traffic and the prospects of competition justify the eastern trunk line being undertaken.

**Western Trunk Line.** – Turning to the west of Nigeria; Jebba, the point where the Lagos railway crosses the Niger, is the head of the navigable Lower Niger, being accessible by vessels drawing five feet during six months of the year, though for two months the draught available is under two feet. Above Jebba for about 120 miles up to Sekachi, navigation is impeded by a series of rapids quite
impracticable for steam vessels and only passable by large canoes with difficulty during the high water. There is no possibility of improving this section of the river. Above Sekachi the Niger is again navigable up to Gaya in French territory, and to lesser extent up to Kompa, where another series of rapids commences and extends with intervals up to Ansongo, whence the river is again navigable for sternwheelers for about 900 miles to Koulikoro.

The Sokoto River or Gulbin Kebbi joins the Niger opposite Gomba, and small canoes can reach the important market of Jega, on one of its branches, all the year round. This river is, however, unsuitable for a main artery of trade, and is used chiefly for local traffic.

The navigable section of the Niger from Sekachi to Gaya intersects every trade route from Sokoto to the coast, and the first railway to reach this section and start a service of river steamers will have the best chance of securing the Sokoto trade.

As stated before, it is proposed to extend the French Dahomey railway, which at present terminates at Savé, to Paraku and on to Jugu, and with sufficient inducement the line could reach Gaya, the proposed terminus on the Niger, 300 miles from Savé, in 1916.

The population of Sokoto Province is estimated as 1,300,000, and is densest in the regions bounding the Sokoto River and its tributaries.

Another factor in this particular problem is the possible advisability of building a line from, say, the bend of the Lagos Railway, north of Abeokuta to about Ilesha, to prevent trade being diverted to the French Railway. A possible solution of the Sokoto problem would then be to extend this line through Borgu, across the Niger east of Gomba, and so continue to Jega and Sokoto. This would be the shortest route to the coast, but would traverse a practically uninhabited region in central Borgu, whose sparse population is found either along the frontier in the vicinity of the trade route from Sokoto, or along the banks of the Niger. It would involve an expensive bridge over the Niger in the middle of a navigable section, and several miles of bank over swamps north of the Niger.

As regards possible future trade from Borgu, this would probably be retained by a line to Okuta only.

Another solution would be to build a line from Jebba east of the Niger to Sekachi, and thence to Jega and Sokoto. This route to the coast would be longer, but sufficiently short to compete with any likely alternative route. The combined length of line, Abeokuta to Ilesha, and Jebba to Sokoto, would be about the same as Abeokuta to Sokoto via Ilesha. The line from Jebba would serve a larger population en route, and be more convenient for administrative purposes. The deciding factor in favour of the Jebba route may be that the Ilesha line is not so important as other lines in Southern Nigeria, while the Sokoto extension cannot afford to wait.
POSSIBLE EXTENSION TO ZINDER. – The Kano Railway may be extended some day to Zinder, the headquarters of the French Territoire Militaire du Niger. The extension would tap a good grain and groundnut district and existing potash traffic, and while primarily justifiable only as a convenience to the French would doubtless pay its way in a few years time.

STATISTICS ILLUSTRATING THE RESULTS OF WORKING OF WEST AFRICAN RAILWAYS.

The development of traffic due to the construction of railways in West Africa has invariably exceeded all expectations, and it would be rash to assert that any section, however unpromising, would not pay its way. In Appendix 2, I have collected some figures of interest concerning West African railways. It will be seen that in 1911 the Sierra Leone Railway earned over 3 1/2 per cent., the Lagos Railway nearly 4 1/2 per cent., and the Gold Coast Railway 9 per cent. on their respective capital costs. The newly-constructed Baro-Kano Railway will pay its way this year. The first section of the Cameroons Railway started paying its way as soon as it was handed over to open lines. In 1909 the Dakar-St. Louis Railway cleared 11.3 per cent., the Kayes-Niger 2.2 per cent., and the Konakri Railway 3.7 per cent. on the capital cost, and the Ivory Coast and Dahomey Railways, though not yet paying expenses, were showing very rapid improvements in their returns.

FUTURE CONNECTIONS BETWEEN INTERNATIONAL SYSTEMS.

One is led to speculate on the chances of intercommunication at some future date between the British, French, and German systems of transport in West Africa. It may be premised that international systems will not be linked up except for their mutual advantage. The most likely circumstances to fulfil this condition appear to be the desire for the cheapest outlet to the coast, the desire to use the railway of an intervening country for intercommunication between two colonies of the same European power, and the advantage of obtaining cheaper coal from West African sources.

The first of the above reasons might ultimately lead to a line from the Thiès-Kayes to the Gambia, in view of the necessity for the cheapest possible outlet for the comparatively low grade produce of Upper Senegal and Niger. The district of Kissidugu in French Guinea is more likely to be served by a branch railway from the Konakri line from about Suarella, through Farana, than by an extension of the Sierra Leone Railway.

Assuming that a railway is built from the Lagos line in the direction of Ilesha, a likely connection would appear to be between this line and Paraku to facilitate
communication between the remainder of French West Africa and Zinder, via Kano, and also it may be, to supply the French railways with coal from Udi, a possibility worth bearing in mind when designing the cross lines in Nigeria.

A junction with the German railways appears to be less likely, as it is hoped that coal and oil deposits exist locally in the Cameroons.

Suggested Trans-African Railway. – I am afraid there is no time to review the project for building a railway from Algeria via Lake Chad, to connect with the Congo and South African systems. The proposed branch of this line to connect with the French West African system possesses added importance, in view of the recently-adopted policy of raising a native army in French West Africa for service in North Africa. The length of line to be built would be about 1,700 miles from the Algerian Railway to the Chad, and a 600-mile branch to the French West African system. From Lake Chad to Stanleyville would be roughly 1,500 miles more. The total cost is estimated at about 13 million sterling for the line to the Chad and branch to the Niger, and about eight-and-a-half millions for the second portion. A reconnaissance party has recently traversed the whole of the proposed route to the Chad and to the Niger, and is understood to have reported on the physical practicability of the scheme, which, if ever carried out, would attract the railways of all West African colonies to itself. At present the prospect of financing such a line may be very remote, but, apart from a possible discovery of minerals on the proposed route, the world-wide demand for accelerated communication, and the rapidly increasing importance of West and Equatorial Africa, may not inconceivably lead to the project maturing in the next generation.

Standard Gauges of West Africa. – Every junction of a British with a foreign line will involve a break of gauge. It is too much to expect the metre gauge to have been adopted from the commencement in British West African colonies on the chance of future connections with foreign systems, although Sir Walter Egerton, in or about 1904, actually suggested that the 124 miles of Lagos Railway then constructed should be relaid in metre gauge.

CONCLUSION.

It is, I hope, established that for the development of West African colonies by railways, a comprehensive scheme, based on the application of general principles to local conditions, is necessary from the very first, and it is submitted that no deducible conditions of the future are so remote as not to be given some weight in the framing of this general scheme. As the prosperity of a country increases, its arteries of communication become more and more important, and with increasing competition, disadvantages in the channels of transport, comparatively unimportant in the early stages, begin to accentuate themselves and may...
possibly have far-reaching influences, while the immediate considerations which governed the transport policy in the first case may have lost their force.

It is realized that conditions change and fresh information is always coming to hand to alter the data on which the earlier schemes are based, that progress cannot wait indefinitely for facts depending on itself, that lines have been and will be constructed more or less in the dark, that every such line adds to the difficulties of framing the best general scheme, and that a patchwork system may result.

Under the circumstances I venture to assert that the first need is for the systematic collection and co-ordination of data with a view to determining with confidence the future trunk lines of railway. A great deal of information exists in a diffused form, and merely requires focussing to throw valuable light on the subject. Further information will have to be searched for with special reference to railway development, and the man on the spot with full knowledge of local conditions must be trusted to marshal the data and formulate the conclusions. It is not unlikely that the alternatives to choose from may be few. It may be that the route once selected must be closely adhered to, or, on the other hand, that the decision as to alternative routes may be safely reserved, but until the trunk line policy is defined there will always be risk of inconsistency with its attendant evils. Once the question of trunk lines has been settled, every projected and existing line resolves itself into either part of the main line, or a local or feeder line, and further construction can be confidently carried out in the order most profitable.

APPENDIX 1.

[...]

APPENDIX 2.

APPROXIMATE DATES AND COST OF CONSTRUCTION AND RESULTS OF WORKING OF WEST AFRICAN RAILWAYS.

<table>
<thead>
<tr>
<th>Railway</th>
<th>Main Line</th>
<th>Average cost per mile to construct</th>
<th>Year</th>
<th>Miles Open</th>
<th>Cost of working per open miles</th>
<th>Percentage of working expenses to gross revenue</th>
<th>Approx. interest earned on capital cost</th>
<th>Gain or loss per mile of line open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lagos Railway</td>
<td>1896-1912</td>
<td>£460 Minna*</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>1902</td>
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<td>89.6</td>
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<td></td>
<td></td>
<td>1903</td>
<td>124</td>
<td>365</td>
<td>89.4</td>
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<tr>
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<td></td>
<td></td>
<td>1904-5</td>
<td>124</td>
<td>425</td>
<td>88.5</td>
<td></td>
<td>+55</td>
</tr>
</tbody>
</table>

* Minna to Zungeru, 38 miles, built 1910 from Minna.
<table>
<thead>
<tr>
<th>Railway</th>
<th>Main Line</th>
<th>Average cost per mile to construct</th>
<th>Year</th>
<th>Miles Open</th>
<th>Cost of working per open miles</th>
<th>Percentage of working expenses to gross revenue expenses</th>
<th>Approx. interest earned on capital cost</th>
<th>Gain or loss per mile of line open</th>
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</thead>
<tbody>
<tr>
<td>Baro-Kano Railw’y</td>
<td>1907-1911</td>
<td>356 Kano</td>
<td>£</td>
<td>1905-124</td>
<td>452 78.2</td>
<td>+126</td>
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<td>Bauchi Light do.</td>
<td>1911</td>
<td>1912 R 90</td>
<td>£</td>
<td>1904-168</td>
<td>582 61.76</td>
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<tr>
<td>Gold Coast Railway</td>
<td>1898-1903</td>
<td>170 Coomass</td>
<td>£</td>
<td>1908-168</td>
<td>447 49.61</td>
<td>+549</td>
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<tr>
<td>Gold Coast-Accra Railway</td>
<td>1909-1911</td>
<td>Mangoase</td>
<td>£</td>
<td>1911-188</td>
<td>543 35.71</td>
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<tr>
<td>Sierra Leone Railway†</td>
<td>1896-1904</td>
<td>221 Baiama</td>
<td>£</td>
<td>1902-76</td>
<td>280 99.7</td>
<td>+1</td>
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<td>1908-228 Pendembu</td>
<td>£</td>
<td>1901-76</td>
<td>244 104</td>
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<tr>
<td>Dahar St. Louis‡</td>
<td>1882-1885</td>
<td>165 St. Louis</td>
<td>£</td>
<td>1897-165</td>
<td>340 107</td>
<td>–23</td>
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<tr>
<td>Kayes-Niger</td>
<td>1881</td>
<td>1906 Koulikoro</td>
<td>£</td>
<td>1897-165</td>
<td>490 46</td>
<td>+114</td>
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<td>Thiès-Kayes*</td>
<td>1907-1910</td>
<td>Will be under c’nstr’ction Kayes /</td>
<td>£</td>
<td>1910-347</td>
<td>56 2.2</td>
<td>+114</td>
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* June to December only.
† 2' 6" gauge.
‡ 44 lb. rail.
§ Rails reached mile 347 in December 1904. Almost entirely native subordinate staff, including engine drivers.
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<tr>
<th>Railway</th>
<th>Main Line</th>
<th>Commenced</th>
<th>Completed</th>
<th>Miles</th>
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<tr>
<td>Dahomey Railway††</td>
<td></td>
<td>1900</td>
<td>1910</td>
<td>162</td>
<td>Savé</td>
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<td>1903</td>
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<td>Dehomoy, Dortmund to Sakete†‡</td>
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<td>1908</td>
<td>25</td>
<td>Sakete</td>
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<td>French Guinea§§</td>
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<td>1900</td>
<td>1910</td>
<td>367</td>
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<td>Ivory Coast¶¶</td>
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<td>1904</td>
<td>1912</td>
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<td>Bouaké</td>
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<td>1907</td>
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<td>108</td>
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<td>1905</td>
<td>1907</td>
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<td>Anecho</td>
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<td>1905</td>
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<td>Cameroons (Northern)</td>
<td></td>
<td>1910</td>
<td>102</td>
<td>Ngonsambo</td>
<td>1911**</td>
<td>100</td>
<td>150</td>
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<td>1912††</td>
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<tr>
<td>Cameroons (Centre)†‡‡</td>
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<td>Under constr will be</td>
<td></td>
<td>Mbalmajo</td>
<td>178</td>
<td></td>
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</tbody>
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* About 240 miles completed. Work being carried out both ends. Net revenue Kayes-Ambidédi, 1910, £18 mile
† 48 lb. rail. There is a 20 mile branch to Segboroué.
‡ Surface tramway over easy country. Gross revenue, 1907 £1,556, 1909 £5,303.
§ Now being extended 40 miles to Kankan.
¶ Expenses of working construction traffic have been charged, but no revenue claimed.
** Last nine months only] Entirely native subordinate staff except engine drivers.
†† First six months only. Three trains a week each way.
††† Line reached Edea, 1912.

**Note**. – In 1911 the working of the Thiès-Kayes (Thiès section), Kayes-Ambidédi, Kayes-Niger, Konakri-Karoussa, and Ivory Coast lines resulted in a net revenue of £119,040.
DISCUSSION.

Mr. Frederic Shelford: I thank you very much for the honour which you have conferred upon me, Sir Clement, in asking me to make a few remarks. And in response to the invitation, there are perhaps a few observations which I might make to add to the interest of the paper which we have heard. First, some general conclusions in regard to the African railways.

Competition between River and Railway.

Captain Mance said, at one point in his paper, that the Niger River formed an important competitor with the Nigerian Railway to Lagos. That, of course, remains to be seen, but as a general rule, I think we may take this as the fact, that railways cannot compete with ocean-borne traffic. That, I think, is fairly obvious. With regard to the Cape to Cairo Railway, which has been spoken of, if you were sending goods to the Cape, even if that railway were built, you would hardly expect that it would be cheaper to take them right across Africa than round the Cape by sea. And even with regard to passenger traffic, if a passenger were not in a great hurry I am sure he would find it more comfortable to go by Union Castle steamer than to go across Africa in a jolting train. With regard, however, to the problem of the partially navigable river, that is quite different. The Niger River I have been up at any rate once, with Sir Percy Girouard, and at his request made a rough survey. I found that it is not navigable for any vessel all the year round, at any rate when you get above Lokoja, and even below that it is not very navigable, even for steamers drawing two feet only, because I myself was once stuck on a sand-bar for 36 hours. And under those conditions, when you have valuable commodities to carry, I think it is more likely that they will be sent by rail than by the river. Sir Percy Girouard based a scheme of communication in Nigeria upon the Niger River; he pointed out that that river was not being used at all, or hardly at all, and his idea was to convey goods up and down the river as far as Baro, and from there by the Baro-Kano Railway. It remains to be seen whether Sir Percy Girouard's scheme will work out, because in competition with that you have the Nigerian Railway, which, I think, is more likely to get the traffic.

The Question of Railway Gauges.

I must say a word about the question of railway gauge in West Africa, which Captain Mance has mentioned. Africa has now, in spite of all the efforts of a great many of us, got into a fearful jumble with regard to gauges: South Africa 3 ft. 6 ins.; Egypt 4 ft. 8 1/2 ins. and 3 ft. 6 ins.; Uganda the metre gauge; all the French railways of West Africa the metre gauge; Sierra Leone 2 ft. 6 ins.; Gold
Coast 3 ft. 6 ins.; Nigeria 3 ft. 6 ins., and 2 ft. 6 ins. As far as the last is concerned, I did all / that I possibly could about five years ago, practically unassisted, to prevent the introduction of the 2 ft. 6 in. gauge into Northern Nigeria, but somehow it has managed to arrive. I think the lesson of India, with regard to gauges, is one which should not be forgotten. The state of things in India now is such – I do not know India personally, but I know a good deal of it – that in parts of it you actually have two railways running side by side, one of one gauge and the other of another gauge. The beginning is so insidious, it is like a disease. At one time you want to make a little railway. You have not much money for the purpose; you make out that a 3 ft. 6 in. gauge railway would cost so much, and that a 2 ft. 6 in. gauge one would cost a little less. You yield to temptation – which is always a bad thing – and you go in for the little gauge, 2 ft. 6 ins. Then a time comes a little later, when you want to extend it. That has happened in Northern Nigeria, and this line to the tin fields has to be extended, and you have not the courage to alter the gauge – or I ought to say you may have the courage but I have never seen it shown yet – and so you extend it on the 2 ft. 6 in. gauge again. And so on it creeps, until it is possible you will have in Africa, as you find in India, two railways running side by side of different gauges, and the thing getting hopelessly mixed up.

[...]

Dr. T. Miller Maguire, M.A., LL.D.: I should like to ask a question. Very grave doubts are often expressed as to whether African or American natives have hitherto benefitted in the least by the introduction of European civilization – falsely so-called. I know that Khama protested that railways would ruin Bechuana! Does the gallant Lecturer believe that any material or moral benefit will accrue to the natives by the proposed railways, French and British, which he has so very ably described? Will the male or female natives in the districts traversed by these rapid means of transit not lose more than they will gain? Will they be exploited? Shortly, will any material or moral good to humanity at large arise in these benighted lands from the railways? Is there not a great danger of the natives becoming mere decadent adjuncts of machines, like the poor victims of the 'Manchester School' in Lancashire or Lanarkshire. I would much prefer that my friends should be native warriors than North of England miners. The native women – as they are – must be far superior in every way to the poor sweated girls on coal pit banks, or in factories, or in the Liverpool or Glasgow slums, which I have explored. Will the effects of railways be human degeneracy or improvement? This is a vital matter in my mind, and of strategic importance with regard to the / future of the military forces of West Africa, and of more importance to all of us here than whether the management of these new, and, perchance, deadly innovations, be in the charge of State bureaucrats or of commercial adventurers.

The Chairman, Sir Clement Hill, K.C.B., K.C.M.G., M.P.: It is my pleasant duty to say a few words on this paper. And though I cannot pretend to say
anything on the technical part of it, I can say that it has given me immense pleasure to come here to-day, because all the names which have been mentioned now, the railway termini and the places of interest for the future construction of railways, were names most familiar to me in those great proceedings which took place, and which terminated in 1898, when we were discussing with France the division of these districts. At that time all the explorers and those engaged on the delimitations had to go on foot, and there was hardly a sign of a railway, if such did exist at that time. It is almost impossible to realize that those places were so little in touch then, and yet are so close now. And we are trying to bring them into still closer communication by means of the railway.

**Government and Private Enterprise.**

There is a point which our Lecturer did not touch upon, one which struck me first on reading his paper, and that was, that he only deals with the construction of railways by the Governments of the countries. I know it has been a cardinal principle with the Crown Agents, of this country at all events, and, I daresay, with the Government institutions of other countries, that they can build railways cheaper than commercial companies can, and that therefore they begin by building these railways in these wilder countries, so far as they can, for the Government, instead of putting them out to contract. But I have always held, that – though it may be possible, and though it certainly is desirable, that such a scheme as has been foreshadowed by Captain Mance should be borne in mind by the Governments, and that they should keep their eyes on the strategical and commercial advantages that are to be obtained from the carefully thought out construction of railways in this country – it is nevertheless open to question whether, when we have built railways – if they are to be built cheaper by Government contracts and enterprise – they should not be offered to private companies to develop. Of course, that is a very unpopular view with many people, I know, because there is a great tendency now to nationalize the railways and everything else. At the same time, it seems to me it is very difficult in this country which we have been talking about, to get railways developed. This is not a political question; whichever Government is in power has very great difficulty in coming to the House of Commons and saying I want a large grant of five or six millions so as to carry out a comprehensive scheme of railway development in this or that country. We can remember all the opposition there was to the Uganda Railway, which was built by the Government, not as a commercial enterprise, but to carry out our obligations under the Brussels Act, which constrained us to develop countries that we had taken over and to put down the slave trade. Now, in spite of what Mr. Harcourt has done – and I give him great credit for his wish to develop these railways – he would agree that it is very difficult to come to
the House of Commons and get these large grants whenever developments and feeders are required for certain railways. And it can only be done by the expression of opinion by those who hold the view that it would be conceivably worth while to sell some of these railways, or make them over under certain conditions as to transit rights, etc., with provision that the trade shall not be stifled in any way, so as to see if they could not develop the country quicker than we can by Government enterprise. That has always been more in my mind than anything else when I have heard of these Government railways, or have had, as I did with the Uganda Railway, to take part in their construction. At all events, I think the idea is worth considering.

**The Problem of Native Labour.**

There was nothing in the paper to show us how these railways are built, how we get native labour, what labour there is, how it is employed, whether there is a sufficient supply of it, whether it comes very willingly, or whether any pressure has to be put on the chiefs to cause them to supply it. We know that there are very great risks in the obtaining of native labour in the building of railways: in the construction of the Uganda Railway we could not get any native labour at one time, and we employed 26,000 Indian coolies on the line. Though they enabled us to build the railway, it was a very expensive method of getting labour; we were hampered by all sorts of regulations by the Indian Government, with the object of ensuring that the labourers should be well treated, and at that time we had to press the railway on. But we were unable to get native labour; and I should like to hear, if Captain Mance can tell us, how the supply for the construction of this railway is obtained in West Africa.

**The Lecturer, Captain H. O. Mance, D.S.O., R.E.,** in reply, said: With regard to the navigability of the Niger, time will show to what extent this river can be relied on. If, however, nothing further is done to try to improve the river, the trial cannot be considered a complete one. At present, during low water, the chances of a vessel grounding are as largely dependent on the skill of a native pilot as on the depth of the channel.

**Construction by Government or Companies.**

Referring to the Chairman’s remarks on the subject of the construction of railways by Government, it is hoped that the success of railway construction in Nigeria will be a very good argument in itself for Government continuing to construct railways. I think the Chairman had principally in mind the very important matter which is half the business of constructing railways, and that is the provision of funds. It is to be feared, however, that if companies are allowed to construct railways, they would be concerned more with making them pay
than with the development of the country by them, which is the main object of a Government. As regards the provision of funds, it is not necessary to furnish a very large amount all at once; it would be probably better for the Government to furnish sufficient funds to construct, say, 200 miles of railway a year regularly. That would enable traders to follow up the railway as it is extended, and it would have the added advantage of cheapening construction by retaining the same staff of engineers and foremen on the work. I hope the Chairman’s remarks will be taken to heart in the right quarter, and that money will be forthcoming, because I am certain it will be very well spent, and it will repay itself again and again. / 

Native Labour.

I should have preferred that Mr. Goldsmith, who has written able articles on the subject, should have given us his views on the subject of the employment of native labour on the Nigerian Railways. The system employed in Northern Nigeria has been since strongly recommended in a French paper for introduction into French West Africa. It depends on enlisting the co-operation of the political staff in the administration of labour. This was most successfully accomplished in Northern Nigeria, where the political and railway staffs worked in complete harmony. The principle was, as far as possible, to keep the same organization on the works as in the villages. The natives who worked together were recruited from the same district; they came with their own headmen, and they had their own miniature villages alongside the railways. As far as possible, we employed only those who lived near the work. Labourers were well treated by people who thoroughly understood them, as the railway staff very soon got to know the conditions of the country. The adoption of task-work resulted in a full day’s work being usually completed at an early hour of the afternoon. Wages were paid into each labourer’s own hands in cash by a European paymaster. The result was that the natives knew they could expect actual money for the work they did, and that they could do with it what they liked. We went to considerable trouble – and sometimes it was a great nuisance – to pay these labourers once a week. The question of food supply received constant attention. The only natives who came from the coast were artizans, who could not be obtained locally. A limited quantity of floating labour was also available.

I am unable to give you further information on the subject of coal in Nigeria, but I understand it is considered to have better prospects than the lignite, which is found in the same neighbourhood.

I do not think I can go into the question of whether railway construction tends to improve the condition of the inhabitants. It seems to me that this point is more an ethical one, and is beyond the scope of this lecture. I may, however, be allowed to mention one phase of it. Assuming it is desired to give the natives
the best administration we can; this administration costs money, and, in order to get the money without injustice to the inhabitants, it is necessary to increase their prosperity. That cannot be effected beyond a certain point without means of communication, which will enable them to expand their markets. Therefore, from the point of view of the philanthropist, the improved administration which we feel we can give to these natives – better administration, we think, than that of other great nations – can be obtained indirectly by providing railways.

[...]
THE BEIRA & MASHONALAND & RHODESIA RAILWAYS.

This Railway System comprises 2,462 route-miles of 3-ft. 6-in. Gauge Line, is owned by Six Companies, and runs through Five Distinct Territories, Following a recent inquiry, negotiations between Delegates of the Governments of Southern Rhodesia, Northern Rhodesia and Bechuanaland, and the Owners of the Railways, resulted in Parallel Legislation being passed in the Three Territories, to enable a Railway Commission to be set up to exercise Control of Rates.

Although there are 2,462 miles of open line owned by the various railway companies comprised in the Rhodesian system, the Beira & Mashonaland & Rhodesia Administration only operates 1,865 miles, the South African Railways Administration working the 597 miles running from Vryburg to Bulawayo, including the Matopos branch. Of the total mileage of 2,462 miles, no more than 1,252 miles are situated in Southern Rhodesia, and of the six companies, the Blink-water Railway Company is the only one which is confined to that colony.

The gauge of the whole of the lines is 3 ft. 6 in. The area of the territories served is approximately 440,000 square miles. The capital cost of the combined undertakings approaches £18,000,000, or approximately £7,000 per mile. The railway system of 2,462 miles is a large one to serve the small population of Rhodesia. The approximate number of European inhabitants per mile of railway averages 24, as against about 160 in the Union of South Africa. The considerable native population contributes little as yet towards the revenues of the railway, although in course of time it will become a factor of increasing importance.

For the year ended September 30, 1926, the last date for which figures are available, the Beira & Mashonaland & Rhodesia Railways had satisfactory results. Their earnings amounted to £4,248,610, an increase of £271,073 over the
previous year, while their gross operating expenditure at £2,535,175 showed an
increase of £358,348 over the year 1925. Thus net revenue was £1,713,435, the
operating ratio being 59.67 per cent., which was slightly higher when, compared
with the 54.73 per cent. of the previous year. Various circumstances, outside the
scope of ordinary railway working, were responsible for this position, the chief
cause being the heavy expenditure to repair the track after the unprecedented
floods of January–March, 1926.

History and Development.
The line of railways towards the north from Vryburg was started some 34 years
ago owing to the foresight and driving force of Cecil Rhodes, who from the
outset clearly foresaw that connections with, the seaboard at Beira, as well as
with the Cape system of railways, were essential to the development of the vast
hinterland of Rhodesia, and planned his railway schemes with those objects in
view.

The first section, from Vryburg to Mafeking, was commenced in 1893,
Bulawayo being reached in 1897. Meanwhile, communication was in process of
being established with the seaboard. Salisbury was reached from Beira in May,
1899, the conversion of the line in Mozambique territory from narrow gauge
to 3-ft. 6-in. gauge being completed on August 1, 1900. In October, 1902, con-
nection was established between Salisbury and Bulawayo at a point 50 miles
east of the latter town. The line was then pushed north vigorously to tap the
Wankie coalfields area. The Victoria Falls were reached on April 25, 1904, and
by the beginning of 1906 a further section of about 375 miles up to the Broken
Hill Mines had been completed. The railway finally reached the Congo border
in November, 1909.

[...] The system is essentially centred on Bulawayo, from which there is a line
running south-westerly through the Bechuanaland Protectorate and the Cape
Province down to Vryburg, 597 miles from Bulawayo. A second line extends
in a north-westerly direction from Bulawayo to Victoria Falls, a distance of 280
miles, and then proceeds, roughly, to the north via Kalomo and Broken Hill to
the Congo border, a distance of a little over 500 miles. A third line / runs from
Bulawayo, roughly north-easterly through Heany Junction and Gwelo, at both
of which places there are branches, to Salisbury, some 300 miles distant, and
at Salisbury turns sharply eastwards to Beira, a further distance of 374 miles.
[...] From north to south the railway system extends approximately for 1,100
miles, and from east to west 650 miles. Connections are made at Mafeking and
Vryburg, on the southern line, with the South African system; at Dondo Jun-
ton, near Beira, with the Trans-Zambesia Railway; and on the Congo border at
N’dola with the Katanga Railway.
Anon., 'The Railways of Africa' 181

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<td>3,734,000</td>
<td>2,084,000</td>
<td>1,650,000</td>
<td>242,000 Sur.</td>
<td>3,957,000</td>
</tr>
<tr>
<td>1926</td>
<td>18,000,000</td>
<td>3,963,549</td>
<td>2,403,012</td>
<td>1,560,537</td>
<td>624,993 Sur.</td>
<td>4,236,000</td>
</tr>
</tbody>
</table>

Results of Working in 1926, and in Five-Yearly Intervals, Beira & Mashonaland & Rhodesia Railways.

The growth of the railway system is illustrated by taking figures at five-yearly intervals. Such figures exclude all results applicable to the line between Broken Hill and the Congo border, which is leased from the Rhodesia-Katanga Junction Railway Company. As represented by the train-miles run, the business of the railways has increased very rapidly. Except for the period covered by the war, every five years has seen an additional million train-miles added. In 1926, aggregate train-miles were more than four times those of 1905.

The mileage of the railways owned by the various railway companies is shown in the following table, which indicates that the railways run through five distinct territories.

<table>
<thead>
<tr>
<th>Company.</th>
<th>Territories Served.</th>
<th>Total Mileage.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Rhodesia Railways Limited</td>
<td></td>
<td>1,396</td>
</tr>
<tr>
<td>Vryburg to Ramathlabama</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Ramathlabama to Ramaquabane</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Ramaquabane to Bulawayo (including Matopos Branch)</td>
<td>91</td>
<td>–</td>
</tr>
<tr>
<td>Salisbury to Victoria. Falls Bridge (including Gwelo to Selukwe Branch and Heany Junction to West Nicholson Branch)</td>
<td>706</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>112</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>394</td>
</tr>
<tr>
<td></td>
<td>91</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>706</td>
<td>–</td>
</tr>
</tbody>
</table>
### Mileage and Distribution of Lines belonging to the various Railway Companies.

<table>
<thead>
<tr>
<th>Company</th>
<th>Southern Rhodesia</th>
<th>Northern Rhodesia</th>
<th>Union of South Africa</th>
<th>Bechuanaland Protectorate</th>
<th>Mozambique Territory</th>
<th>Total Mileage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victoria Falls Bridge to Kalomo</td>
<td>93</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>The Mashonaland Railway Co. Ltd.: Kalomo to Broken Hill</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>607</td>
</tr>
<tr>
<td>Umtali to Salisbury</td>
<td>170</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Salisbury to Sinoia</td>
<td>83</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Mount Hampden Junction to Shamva</td>
<td>73</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>The Beira Junction Railway Co. Ltd.: Beira to Ponte do Pungwe</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>35½</td>
<td>–</td>
</tr>
<tr>
<td>The Beira Railway Co. Ltd.: Ponte do Pungwe to Umtali</td>
<td>6</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>162½</td>
<td>–</td>
</tr>
<tr>
<td>The Blinkwater Railway Co. Ltd.: Gwelo to Victoria</td>
<td>123</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>The Rhodesia-Katanga Junction Railway &amp; Mineral Company: Broken Hill to Congo Border</td>
<td>–</td>
<td>132</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>1,252</td>
<td>506</td>
<td>112</td>
<td>394</td>
<td>198</td>
<td>2,462</td>
</tr>
</tbody>
</table>

### Control

The control of the whole system, with the exception of the Blink-water Railway and the Rhodesia-Katanga Junction Railway & Mineral Company, is in the hands of the British South Africa Company. That company holds approximately 85 per cent. of the shares in the Rhodesia Railways Trust, which in turn holds 7,989 out of a total of 8,000 shares in the Rhodesia Railways Limited, and 449,612 out of a total of 450,000 in the Mashonaland Railway Company.

The British South Africa Company also have control, through voting power, of the Beira Railway Company and the Beira Junction Railway Company.

The Rhodesia-Katanga Junction Company is not controlled by the British South Africa Company, which is, however, represented on the board. The bulk of the ordinary shares were originally issued to the Tanganyika Concessions Limited; but there is no information obtainable locally as to the present own-
ers, beyond the fact that the British South Africa Company has not, either itself or through the various railway companies, a sufficiently large holding to give it control, the Rhodesia and Mashonaland Railways have a lease of the Katanga Junction Company’s lines until 1938. Further, the British South Africa Company have an option to purchase the line – at cost, plus 10 per cent. – in 1928 and every subsequent 5 years.

The following statement sets out the authorised capital, as at September 30, 1928, of the companies comprised in the Rhodesian Railway System, excluding the Rhodesia Katanga Junction Railway:

<table>
<thead>
<tr>
<th>Company</th>
<th>Shares</th>
<th>Debentures and Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mashonaland Railway Co. Ltd.</td>
<td>450,000 of £1 each</td>
<td>5 per cent. £5,060,000 debs.</td>
</tr>
<tr>
<td>Rhodesia Railways Limited</td>
<td>8,000 of £1 each</td>
<td>4 per cent. £3,997,130 debs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 per cent. £252,870 debs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 per cent. £1,000,000 ten-year joint secured notes.</td>
</tr>
<tr>
<td>Beira Railway Co. Ltd.</td>
<td>–</td>
<td>4½ per cent. £1,100,000 debs.</td>
</tr>
<tr>
<td>Beira Junction Railway Co. Ltd.</td>
<td>250,000 ordinary</td>
<td>6 per cent. £250,000 debs.</td>
</tr>
<tr>
<td></td>
<td>500,000 (6 per cent. Cum. Preference. Both of 5s. each.</td>
<td>5 per cent. £200,000 debs.</td>
</tr>
<tr>
<td>Blinkwater Rly. Co. Ltd.</td>
<td>200,000 of £1 each</td>
<td></td>
</tr>
</tbody>
</table>

Practically the whole of the capital has been raised by debentures.

Chart of Organisation, Beira & Mashonaland & Rhodesia Railways.

The Mashonaland & Rhodesia Railway Companies raised some £13,000,000 by means of debentures and notes, every penny of which was borrowed originally at much lower rates than would otherwise have been possible, on the credit of the British South Africa Company. That company is still contingently liable, under its guarantees, for about £7,000,000 of Mashonaland and Rhodesia Railways’ debentures. £2,000,000 of notes were redeemed on August 1, 1927.

The share capital, viz., £8,000, of the Rhodesia Railways Limited does not and never was intended to bear any relation whatever to the actual value of the undertaking. It was merely a figure chosen for convenience of definition of interests which were in very few hands. Practically the whole of the shares of the Mashonaland and Rhodesia Railway Companies are now held by the Rhodesia Railways Trust Limited, a company formed in 1899, having for its object the amalgamation of the interests of the shareholders in the two first-named companies.

The Beit Railway Trustees, who administer the terms of the will of the late Mr, Alfred Beit for the promotion, construction and furtherance generally of
railways, telegraphs (including wireless telegraphy) and telephones, &c, hold practically the whole of the share capital of the Blinkwater Railway Co. Ltd.

Subsequent to September 30, 1928, the Mashonaland and Rhodesia Railway Companies have made an issue of £6,000,000 6 per cent. debentures for the purposes of:

(a) Redeeming £1,000,000 6 per cent. 10-year joint secured notes.

(b) Purchasing from the Rhodesia Railways Trust Limited engines and rolling-stock of a value of £1,000,000, formerly leased from that company under hire-purchase terms.

(c) Effecting payment for engines, rolling-stock, extensions to existing workshops and plant, and the construction of new works.

(d) Purchasing £1,500,000 of the new 6 per cent. debenture stock recently created by the Beira Railway Company in order to redeem their 4 per cent. debentures and 6 per cent. income debenture stock.

In amplification of (d) above, it should be added that the Beira Railway Company raised £2,000,000 6 per cent. debentures, plus 1 per cent. sinking fund, so as to provide funds to redeem their 4½ per cent. debentures and 6 per cent. income debenture stock. Of this new issue, £1,500,000 was subscribed for by the Mashonaland Railway Co. Ltd.

Organisation and Management.

The control of virtually the whole system by the British South Africa Company has simplified the question of management. The Rhodesian Railways Limited is the managing company for the whole system, except the Vryburg-Bulawayo section. Agreements for this purpose are in force with the Mashonaland Railway Company, the Blinkwater Railway Company, the Beira and the Beira Junction Railway Companies.

Under recent legislation a Railway Commission has been set up for the purpose of controlling rates on the system. Under the legislation which has been passed the Commission is charged with seeing that such rates are charged as will suffice to meet all working expenditure and proper fixed charges and to provide, in addition, a sum to cover a definite contribution for payment of dividends and a sum towards the accumulation of a reserve. Any surplus above these sums is to be devoted to reductions of rates. The Commission comprises a chairman and three members, the first chairman being Mr. E. H. Hiley, C.B.E., and it is understood that Sir W. W. Hoy, the present General Manager of the South African Railways and Harbours, will succeed Mr. Hiley in due course. The General Manager of the Beira & Mashonaland & Rhodesia system is Colonel C. F. Birney, D.S.O.
The working organisation adopted, which was formerly departmental, was recently altered to a form of divisional control. This has been under consideration for some time, and was recommended in General Hammond’s report on the railway system of Southern Rhodesia which was presented to the Legislative Assembly last year.

The new organisation, a chart of which is given on this page, places locomotive running under a Chief Superintendent of Transportation, with mechanical and operating assistants. There are District Superintendents of Transportation at outside centres, each again containing operating and mechanical branches. The shops at Bulawayo and Umtali remain under the Chief Mechanical Engineer, as well as the supervision of all boilers, electric plant, &c, and the latter remains the principal adviser of the General Manager on all mechanical questions. The Engineering Department remains under the Chief Engineer, and is not included (as it is on the neighbouring South African Railways) in the Transportation Department.

The total staff on September 30, 1928, was 19,748, including 3,379 whites and 16,369 natives.

Permanenent Way and Works.

The railways of Rhodesia were built about twenty-five to thirty years ago as pioneer lines, and they have retained until quite recently the chief characteristics of such lines. The ruling factor in the construction of most of this system was the element of speed. For that reason the location of the line followed, generally speaking, the easy country found along the watersheds, thus avoiding the bridging of large rivers. Although construction was on the whole easy, the country traversed is in many parts broken, the most troublesome section being that between Beira and Umtali. The earthworks were extremely light and the formation width for cuttings and embankments very narrow, so narrow that in many places there was no proper room for a cess. Until recently stone ballast was practically unknown, and station buildings were limited to the strict minimum. Stations are still spaced at long intervals, and great use is made of intermediate crossing places with no resident staff.

Political considerations obviously determined the route from the south through the native area of the Bechuanaland Protectorate. The administrative capital having been fixed at Salisbury, the line from Beira went to that point by the route of least resistance. The Bulawayo-Salisbury line followed the watershed, with a deviation to the goldfields around the Globe and Phoenix Mine. The Bulawayo-Livingstone line was built to the Victoria Falls as part of the ‘Cape to Cairo’ system, and later extended to the mines round Broken Hill, and subsequently to the Katanga. Future agricultural production does not seem to have
been considered in choosing the routes of the 'main' lines. Most of the branches, such as the Blinkwater line, the Lomagunda line to Sinoia, and the Mazoe line to Shamva, were built in the first place to give access to some important mines. Some of them, particularly the Mazoe line and the Lomagunda line, have, however, opened up fertile agricultural areas which have developed a substantial traffic.

Although only 1,252 miles out of the 2,462 miles of the system are within Southern Rhodesia, it is nevertheless true that at least 2,000 miles were built to serve Rhodesia, and until the recent big development in the Congo, Rhodesia had difficulty in finding the heavy railway revenue which was essential. On the basis of 2,000 miles of railway, there is one mile of line to every 75 square miles of area, and one mile to every 7½ adult European males (1926).

Until a few years ago the railway system was regarded as a pioneer line, built to reach certain areas as rapidly and cheaply as possible. The situation is now quite different. In the first place the steady growth of the Katanga has shown the desirability of affording, both for the heavy imports into that territory and the exports of copper, a reliable and satisfactory means of transport. The more recent developments in connection with copper, zinc, and lead mines in Northern Rhodesia also call for the provision of further facilities, and a better service. At the same time there has been considerable development in the mineral industry in Southern Rhodesia, particularly in chrome and asbestos, and it appears that copper in certain areas offers further great possibilities. While, therefore, minerals have been responsible in the first instance for the provision of railway facilities, these have in turn led to the opening up of many areas and to great development in agriculture.

This changed aspect has placed upon the railway companies that serve these territories considerable additional obligations to provide a more reliable and more frequent service and more railway facilities generally for their clients. It is true that political considerations, at a time when there was some question as to whether Southern Rhodesia should enter the Union of South Africa, and the doubt which existed since Southern Rhodesia, received her Charter of responsible Government, have been the cause of a cautious policy of railway expenditure and have prevented the undertaking of broad programmes for development and improvement in the future. The situation has been largely cleared up by the negotiations which took place in 1926 in London between representatives of the Government, the Colonial Office, and the owners of the railways, as a result of which a Railway Act has been passed defining the financial position more clearly.

It is therefore possible now for the railway companies to embark upon a well-considered programme of improvements. These include:

\(a\) Regrading those sections of the line where a better gradient can be obtained at moderate cost.
(b) Widening the formation and providing adequate side drainage.
(c) The provision of crushed stone ballast throughout the main line.
(d) Increasing the number of culverts and waterways.
(e) Strengthening the standard of the track by the introduction of more sleepers per rail length, and where this is done the new standard will comprise 2,240 sleepers per mile as compared with 1,920 in the original construction.
(f) Many of the older bridges are being strengthened to take increased loads without restriction.

In addition to the above, a programme of relaying the track is actually in progress. On the Beira Railway a length of 168½ miles between Fontesville and Umtali was originally laid with the 2-ft. gauge, while the Beira Junction Railway, 35½ miles long, was also built on this gauge, but it is many years since these have been converted to the 3-ft. 6-in. gauge, which is standard throughout the country. The programme of rail renewals contemplates carrying out from 70 to 100 miles per annum, the new rails being of 60-lb. section. At the same time sleepers are also being renewed at the rate of some 120 to 150 miles per annum. Most of the line is laid with steel trough sleepers, the latest designs weighing 50 per cent. more than the original ones. In many places wood sleepers are used, the number depending on the output which can be obtained from the local sawmills.

The large increase in rolling-stock, actual or contemplated, involves the provision of increased and more efficient repair facilities, and the main railway shops at Bulawayo are to be enlarged considerably.

The necessity of improving the track by better draining and ballasting has assumed great importance. Rhodesia is often pictured as a dry land. In January, 1926, a station half-way between Beira and Umtali received nearly 9 in. in one day, and 43 in. in nine days. Such heavy rain will destroy anything but a very well-drained track; without ballast the whole formation becomes soft and waterlogged and cannot safely support heavy trains. It has therefore been arranged to ballast the whole main line with crushed stone, at an average cost of something like £600 a mile, or nearly £1,000,000 in all. Stone-crushing plant is installed in several quarries. Experience has also shown that in many bridges the amount of waterway provided in the first instance is insufficient to pass the flood waters under the railway without danger of damage to bridge or banks. There are many other directions in which the increased traffic calls for increased expenditure, such as water supplies, workshops and plant, running sheds and depots, quarters for staff, &c. To give some idea of what is involved in the latter, it may be mentioned that £50,000 was spent on houses for European staff during 1926.

The average length of track maintained by a permanent-way gang on the Rhodesian Railways is a little more than 7 miles, the maximum being about 11 miles,
decreasing to 6 on sharply curved sections. The number of natives employed on the track is about 1.83 per mile, increasing to 2.75 during the rainy season. The European gangers1 average 0.149 to 0.169 per mile.

During the last financial year a large amount of work was done in connection with bridges and culverts. The construction of a 100-ft, span bridge at Mile 34 on the Beira line was completed, and a start was made with the provision of additional waterways to meet flood conditions by utilising the 200-ft, spans of the old bridge over the Kwe Kwe River to provide 100-ft. span bridges at 37 miles 9 chains and 38 miles 4 chains, while certain existing culverts were extended and additional openings constructed at points where they were considered necessary. On the Salisbury-Kalomo section several small bridges were strengthened, the most important being the conversion of a 75-ft. lattice girder bridge over the Gwelo River into a double span by the provision of an intermediate pier. Many other new works were carried out, these including the extension of locomotive running sheds, provision of additional goods-traffic facilities, new station buildings, houses for the staff and an extension to the administrative offices, while a start was made with a scheme of afforestation on certain straight parts of the railway strip in the vicinity of gangers’ cottages, this having for its object the growth of trees suitable for railway sleepers.

Semaphore signalling is confined to home signals regulating the admission of trains to stations, and in one case only, at Bulawayo, route signals indicating to starting trains for which line the road is set. Ordinary practice at the smaller stations and at the whole of the unattended crossing sidings is for warning boards, painted white on the side facing trains to which they refer, and black on the side facing trains with which they are not concerned, to be fixed at a distance of 600 yards from the outermost facing points. These warning boards are treated as caution signals, and drivers of approaching trains must be prepared to stop clear of any obstruction between the warning board and the station or siding. At stations so equipped, shunting operations are allowed to take place while trains are in the section, providing such operations do not involve engines and vehicles approaching nearer than 200 yards to the warning board concerned. Shunting operations at stations and sidings involving the use of the main line are not allowed within 15 min. of the time of arrival of trains.

At the end of September, 1926, the locomotive stock (including shunting engines) numbered 165, with an aggregate tractive effort of 4,236,000 lb., the principal types being shown in the following table:
Anon., 'The Railways of Africa'

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Diam. Stroke</td>
<td>Ft. in.</td>
<td></td>
<td>Tons.</td>
<td>Lb.</td>
</tr>
<tr>
<td>7 th</td>
<td>30</td>
<td>17 in. × 23 in.</td>
<td>3 in. 6¾</td>
<td>4 – 8 – 0</td>
<td>83</td>
<td>18,660</td>
</tr>
<tr>
<td>8 th</td>
<td>17</td>
<td>19 in. × 24 in.</td>
<td>4 in. 0</td>
<td>4 – 8 – 0</td>
<td>96</td>
<td>24,370</td>
</tr>
<tr>
<td>9 th</td>
<td>30</td>
<td>20 in. × 24 in.</td>
<td>4 in. 0</td>
<td>4 – 8 – 0</td>
<td>108</td>
<td>25,500</td>
</tr>
<tr>
<td>9a</td>
<td>6</td>
<td>20 in. × 24 in.</td>
<td>4 in. 0</td>
<td>4 – 8 – 0</td>
<td>112</td>
<td>26,250</td>
</tr>
<tr>
<td>10 th</td>
<td>8</td>
<td>20 in. × 24 in.</td>
<td>4 in. 0</td>
<td>4 – 8 – 0</td>
<td>120</td>
<td>26,000</td>
</tr>
<tr>
<td>10 th</td>
<td>6</td>
<td>20 in. × 24 in.</td>
<td>4 in. 6</td>
<td>4 – 8 – 2</td>
<td>130</td>
<td>26,000</td>
</tr>
<tr>
<td>11 th</td>
<td>30</td>
<td>22 in. × 26 in.</td>
<td>4 in. 0</td>
<td>4 – 8 – 2</td>
<td>125</td>
<td>32,760</td>
</tr>
<tr>
<td>12 th</td>
<td>12</td>
<td>16 in. × 24 in.</td>
<td>4 in. 0</td>
<td>2 – 6 – 2</td>
<td>122</td>
<td>34,560</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garratt</td>
<td>12</td>
<td>16 in. × 24 in.</td>
<td>4 in. 0</td>
<td>2 – 6 – 2</td>
<td>122</td>
<td>34,560</td>
</tr>
</tbody>
</table>

The 12th class and Garratt locomotives were received during the financial year 1926, and enabled the record traffics of that year to be handled expeditiously. The latter engines have been allocated for use on the difficult section lying between Villa Machado and Umtali, where they have proved their ability to haul heavier loads on the steep grades and sharp curves more economically than was hitherto possible. A further 18 engines have recently been ordered to meet the continued increase in the traffics offering.

The coaching stock at the end of 1928 comprised 208 units, the principal types being 35 first-class and 35 second-class saloons, 25 native carriages, and 23 service coaches. On the freight side, there were 2,757 vehicles, this number including 512 45-ton steel open wagons, 550 37-ton steel opens wagons, 338 15-ton sheep trucks. 326 15-ton cattle trucks, and numerous covered wagons brake vans, water tank vehicles, &c. A further 107 45-ton steel open wagons have since been erected and placed in service, but increased traffic requirements have necessitated the ordering of an additional 100 vehicles of the same type.

A 45-ton steel open bogie vehicle is now the standard coal and mineral wagon, and 550 are in commission. A further 300 have just been ordered. It represents the heaviest eight-wheeled vehicle which is allowed on the 60-1b. track. It is 40 ft. long over buffers, has a tare weight of 16 tons and a carrying capacity of 45 tons. On a normal main-line train, after making allowance for the guard’s van, &c., this vehicle gives a ratio of 74 per cent. of paying load, compared to the total weight behind the engine tender. This compares favourably with coal or mineral wagons in other parts of the world.

Bogie livestock wagons have been specially designed to meet the requirements of long-distance cattle traffic. They are 41 ft. 6 in. long, and are divided centrally by a permanent partition to avoid bunching of animals en route. Protection against bruising is provided by padded bumpers at a height of from 3 to 4 ft. around the sides and ends. Speed and comfort are aimed at, and many of the vehicles are fit-

* This figure includes 10 locomotives in course of erection.
ted with carriage underframes and bogies, as they are used largely for conveying special train loads of live cattle from Bulawayo to Durban, a distance of over 1,000 miles. This journey is performed with only one intermediate feeding and watering stop en route. When not required in livestock traffic, they prove very useful in the conveyance of general merchandise, fruit, and maize traffics.

In order to provide comfortable accommodation for passengers travelling by goods train, six ‘composite’ goods guards’ vans have been placed in commission; these vehicles, 41 ft. 6 in. long, have two full-sized six-berth second-class compartments at one end, a native passenger compartment of 12 ft. at the other end, and in the centre, a luggage compartment of 12 ft. 2 in. and guard’s compartment of 4 ft. 5 in. All the compartments are electrically lighted.

Since 1919, all new goods stock placed in commission has been fitted with automatic couplers of the American type, and to-day approximately 37 per cent. of the goods vehicles in service are so fitted. The balance are being converted to the automatic type as opportunity offers.

Workshops.

The principal shops are located at Bulawayo, while there are smaller shops at Umtali. Approximately 432 men are engaged in the shops, the average out-turn of which is 90 locomotives, 100 carriages, and 4,000 wagons. The Bulawayo shops, which are well arranged for their specific function, cover 82 acres of ground, with 152,535 sq. ft. under cover. […]

Passenger and Freight Traffic.

For many years the traffic on the railways consisted of a few passengers and the necessary imported supplies from Beira and the Union of South Africa for the small widely scattered population; there was very limited local traffic between farms, towns and mines. Gold, which was the only important product exported, yielded little railway revenue by its transport, though much by its production. In the last few years there has, however, been a big expansion in traffic both on the passenger and freight sides, the latter principally in Rhodesian and in Congo base metal production.

The principal traffic of the railways consists of minerals. Coal from Wankie to the Congo and to the principal gold mines in Southern Rhodesia provides the largest tonnage (the total output of the colliery now amounting to over 600,000 tons per annum and increasing steadily); other minerals are copper from the Congo, chrome ore from Selukwe and Umvukwe districts, and asbestos from the Shabani area. The immense richly-mineralised area in the heart of Africa, comprising the tipper Congo or Katanga, and probably parts of Northern Rhodesia, is likely to provide more and more sources of traffic for which more than
one line of railway will compete. Maize has so far been considered the staple agricultural crop of the country, the export crop in a normal year being about a million bags. But other and more paying crops are receiving attention; tobacco especially, which has received a great stimulus from the Imperial preference, is going ahead by leaps and bounds.

The systems of consigning and invoicing goods, and of station accounting, are similar to those used in England and the Union of South Africa, the latter being outlined elsewhere. The periods of free storage allowed at stations In order to meet the convenience of farmers and others living at some distance from the stations are as follows: –

<table>
<thead>
<tr>
<th>Distance residing from Station.</th>
<th>When Goods are Handled by Railways and Warehoused or Stored.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within 2 miles</td>
<td>2 days</td>
</tr>
<tr>
<td>Within 10 miles</td>
<td>&quot;</td>
</tr>
<tr>
<td>Within 20 miles</td>
<td>7 &quot;</td>
</tr>
<tr>
<td>Over 20 miles</td>
<td>14 &quot;</td>
</tr>
</tbody>
</table>

After the expiration of the periods mentioned, storage charges are raised at 9d. per ton per day, when the goods are protected from the weather, and 3d. per ton per day when the goods are kept in the open unprotected.

Of the total freight revenue earned during 1926, over all sections, including the Rhodesia-Katanga Junction Railway, general goods subscribed £1,861,904, railway construction material £126,929, coal and coke £701,161, copper for export £416,638, chrome ore £176,691, asbestos £70,889, and livestock and vehicles £103,976, Passengers, parcels, and luggage brought in £461,874, or 109 per cent. of the total revenue. The aggregate number of passengers carried was 647,802, and the total tonnage of freight 1,777,619, both these figures showing substantial increases as compared with the previous year.

On the main line there are three to four passenger trains each way per week, the larger number running between Salisbury, Bulawayo, and Livingstone. There are also four passenger connections per week to and from Cape Town, Johannesberg, and other parts of the Union of South Africa. A typical passenger train timing is as follows: –

<table>
<thead>
<tr>
<th>Height above Sea Level.</th>
<th>Miles from Beira.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ft.</td>
<td>Ms.</td>
</tr>
<tr>
<td>2</td>
<td>Beira</td>
</tr>
<tr>
<td>3,552</td>
<td>204 27 Umtali</td>
</tr>
<tr>
<td>4,825</td>
<td>374 30 Salisbury</td>
</tr>
<tr>
<td>4,469</td>
<td>671 09 Bulawayo</td>
</tr>
</tbody>
</table>
The average load of passenger trains varies between eight bogies (approximate weight, 280 tons) on the Beira-Salisbury line and north of Livingstone, and 14 to 18 bogies (approximate weight, 490 to 830 tons) between Salisbury and Livingstone and also Bulawayo to Mafeking. Practically all main-line passenger trains are equipped with dining cars throughout.

Branch line services usually consist of about three mixed trains per week each way, conveying both passengers and goods.

Mention should be made of the recent large increase in tourist traffic to South Africa and Rhodesia. The magnificent Victoria Falls is one of the principal attractions luring tourists to South Africa, and the railway companies have spared no trouble or expense in providing a first-class hotel near the falls. It is evident that there is an ever-increasing desire on the part of tourists from America and elsewhere to penetrate into the less civilized parts of the world, and the attractions of the falls and the ancient ruins of Zimbabwe, as well as the chance of seeing native life in its primitive setting, have been the causes of a largely increased passenger traffic from overseas. This feature of railway working is receiving attention and new passenger stock is under order.

Lay-out of Bulawayo Station, Beira & Mashonaland & Rhodesia Railways.

A representative goods train timing (through port goods) is as follows: –

<table>
<thead>
<tr>
<th></th>
<th>Beira</th>
<th>dep.</th>
<th>3.30 p.m.</th>
<th>First day.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Umtali</td>
<td>arr.</td>
<td>9.26 a.m.</td>
<td>Second day.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;</td>
<td>10.55 a.m.</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td>Salisbury</td>
<td>arr.</td>
<td>11.48 p.m.</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;</td>
<td>2.50 a.m.</td>
<td>Third day.</td>
<td></td>
</tr>
<tr>
<td>Bulawayo</td>
<td>arr.</td>
<td>7.40 p.m.</td>
<td>&quot;</td>
<td></td>
</tr>
</tbody>
</table>

On the main line goods train services vary between three trains and six trains each way per day. Goods trains run at very nearly the same speed as passenger trains. The whole of the stock, both goods and passenger, is equipped with automatic vacuum brakes. The bulk of the goods trains carry through traffic and do not normally perform any shunting work between depots, this being done by specially appointed trains either once per day or every alternate-day according to requirements.

The largest terminal and depot stations, with the number of trains dealt with on the average, are as follows:–

<table>
<thead>
<tr>
<th></th>
<th>Average Number of Trains Daily.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beira</td>
<td>1</td>
</tr>
<tr>
<td>Salisbury</td>
<td>4</td>
</tr>
<tr>
<td>Bulawayo</td>
<td>5</td>
</tr>
<tr>
<td>Livingstone</td>
<td>2</td>
</tr>
</tbody>
</table>
Salisbury and Bulawayo goods depots each deal with roughly 20,000 tons of goods forwarded and received per month, and approximately 17,000 tons at Bulawayo and 13,000 tons at Salisbury are handled by the railways.

The sections of greatest traffic density are Umtali to Salisbury, 170 miles, and Wankie to Livingstone, 75 miles, both of which have approximately six trains each way per day. During produce export seasons the train service on the Umtali-Salisbury section exceeds the figure given by approximately two trains each way per day.

On the Umtali-Salisbury section the greatest distance between stations is 45 miles and the shortest 14 miles, the average being 24 miles. The largest number of crossing sidings between any pair of adjacent stations is five. The greatest distance between two crossing points, either station or unattended siding, is 11 miles, and the shortest 4 miles, the average being 8 miles. On the Wankie Livingstone section with a similar traffic density (six trains per day each way), the greatest distance between stations is 38 miles and the shortest 6 miles, the average being 28 miles. The greatest distance between crossing points (either station or unattended siding) is 13 miles and the shortest 5 miles, the average being 7 miles.

Traffic is mainly worked by means of telegraph orders, and crossings are effected at both stations with resident staff and at unattended crossing loop sidings. Only three different kinds of telegraph order are employed, namely, a ‘through’ order, a ‘crossing’ order (which may show up to four or Rye crossings between stations), and a ‘ballast’ order. These orders are actual telegrams received from the next station, and are handed to the drivers and guards of trains without being rewritten. No signatures are received for them, and they serve as authority for the train movements to the next telegraph station and cover all intermediate crossings and passings, &c., which have to be effected en route.

Webb & Thompson’s electric miniature staff working is in force between Beira and Dondo Junction (18 miles), at which point the Trans-Zambesia Railway connects with the Rhodesian system. Intermediate crossing and unattended junction electric staff working is employed on this section. Arrangements are now being made to instal Tyer’s electric key token system on two short sections of the Wankie-Livingstone line.

As ton-mile statistics are not kept for the Vryburg-Bulawayo section, any study of the figures in which this factor of efficiency is used must necessarily be confined to the sections north of Bulawayo. Complete operating statistics for each of those sections are also compiled in the Chief Superintendent’s office at Bulawayo, giving figures for tractive, gross and net ton-mileage, the various relations between them and the train engine-hours, together with average train loads, and train-mileage in relation to train engine-hours. The following were the condensed operating results for the financial year ended September 30, 1926:
Gross ton-miles per train engine-hour 5,631  
Net ton-miles per train engine-hour 2,612  
Train miles per train engine-hour 13  
Average load of trains, gross 426  
Average net load of trains in direction of traffic 66%  
Average load of trains, net 196  
Average load of vehicles (loaded trucks only) 25

Below will be found a few of the outstanding results of the 1926 years working: –

<table>
<thead>
<tr>
<th>Description</th>
<th>Per cent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>An increase in gross receipts of</td>
<td>£271,073  = 6.82</td>
</tr>
<tr>
<td>An increase in gross operating expenditure of</td>
<td>£358,348  = 16.46</td>
</tr>
<tr>
<td>A decrease in net operating revenue of</td>
<td>£87,275   = 4.85</td>
</tr>
<tr>
<td>An increase in the operating ratio from</td>
<td>54.73 to 59.67</td>
</tr>
<tr>
<td>An increase in train-mileage of</td>
<td>388,607   = 9.30</td>
</tr>
<tr>
<td>An increase in earnings per train-mile of approx.</td>
<td>5.19d.    = 2.27</td>
</tr>
<tr>
<td>An increase in expenditure per train-mile of approx.</td>
<td>8.19d.    = 6.55</td>
</tr>
<tr>
<td>An increase in the total net ton-mileage for all sections north of Bulawayo (no figures available for the Vryburg-Bulawayo Section)</td>
<td>27,804,051 = 3.94</td>
</tr>
</tbody>
</table>
The Port of Beira.

The port of Beira is situated 374 miles from Salisbury and 671 miles from Bulawayo. It is accordingly the nearest and natural outlet for Rhodesia to obtain the most economical results. To show the expansion of the port of Beira, the following approximate figures are given showing the tonnage handled during the year:

<table>
<thead>
<tr>
<th>Year</th>
<th>Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1913</td>
<td>297,000</td>
</tr>
<tr>
<td>1923</td>
<td>507,000</td>
</tr>
<tr>
<td>1924</td>
<td>612,000</td>
</tr>
<tr>
<td>1925</td>
<td>646,000</td>
</tr>
<tr>
<td>1926</td>
<td>933,000</td>
</tr>
</tbody>
</table>

Beira serves, apart from the Mozambique territory and Rhodesia, the Congo and Nyasaland. These countries have made marked progress during the past ten years, and it is believed that the resources now proved are capable of much greater and more rapid expansion in the future, provided facilities at the port of Beira are developed to meet requirements. Beira is purely a lighterage port; ships lie in the main stream of the river, while the lighter wharves are situated on both sides of the Chiveve Creek. The rise and fall of the tide is approximately 20 ft., and the ebb tide runs, at its maximum, at about 5 knots. At ordinary high tide ships drawing 24 ft. can enter the port, but those of greater draught must wait for spring tides. The anchorage, although a long one, is somewhat constricted, and ships have not much room in which to swing to their anchors. The harbour and the Customs wharf are under the authority of the Mozambique Company and not the railways. The exports and most of the rough import goods pass over the railway wharf.

Goods dealt with at the Customs wharf are sorted and checked there, and those for up-country are trolleyed round by the forwarding agents to the railway goods shed, and until then the railways have nothing to do with them. Hitherto this has been the normal method of dealing with imports, but in the last year this method has changed and imports are being more and more dealt with at the railway wharf. This has been possible owing to provision of transit sheds on a portion of the wharf. The whole wharfage front available is, however, very limited and prejudices an expansion of trade at the port. For this reason arrangements have been made to carry out considerable improvements and extensions. These comprise the addition of another 380 ft. of lighterage wharf equipped with four cranes, and 520 ft. of new deep-sea wharf, alongside which ocean-going vessels can be berthed. These extensions, together with a corresponding increase in marshalling and storage sidings at the back of the port area, are estimated to increase the capacity of the port by over 60 per cent. This work is being carried out by a new company formed for the purpose, named the Beira Works Limited,
receiving its powers through a Portuguese company which has obtained the necessary concessions from the Portuguese Government.

The Beira Works Company is also at present busily engaged in dredging, with new equipment, the roadstead in the Pungwe River just outside the wharf, and in deepening the channels, as well as dredging in front of the present railway wharves. The water here is very shallow and consequently the lighters are aground for three or four hours at low tide. At present the railways have a wharfage of 905 ft. and 94,980 sq. ft. of warehouse area. On the wharf are 11 steam cranes of modern design, and the lay-out of the lines to serve the wharves is of a satisfactory type. The rate of handling the different commodities varies. With maize one crane can handle about 300 tons in eight hours; with copper about 250; and with chrome ore about 400.

Under the recent arrangement made with the Beira Works Company, that company has taken over certain wharf and railway facilities within the port area, but arrangements will be made to secure continuity of method, for the railways to work all traffic on shore in close association with the new company.

**Stores, Catering, Medical, &c.**

The Stores Department has its principal depot at Umtali, and it is noted from the report for 1926 that during the year the store, and materials imported from oversea represented £348,106, while those purchased locally cost £289,447. An increase in this latter item over the previous year was shown of £89,729, this principally being accounted for by food for natives, wooden sleepers, and by purchases of certain urgent stores due to the floods on the Beira line holding up supplies in the port. A Purchasing Board holds regular monthly meetings to consider requirements.

Another important department on such a widespread system is that charged with the catering arrangements. In 1926 the department earned a profit of £14,056, and during the year served 222,372 meals, facilities being provided both on the trains and at refreshment rooms. The working of the dining cars (on the turnover) showed a profit of £2,476, the number of meals served being 66,952.

The Medical Department, too, has most important work to perform on a system running through tropical and sub-tropical countries. Much depends upon the incidence of the weather, and as to how far it has been possible to provide the most hygienic conditions, Great care is necessarily taken to supervise the health of the employees, and a principal medical officer with assistants are constantly working on these lines. A recent appointment was that of Inspector of Natives, whose work, it is stated, has proved of great value to the medical officers.
Need for Zambesi Bridge.

As shown in the articles on pages 95–99 there is urgent need for a bridge over the River Zambesi, in order to link up railway communications between Nyasaland and the Port of Beira. Sir William Himbury, Managing Director of the British Cotton-growing Association, in his report on the future of cotton-growing in the Union of South Africa, deals with the question of traffic congestion on the Zambesi, and observes:

After personal inspection of the river here, of the sheds and goods awaiting transit, after obtaining figures and statistics of the quantity dealt with, one is forced to come to the conclusion that the present system is quite impossible. A bridge is necessary. With the construction of a bridge the railway from Blantyre must be pushed northwards towards the Lake, and, if necessary, eventually to Fort Jameson.

Nyasaland, from an agricultural point of view, is, for its size, one of the most interesting colonies in Eastern Africa, its real limitations being its small size and its cramped transport facilities.

THE SHIRE HIGHLANDS RAILWAY.

A line 113 miles long, and located in the Nyasaland Protectorate, this railway is operated in conjunction with the Central Africa and Trans-Zambesia Railways, the supervising personnel covering the three railways.

The Shire Highlands Railway extends from Blantyre to Port Herald – a distance of 113 miles – and has its headquarters at Limbe. Like many other railways of South and East Africa, it is of 3-ft. 6-in. gauge. The line from Blantyre to Chiromo was constructed by private capital under a contract with the Nyasaland Government, dated December 31, 1902, and from Chiromo to Port Herald under a further contract, dated February 11, 1908. The railway was opened for traffic in 1909.

The railway passes through very mountainous country, and from Sankulani to Limbe – about 66 miles – there are curves as sharp as 16 degrees, with an adverse ruling gradient of 1 in 44. This section contains some 500 curves, representing about 30 miles in length, or nearly 50 per cent. of the total mileage. Such curves and gradients naturally reduce the speed of trains, and also limit the load. The speed restriction on up trains is 35 miles an hour between Port Herald and Chiromo, 18 miles an hour from Chiromo to Limbe, and 15 miles an hour from Limbe to Blantyre; while on down trains it is 18 miles an hour from Blantyre to Limbe, 20 miles an hour Limbe to Mikalongwe, 18 Mikalongwe to Chiromo, and 35 from Chiromo to Port Herald. Seasonal wash-outs affect the first 12 miles of the railway from Port Herald, and are a great hindrance to traffic.
Permanent Way.

The permanent way consists of 41 ¼-lb. rails on 76-lb. steel sleepers, and is stone ballasted. There are eight stations on the railway and two, train-crossing loops, viz.:–

<table>
<thead>
<tr>
<th>Mileage</th>
<th>Station or Siding</th>
<th>Distance Apart</th>
<th>Line Clear Block Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>Port Herald</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>30</td>
<td>Chiromo</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>41</td>
<td>Sankulani</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>62</td>
<td>Sandama</td>
<td>11½</td>
<td>18</td>
</tr>
<tr>
<td>73½</td>
<td>Konjeni Siding</td>
<td>6½</td>
<td>13</td>
</tr>
<tr>
<td>80</td>
<td>Luchenza</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>93</td>
<td>Mikalongwe</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>107</td>
<td>Limbe</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>113</td>
<td>Blantyre</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

The stations are equipped with Morse telegraph instruments, but there is no signalling in operation. Trains are worked under the absolute block system, by means of line clear orders and such special instructions as may be issued in connection with the running of any particular train. The rolling-stock owned by the Shire Highlands Railway consists of 8 locomotives (2 of which are on loan to the Trans-Zambesia Railway), 1 motor trolley, 13 passenger coaches and 50 wagons. The Shire Highlands Railway is, however, the working company for the Central Africa Railway, and has the use of that company's rolling-stock.

Locomotive and Carriage and Wagon Workshops.

The locomotive repair shops, which deal with repairs to the stock of the Shire Highlands and Central Africa Railways, are situated at Limbe, as also are the running shed and the carriage and wagon shops. They consist of a small erecting shop, with one pit, a machine shop, a smith's shop, a small brass foundry, a power house, a carriage and wagon machine shop, and a large open shed where repairs to carriage stock are carried out. A paint shop is in course of erection. The average miles run between overhaul by engines of the two railways in 1928 was in the neighbourhood of 60,000. Prior to 1926, wood fuel was used on Shire Highlands locomotives, but, owing to the difficulty of obtaining supplies, and also to its increased cost, coal was introduced in that year to supplement wood, the engines being gradually converted to coal-burning. From the following mileage figures it will be observed that some 40,000 miles per annum were run by trains conveying supplies of fuel:–
Miles. 1925. 1926.
Train 47,465 68,924
Light 1,658 1,491
Shunting* 2,562 4,651
Ballast 8,217 3,737
Fuel 38,297 41,023
Pay and stores 2,906 2,164
Total 101,105 121,990

Passenger and Goods Traffic.

There are two passenger trains each way weekly, one conveying mails and passengers at full fares, and the other passengers at half-fares. The average number of trains per week is 30, of which about eight are fuel trains and two pay-trains, and, therefore, non-revenue /

[...]

earning. The control of trains is in the hands of a controller at Limbe, who works directly under the orders of the Traffic Superintendent. He is responsible for arranging out-of-course crossings, movements of fuel or ballast trains, the requisitioning of engine power and the distribution of wagons. With such a small traffic comprehensive statistics are not maintained, but these will, no doubt, be introduced at a later date.

Particulars of the traffic dealt with during the last three years are set out below:

<table>
<thead>
<tr>
<th>Year</th>
<th>First class No.</th>
<th>Second class No.</th>
<th>Third class No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1924</td>
<td>1,963</td>
<td>825</td>
<td>26,804</td>
</tr>
<tr>
<td>1925</td>
<td>2,015</td>
<td>587</td>
<td>35,713</td>
</tr>
<tr>
<td>1926</td>
<td>2,264</td>
<td>510</td>
<td>46,817</td>
</tr>
<tr>
<td>Total</td>
<td>29,804</td>
<td>38,315</td>
<td>49,591</td>
</tr>
</tbody>
</table>

Goods Traffic. Tons.†

<table>
<thead>
<tr>
<th>Item</th>
<th>1924</th>
<th>1925</th>
<th>1926</th>
</tr>
</thead>
<tbody>
<tr>
<td>General merchandise</td>
<td>11,046</td>
<td>12,804</td>
<td>16,667</td>
</tr>
<tr>
<td>Maize</td>
<td>1,435</td>
<td>1,391</td>
<td>3,585</td>
</tr>
<tr>
<td>Sisal and sisal leaf</td>
<td>3,542</td>
<td>5,643</td>
<td>582</td>
</tr>
<tr>
<td>Tobacco</td>
<td>4,643</td>
<td>4,690</td>
<td>6,229</td>
</tr>
<tr>
<td>Cotton and cotton seeds</td>
<td>1,866</td>
<td>1,606</td>
<td>1,457</td>
</tr>
<tr>
<td>Tea</td>
<td>608</td>
<td>770</td>
<td>674</td>
</tr>
<tr>
<td>Various</td>
<td>3,142</td>
<td>2,473</td>
<td>2,849</td>
</tr>
<tr>
<td>Total</td>
<td>26,282</td>
<td>29,377</td>
<td>32,043</td>
</tr>
</tbody>
</table>

The Nyasaland Government has the right to purchase the Shire Highlands Railway, rolling-stock and equipment at any time after 25 years from the date the line was opened for traffic. This right can be exercised in 1934.

* Calculated on basis of 10 m.p.h.
† Short ton of 2,000 lb.
Rates and Fares.

Rates and fares are high when compared with other railways. This is mainly due to the small traffic conveyed, but, with the future development of Nyasaland, it may be possible to effect certain reductions. The cost of working a railway of such a mountainous character is also a factor. Details are set out below:–

**Passenger Fares.**

First class, 6d. per mile. Second class, 2¼d. per mile. Third class ¾d. per mile.

<table>
<thead>
<tr>
<th>Class</th>
<th>Principal Commodities</th>
<th>Rate per Ton-Mile</th>
<th>Terminal Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drapery, furniture</td>
<td>18.75</td>
<td>5 4¼</td>
</tr>
<tr>
<td>2</td>
<td>Groceries, hardware</td>
<td>12.25</td>
<td>5 4¼</td>
</tr>
<tr>
<td>3</td>
<td>Iron and steel</td>
<td>9.37</td>
<td>5 4¼</td>
</tr>
<tr>
<td>4</td>
<td>Imported lime, oil cakes</td>
<td>3.50</td>
<td>5 4¼</td>
</tr>
<tr>
<td>5</td>
<td>Seeds</td>
<td>1.75</td>
<td>2 8</td>
</tr>
<tr>
<td>5A</td>
<td>Fertilisers</td>
<td>1.00</td>
<td>–</td>
</tr>
</tbody>
</table>

**Export.**

A Tobacco in bales, cotton in bales 5.62 5 4¼  
B Sisal 2.00 5 4¼  
C Ivory 16.00 –  
D Strophanthus* 9.37 –  
E Rubber (raw), tea 5.62 5 4¼  
F Tobacco in casks or cases 5.75 7 2 /

*Calculated on basis of 10 m.p.h.

**THE TRANS-ZAMBESIA RAILWAY.**

This line is 157 miles long on the 3-ft. 6-in. gauge and extends from Dondo, Beira & Mashonaland & Rhodesia Railways, to Murraca on the River Zambesi, connecting by Ferry Service with the Central Africa Railway.

The Trans-Zambesia Railway runs through territory held and administered by the Mozambique Company under charter granted by the Portuguese Government. The first concession for constructing the railway was granted by the Mozambique Company in April, 1898, and was transferred to a Belgian Company (the Compagnie du Chemin de Fer de Beira au Zambese) in October, 1912. Difficulties arose in connection with the financing of the construction of the railway, and in August, 1919, a conditional contract was entered into between representatives of the Belgian company and the Crown Agents for the Colonies, acting on behalf of the Nyasaland Government, under which a railway company was to be incorporated in England – with the approval of the Mozambique Company and the Portuguese Government – to acquire the rights of the Belgian Company to construct and work the proposed railway.
The Trans-Zambesia Railway Co. Ltd. was incorporated in England in December, 1919, with power to issue 6 per cent. debentures up to £1,200,000, redeemable by an annual sinking fund in 25 years, commencing five years after the first issue, the whole to be redeemed within 45 years. The Nyasaland Government guaranteed the interest of the debentures for 25 years from date of issue – the company to repay all sums advanced with interest at 5 per cent. – the maximum annual payment to be limited to £72,000 in respect of interest and £30,000 in respect of sinking fund. The Nyasaland Government was allotted 150,000 fully-paid ordinary shares of the 600,000 issued, and have the right to be represented by a Director on the Board, while the Mozambique Company was allotted 200,000 ordinary shares with the right to appoint the Chairman and half the Directors of the Board.

In order to provide further working capital, £200,000 10-year guaranteed notes at 5½ per cent. were issued in August, 1923, to be redeemed at par in 1933, the interest and principal being guaranteed by the Nyasaland Government.

The railway was constructed by contract from Dondo (junction with the Beira & Mashonaland & Rhodesia Railways) – on the Beira Junction Railway, 18 miles from Beira – to Murraca on the south bank of the Zambesi, and was opened for traffic on July 1, 1922.

The distance from Murraca to Dondo is 157 miles, and the Trans-Zambesia Railway has running powers over the Beira Junction Railway for the remaining 18 miles to Beira.

There are three stations – exclusive of Dondo, which is on the Beira Junction Railway – and four crossing places, viz.:

<table>
<thead>
<tr>
<th>Mileage</th>
<th>Station or Siding</th>
<th>Distance Apart</th>
<th>Line Clear Block Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Dondo</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Mafra Siding</td>
<td>19½</td>
<td>99</td>
</tr>
<tr>
<td>49½</td>
<td>Luso Siding</td>
<td>20 ½</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>Beja Siding</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>99</td>
<td>Inhamatinga</td>
<td>15</td>
<td>47</td>
</tr>
<tr>
<td>114</td>
<td>Inhamatinga Siding</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>146</td>
<td>Caia</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>157</td>
<td>Murraca</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Permanent Way and Signalling.

The railway is laid with 60-lb. rails, with 70-lb. steel sleepers for most of its length. Originally, some 24 miles were laid with local wooden sleepers, but these were found to be unsuitable, and in due course will be relaid with steel sleepers. No ballast has been used, the sleepers being packed with sandy earth taken from alongside the formation.
The ruling gradient is 1 in 80. In the rainy season the Zambesi encroaches over its right bank and seriously affects the line between Caia and Murraca, Murraca station yard being at times under water.

Stations are equipped with Morse telegraph instruments and Murraca is connected with Chindio, on the Central Africa Railway, by means of a twin marine cable 2 miles long. No signalling or interlocking is in operation, trains being worked under the absolute block system with line-clear orders. The control of trains is in the hands of the Traffic Superintendent at Beira.

Locomotives and Boiling-Stock.

The Trans-Zambesia Railway owns 6 locomotives, 2 motor trolleys, 14 carriages, 126 wagons and 1 breakdown crane. There are also two engines on hire from the Shire Highlands Railway. Repairs to rolling-stock are undertaken at Murraca, where there is an open shed, capable of holding one engine, and which does duty as a running shed. The locomotive depot will shortly be removed to Inhamatanga, where a well-equipped running shed is being erected.

Wood fuel exclusively is used on engines. The productive and non-productive mileage run in 1925 and 1926 is set out below:

<table>
<thead>
<tr>
<th>Miles.</th>
<th>1925</th>
<th>1926</th>
</tr>
</thead>
<tbody>
<tr>
<td>Train</td>
<td>37,520</td>
<td>48,695</td>
</tr>
<tr>
<td>Light</td>
<td>212</td>
<td>800</td>
</tr>
<tr>
<td>Shunting*</td>
<td>28,851</td>
<td>43,209</td>
</tr>
<tr>
<td>Ballast</td>
<td>3,818</td>
<td>5,922</td>
</tr>
<tr>
<td>Fuel</td>
<td>5,433</td>
<td>5,912</td>
</tr>
<tr>
<td>Pay and stores</td>
<td>2,767</td>
<td>3,631</td>
</tr>
<tr>
<td>Total</td>
<td>78,601</td>
<td>108,169</td>
</tr>
</tbody>
</table>

Passenger and Goods Traffic.

Particulars of the traffic dealt with during the last three years are set out here under:

<table>
<thead>
<tr>
<th>Passengers.</th>
<th>1924</th>
<th>1925</th>
<th>1926</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>No.</td>
<td>No.</td>
<td></td>
</tr>
<tr>
<td>First class</td>
<td>2,062</td>
<td>2,015</td>
<td>2,249</td>
</tr>
<tr>
<td>Second class</td>
<td>583</td>
<td>420</td>
<td>543</td>
</tr>
<tr>
<td>Third class</td>
<td>7,791</td>
<td>8,305</td>
<td>9,037</td>
</tr>
<tr>
<td>Total</td>
<td>10,616</td>
<td>10,740</td>
<td>11,829</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Goods Traffic</th>
<th>1924</th>
<th>1925</th>
<th>1926</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tons.</td>
<td>Tons.</td>
<td>Tons.</td>
<td></td>
</tr>
<tr>
<td>General merchandise</td>
<td>9,360</td>
<td>13,050</td>
<td>16,821</td>
</tr>
<tr>
<td>Maize</td>
<td>349</td>
<td>101</td>
<td>3,011</td>
</tr>
<tr>
<td>Tobacco</td>
<td>4,330</td>
<td>4,302</td>
<td>5,709</td>
</tr>
<tr>
<td>Cotton</td>
<td>1,706</td>
<td>1,795</td>
<td>1,958</td>
</tr>
</tbody>
</table>

* Divisible between trans-Zambesia Railway and Beira & Mashonaland &Rhodesia Railways.
Anon., ‘The Railways of Africa’

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tons.</td>
<td>Tons.</td>
<td>Tons.</td>
<td></td>
</tr>
<tr>
<td>Sisal</td>
<td>1,532</td>
<td>1,837</td>
<td>1,900</td>
</tr>
<tr>
<td>Tea</td>
<td>599</td>
<td>759</td>
<td>673</td>
</tr>
<tr>
<td>Sugar</td>
<td>22,027</td>
<td>4,447</td>
<td>16,010</td>
</tr>
<tr>
<td>Various</td>
<td>1,361</td>
<td>2,006</td>
<td>2,299</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>41,264</td>
<td>28,297</td>
<td>48,381</td>
</tr>
</tbody>
</table>

The decrease in traffic in 1925 was due to failure of the sugar crop.

The passenger fares from Muracca to Dondo are 6d. per mile 1st class, 4d. per mile 2nd class, and 1½d. per mile 3rd class. On the Beira Junction Railway from Dondo to Beira they are slightly lower.

Goods rates are set out below:–

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Terminal Charge. Rate per Ton-Mile.† Rate per Ton-Mile.†</td>
<td></td>
</tr>
<tr>
<td></td>
<td>s. d. d. d.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>6 8 11.2 10.2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>6 8 8.5 7.2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>6 8 6.5 5.5</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>6 8 5.2 4.4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>– 3.4 3.3</td>
<td></td>
</tr>
<tr>
<td>5A</td>
<td>– 1.75 2.7</td>
<td></td>
</tr>
<tr>
<td>5B</td>
<td>– 1.0 2.4</td>
<td></td>
</tr>
<tr>
<td>Export</td>
<td>A – 4.5 4.0</td>
<td></td>
</tr>
<tr>
<td>&quot;</td>
<td>B – 2.5 2.0</td>
<td></td>
</tr>
<tr>
<td>&quot;</td>
<td>C 6 8 11.2 10.0</td>
<td></td>
</tr>
<tr>
<td>&quot;</td>
<td>D 6 8 6.5 5.5</td>
<td></td>
</tr>
<tr>
<td>&quot;</td>
<td>E – 4.5 4.4</td>
<td></td>
</tr>
<tr>
<td>&quot;</td>
<td>F – 5.3 4.0</td>
<td></td>
</tr>
</tbody>
</table>

The concession to the Trans-Zambesia Railway Co. Ltd. is in force for a period of 99 years from November 4, 1919, after which the railway reverts to the Portuguese Government. The Mozambique Company has the right to repurchase the concession at any time after 20 years from November 4, 1919.

Ferry Service.

From Muracca on the Trans-Zambesia Railway to Chindio on the Central Africa Railway – about two miles distant – traffic is conveyed across the Zambesia River by means of a ferry service, the property of the Trans-Zambesia Railway.

Shallow draught stern wheel steamers, with limited passenger accommodation, are utilised, and barges – attached one on each side of the steamer – convey the goods traffic. It is not possible for wagons to be taken across the river, and merchandise has to be unloaded, sorted and checked on either bank before tran-

* Short ton of 2,000 lb.
† Short ton of 2,000 lb.
shipment between wagon and *vice versa*. Goods in transit have to be passed by the Portuguese Customs on both sides of the river.

The full load of the barges is 30 tons each, or 60 tons a trip, and the time taken in loading averages about 1½ hours. Customs Manifest and Clearance occupy about one hour; crossing the river, casting loose barges, &c., 1½ hours, and unloading one hour, in all, say, five hours, the round trip being performed in about 10 hours. Owing to floods during the rainy season and to the shallowness of the river and the numerous sandbanks during the dry season, full loads can be conveyed for about four months only during the year. From January to April there is the possibility of goods traffic being held up altogether owing to floods; from May to August the river is at its best from the ferry point of view, but from September to the end of the year the river becomes very shallow and loads have to be reduced from 60 tons per trip to as low as 15 tons.

There is the further factor that the Zambesia is apt to change its channel and it is not possible to maintain permanent sites on its banks as terminals. For this reason a train ferry would not be practicable.

**THE TANGANYIKA RAILWAYS.**

This Government System exceeds 1,000 miles in length, and comprises two detached main lines. Sisal, Ground-nuts and Copper are the Principal Items of Freight Traffic.

TANGANYIKA Territory, on the East Coast of Africa, comprises an area of some 365,000 square miles and is, therefore, three times, as big as the United Kingdom and almost equal to the area of Kenya, Uganda and Nyasaland added together. The population exceeds 4,000,000, and mainly comprises tribes of mixed Bantu race. The railway system, which was taken over from the Germans during the Great War, now extends for a little over 1,000 miles in length and is on the metre gauge. There are two detached single-line railways running out from the coast: the Central Railway runs from Dar-es-Salaam (the capital) to Kigoma on Lake Tanganyika, with a branch from Tabora to Mwanza on Lake Victoria Nyanza, and is 1,244 km. (772½ miles) long. A second main line of 353 km. (219 miles) in length leaves the coast at Tanga, and has been extended beyond Moshi to Arushi on the Sanya River. A line called the Sanya River branch runs out from a point near Moshi, while the Voi-Kahe Railway (92 miles long) runs out to Voi in Kenya Colony, and is now worked as part of the Kenya & Uganda Railway. A line of 64 miles in length towards Tabora has been developed from Mwanza, but was not opened for traffic at the end of the last financial year. Additionally, there is a narrow gauge line in the southern coastal region of the territory called the Lindi Tramway. Marine services are worked on Lakes Victoria Nyanza and Tanganyika.
The total capital cost of the railways up to March 31, 1926, was £5,914,490, nearly £5,000,000 of this amount having been expended on the Central Railway. During the year 1925–26, £297,210 additional capital was spent on the Central Railway, while £52,935 was disbursed on account of the Tanga Railway. Improved results were shown on the working of the railways for the financial year 1925–26, as compared with the previous year. Net revenue for 1925–26 was £388,118 the previous year, while expenditure was £391,276 against £354,965 in 1924–25. As a result, the operating ratio in 1925–26 was 100.80 per cent. as compared with 106.56 per cent. in the of the earnings, the Central line receiving 80.33 per cent. of its net revenue from this source and the Tanga Railway 51.73 per cent. Corresponding percentages for coaching traffic on the two lines were 17.73 and 42.91 respectively. On the expenditure side, locomotive, carriage and wagon expenses accounted for 39.07 per cent. in 1925–26, maintenance of way and works 24.23 per cent., and traffic charges 12.72 per cent. Owing to the deficiency in working the Imperial Treasury has had to remit certain sums to the Territory. In 1919–20 and 1920–21 large free grants were made, but since then repayable loans have been advances, and the total of these now amounts to close on £1,000,000. Deficits on working were an annual occurrence until 1924–5, when for the first time the Central Railway showed a profit which has been increased for 1925–26. In the last financial year a profit on the working of the combined railways was made for the first time.

The railways are organised on a departmental basis, the General Manager, Col. G. A. P. Maxwell, being in control of six separate departments – Engineering, Locomotive, Traffic, Marine, Accounts and Stores – with headquarters at Dar-es-Salaam. The Department of the Port and Marine was absorbed into the railways on November 1, 1925. The work on the wharves was handed over to the Traffic Department, the cranes and dockyard to the Chief Mechanical Engineer’s Department, and the Director of Port and Marine became the Marine Superintendent of the Railway Department. The Engineering Department is subdivided into three districts, two on the Central and one on the Northern Railway. The first district extends from Dar-es-Salaam to Itigi, with headquarters at the former place. The second district extends from itigi to Kigoma with headquarters at Tabora, and the third district extends from Tanga to Moshi, inclusive of the Sanya branch, with headquarters at Tanga. The Chief Mechanical Engineer is assisted by district officers, and has, as an independent supervisor, a Locomotive Running Superintendent.

The total staff employed on March 31, 1926, was 8,513, 182 of these being Europeans, 108 Goans, 674 Indians and 7,549 Africans. The Engineering Department accounts for 4,522 of this total, and the Locomotive Department 2,384, the Traffic Department employing 700 persons.
Permanent Way and Works.

The track mileage maintained on the Tanganyika Railways amounts to 1,127 miles. The number of maintenance sections at the end of the last financial year was 16, their average length being 100 km., with a maximum length of 116 km. and a minimum length of 80 km. On the Central Railway 1.28 track men were employed per kilometer, and on the Northern line 1.15 men per kilometre, including sidings, this representing an average of 1.19 men per km. being laid over easier country, which should make for rapid progress. One of the great troubles has been to obtain sufficient labour, and the contractors have had to resort to the importation of Liberians, Hindu coolies and West Africans.

The rails weigh 30 kg. per metre. The maximum gradient is 2½ per cent. and the minimum radius of curves 120 m. between Lengue and Sao Pedro there is a rack section of the ‘Riggenbach’ type, with gradients of 1 in 16. The line follows a ledge of rock and crosses the canyon three times. The first bridge has five spans and masonry piers, the second on has one span of 138 ft. in length at a height of 60 ft. and the third has four 60 ft. spans.

The rolling-stock comprises 35 locomotives, four rack locomotives, 20 carriages, 293 freight vehicles and rail motor cars.

The Mossamedes Railway.

This railway runs from Mossamedes to the south of the colony, and extends to Lubango on the Chella plateau, a distance of 155 miles, an extension being now in progress through Huila. The line is laid to the 60-cm. gauge. The southern portion of Angola has been difficult to pacify, and one of the reasons for the building of the line was the facility offered for troop transportation to the foot of the Chella plateau, some 100 miles inland. Additionally, the line opens up a region capable of easy colonisation. A Royal Decree of 1905 authorised the railway, and by the end of the following year some 40 miles were open for traffic. A further 25 miles was constructed in accordance with a Decree of 1907, and on the outbreak of war about 100 miles were in service. The southern portion of Angola is the natural outlet for the Otavi district, which is situated in ex-German South-West Africa, and an extension of the railway to Otavi has been projected.

THE RAILWAY OF MAURITIUS.

The island of Mauritius, a British possession, which is about 36 mile in length and 28 in breadth, contains an area of approximately 720 square miles and an estimated population of about 400,000. The railway system which [...] serves a great deal of the island, comprises 120 miles of 4 ft 8½ in. gauge line and 24 miles of 2
ft. 6 in. gauge line. The working results for 1924, the latest figures available, show railway receipts Rs. 5,124,641, including work done for Government departments, and expenditure, excluding charge on debt Rs. 5,183,158. The railways are under Government control and are divided into four systems.

The Midland, which is the main line, runs from Port Louis, the capital, to Mahebourg, via Curepipe, and has to climb to a height of 1,800 ft. and descend to sea level in the Grand River on a fine 5-span bridge, and subsequently has to negotiate many severe gradients, 1 in 50 being frequent, while there is one of 1 in 27 between Petite River and Beau Bassin. At Rose Belle a 10½-mile branch runs south to Souillog on the coast, this carrying a large passenger and sugar-cane traffic from the Savanne district.

The North line extends for 31 miles and runs in a semi-circular direction from Port Louis to Grand River S. E. through fairly level country almost entirely devoted to the production of sugar cane. A short branch, 3¼ miles in length, runs out from Terrerouge to Long Mountain. The Moka Flacq line, which branches off the main line at Rose Hill, runs almost due east for 25¾ miles and joins the southern portion of the northern line at Riviere Seche. The remaining line to Black River leaves the main line at Riviere Seche. The remaining line to Black River leaves the main line at Richelieu Junction line runs south through Tamarin.

The lines are all being passing place at nearly every station. The higher grade railway officials are Europeans, but the stationmasters are Creoles, as are also the guards, while the porters are chiefly natives. The railway workshops are at Plaine Lausanne, 1½ miles from Port Louis on the Midland line.

The rolling-stock comprises 51 locomotives, 200 passenger carriages and 874 freight vehicles for the 4 ft. 8½ in. gauge, and 3 locomotives, 1 carriage and 168 freight vehicles for the 2 ft. 6 in. gauge. The majority of the stock is four-wheeled, but there are a few 8-wheeled bogie wagons in service. There are no special engineering features on the line, except for the one or two bridges noted, the line being laid more or less on the natural surface of the ground.
It is an interesting fact that the vast Continent of Africa, except for a few comparatively small areas, has been developed solely by various European Powers, and that by far the major portion of the country is still subject to their control. This differentiates Africa from the other Continents, and has doubtless been a factor of great importance in connection with transportation developments. Great Britain and France are principally concerned, as each country is directly interested in territories having an aggregate area much larger than Europe, and may, therefore, be said to control two-thirds of the total area (11,500,000 square miles) of the Continent. Belgium, Portugal, Italy and Spain are also involved, so there is ample scope for railway questions to become interwoven with politics of an international character. Except for Great Britain, however, the interests of the different nations are sharply defined from each other. The British Possessions are widely scattered, east, west and south, while Belgium is interested solely in the Congo, Portugal with Angola and Mozambique, and Spain with relatively small areas. France, however, virtually monopolises the whole of Northern Africa, and the greater part of West and Equatorial Africa, Italy controlling Libya, Eritrea and a slice of Somaliland.

[...]

<table>
<thead>
<tr>
<th>Country</th>
<th>Area.</th>
<th>Population.</th>
<th>Railway Mileage.</th>
<th>Miles of Railway per 100 sq. miles.</th>
<th>Miles of Railway per 10,000 inhabitants.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>11,500,000</td>
<td>143,000,000</td>
<td>38,000</td>
<td>0.33</td>
<td>2.66</td>
</tr>
<tr>
<td>South America</td>
<td>7,250,000</td>
<td>70,000,000</td>
<td>57,000</td>
<td>0.79</td>
<td>8.14</td>
</tr>
<tr>
<td>Australia</td>
<td>2,974,581</td>
<td>6,000,000</td>
<td>27,000</td>
<td>0.90</td>
<td>45</td>
</tr>
</tbody>
</table>

On an equal basis for miles of railway per 100 square miles of area as this country, Africa would require to have more than three times the present total for the world! Such a comparison – unfair though it is – clearly shows the great difference...
in the conditions. A contrast with other new countries, such as South America and Australia, is, perhaps, more illuminating, and is given in the above table.

[...]

It has not been a simple task to compile the table, as even where information was available there were disturbing discrepancies to be investigated, but we believe that the figures now presented are accurate within measurable limits. They show that the principal gauge in use is the 3 ft. 6 in. with 20,825 miles, the next the metre with 8,694 miles, and the third, 4 ft. 8 1/2 in., with 4,232, a somewhat similar mileage being divided between the 2 ft. 6 in. and 2 ft. gauges. It is rather unfortunate that there should be two gauges with a difference of only a little over 2 in. in width, more especially as several of the metre-gauge lines will inevitably be linked up with the more rapidly developing 3 ft. 6 in., but in all probability conversion can be made without much inconvenience or expense on the metre-gauge sections of line concerned. In this connection it may be added that as some of the metre-gauge lines in the Belgian Congo are being extended, opportunity is being taken of widening the existing lines to the 3 ft. 6 in. gauge.

As in all new countries, the railways of Africa first developed as long single lines running out into the interior from suitable bases on the coast, this tendency being clearly illustrated in our map. Then branches were added to the main line, and as traffic developed following the provision of railway facilities came the need for connecting the disconnected lines. That, broadly, is the position in Africa to-day. In the north and south a great deal has been done, but both east, west and centre the lines are extremely localised, and a large mileage of new railway will be required to bridge the gaps. Transcontinental connections so far are lacking – except for the east-west route in South Africa – but steps are now in progress for this defect to be remedied, as noted in a separate editorial.

Just as the size of the African systems differs as between the Union of South Africa with 12,624 route-miles and Sierra Leone with 338 miles, so conditions vary between wide limits. In some parts the country is absolute desert, in others of a mountainous character. Some territories are always short of water and others have an abundance through the great rivers. As a result, railway construction is hindered on the one hand by sand and dust storms and on the other owing to the very swampy nature of enormous areas. Then there are great climatic differences, while traffic characteristics in the varying districts also have an influence on railway practice. Quite different methods of working are naturally required in the heavy zones, such as the coalfields of South Africa and Nigeria, the copper region of the Katanga, the manganese district of the Gold Coast, the phosphate areas of Morocco and Tunisia,
Anon., ‘The Railways of Africa’ 211

**Railways of Africa, showing Mileage on Various Gauges.**

<table>
<thead>
<tr>
<th>Territory</th>
<th>Total Mileage</th>
<th>4ft 8 ½ in.</th>
<th>3 ft. 6 in.</th>
<th>Metre.</th>
<th>2 ft. 6 in.</th>
<th>2 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Union of South Africa</td>
<td>12,624</td>
<td>–</td>
<td>11,639</td>
<td>–</td>
<td>–</td>
<td>985</td>
</tr>
<tr>
<td>Algeria</td>
<td>2,873</td>
<td>1,540</td>
<td>920</td>
<td>378</td>
<td>–</td>
<td>35</td>
</tr>
<tr>
<td>Egypt</td>
<td>2,775</td>
<td>1,840</td>
<td>–</td>
<td>155</td>
<td>780</td>
<td>–</td>
</tr>
<tr>
<td>French West Africa*</td>
<td>2,108</td>
<td>–</td>
<td>–</td>
<td>2,108</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
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<td>–</td>
<td>1,870</td>
<td>–</td>
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</tr>
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<td>–</td>
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<td>–</td>
<td>1,728</td>
<td>–</td>
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</tr>
<tr>
<td>Morocco</td>
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<td>1,466</td>
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<tr>
<td>Tunisia</td>
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<td>415</td>
<td>–</td>
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<td>–</td>
<td>940</td>
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<tr>
<td>Kenya and Uganda</td>
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<td>317</td>
<td>–</td>
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</tr>
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<td>Tanyanka</td>
<td>1,128</td>
<td>–</td>
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</tr>
<tr>
<td>Angola</td>
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<tr>
<td>French Equat. Africa</td>
<td>670</td>
<td>–</td>
<td>–</td>
<td>570</td>
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</tr>
<tr>
<td>Mozambique</td>
<td>626</td>
<td>–</td>
<td>566</td>
<td>–</td>
<td>–</td>
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</tr>
<tr>
<td>Gold Coast</td>
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<td>–</td>
<td>490</td>
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<td>10</td>
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</tr>
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<td>Abyssinia</td>
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<td>–</td>
<td>495</td>
<td>–</td>
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<tr>
<td>Madagascar</td>
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<td>–</td>
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<td>–</td>
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<tr>
<td>Italian Zones</td>
<td>405</td>
<td>–</td>
<td>–</td>
<td>405</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Bechuanaland</td>
<td>394</td>
<td>–</td>
<td>394</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>338</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>338</td>
<td>–</td>
</tr>
<tr>
<td>Nyasaland</td>
<td>332</td>
<td>–</td>
<td>332</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Mauritius</td>
<td>144</td>
<td>120</td>
<td>–</td>
<td>–</td>
<td>24</td>
<td>–</td>
</tr>
<tr>
<td>Spanish Zone</td>
<td>140</td>
<td>–</td>
<td>–</td>
<td>75</td>
<td>–</td>
<td>65</td>
</tr>
<tr>
<td>Reunion</td>
<td>80</td>
<td>–</td>
<td>–</td>
<td>80</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Total</td>
<td>37,956</td>
<td>4,232</td>
<td>20,825</td>
<td>8,694</td>
<td>1,535</td>
<td>2,670</td>
</tr>
</tbody>
</table>

Some of the systems have now been developed to a commendable degree of efficiency, especially when viewed from the standpoint of the conditions under which they have to work, and, as we show in our articles, every effort is being made to raise their standard of efficiency. The re-location of lines and the improvement of operating conditions by means of regrading and the flattening of curves go hand in hand with the employment of stronger track materials, more powerful locomotives and high-capacity rolling-stock. Train control is making rapid progress on several systems, while recent investigations have led to the more or less general adoption of a ‘transportation’ scheme of organisation on most lines. The relatively low operating ratios of the railways in British territories show that keen attention is being paid to the financial aspect – which must, of course, be considered in conjunction with the necessity for encouraging national development – and there seems every reason to expect that these and

* * Includes Senegal, Guinea, Ivory Coast, Togo, Dahomey, &c. and the agricultural zones of the Sudan, Tanyanka and other countries, while the prevalence of heavy seasonal traffics with their intensive demands upon railway facilities has also an important bearing upon railway questions in Africa.
other African railways, in the enlarged sphere they will inevitably fill, will prove to be sound assets to the countries they serve. / 

THE SUDAN GOVERNMENT RAILWAYS AND STEAMERS.

The State Administration Controls 1,728 Route-Miles of 3-ft. 6-in. Gauge Line, operates Steamer Services over 2,435 Miles of River, and has recently introduced Mechanical Road Transport in certain localities. Important Developments are pending in each Phase of Activity.

The Sudan Government Railway system, which now comprises close on 2,000 miles of line, owes its inception to the military railway, which was constructed during the Anglo-Egyptian campaign for the re-conquest of the Sudan, in the years 1896–99.

The Sudan is 1,000,000 square miles in area, or over ten times the size of Great Britain, the total native population being approximately 6,000,000. Great tracts of the territory consist of waterless desert, which are practically uninhabited, the occupied productive regions being confined mainly to the valley of the River Nile and its southern tributaries. The country possesses great natural resources, and with the extension of railway facilities and irrigation works, important developments are taking place, notably in connection with the production of cotton, grain, &c., for shipment.

Early Railways.

The first railway project in the Sudan was launched in the ‘seventies, under the auspices of the Khedive Ismail, whose intention was to construct a line along the Nile from Halfa southwards to Khartoum, and ultimately to El Fasha, the capital of the Darfur Province. This scheme was, however, abandoned owing to its expense when some 30 miles had been laid, and railway development in the Sudan was held back for a quarter of a century. In the year 1896, during the Anglo-Egyptian campaign above mentioned, the first advance of the Army was made possible by the extension of this derelict line along the Nile to Kerma, a distance of about 170 miles. The line, however, was subsequently abandoned, and the track was taken up in 1904.

The military railway (576 miles long) constructed by Lord Kitchener to connect Halfa with Khartoum, in the years 1896–99, was really the beginning of the Sudan system of railways. This line, instead of following the course of the River Nile, cut straight across the Halfa Desert. On the successful termination of the campaign in 1900, the military railway and the Egyptian War Department steamers were handed over to the Sudan Government, and administered by the Civil Service. At that time the only means of communication with the
Sudan was via Egypt, by way of the Egyptian State Railways, terminating at Shellal, and thence by Sudan Government Railway steamer service to Halfa. By this route, three transhipments were necessary between Cairo and Khartoum – (1) at Luxor, where the 4-ft. 8 1/2-in. gauge changed to 3-ft. 6-in.; (2) at Shellal, from rail to river steamer; and (3) at Halfa, from river steamer to Sudan Government Railway. One of these transfers has recently been obviated by the conversion of the Egyptian State Railways between Luxor and Shellal from 3-ft. 6-in. to 4-ft. 8 1/2-in. gauge.

Railway Extensions.

In 1905 the Sudan Government Railway was linked up with the Red Sea by a connecting line (304 miles long) from Atbara to Suakin, a small native port, and early in 1906 the section, 18 miles long, northwards from Sallom Junction to Port Sudan, was opened. At Port Sudan a modern harbour was simultaneously constructed. This route provided direct access to the Sudan by means of the steamship lines passing through the Suez Canal and the Red Sea. In 1905, also, a branch line was thrown out from Abu Hamed to Kareima (138 miles), in order to serve the Dongola Province. Four years later, extensions were commenced from Khartoum southwards, reaching Wad Medani (a distance of 108 miles) in 1909, Kosti (a further 127 miles) in 1910, and El Obeid, the present terminus (a further 190 miles), in the following year. In 1914 a short branch line of 4 1/2 miles was built from Sennar to Makwar in connection with the construction of the Sennar Dam. Further railway development was prevented by the war, and since then the only important extension completed has been the Kassala Railway (217 miles) from Haiya Junction, on the Red Sea line, to Kassala. (The construction of this line was described in the April 9, 1926, issue of The Railway Gazette.)

River Services.

Supplementing the railways, and working in close connection with them, are river steamer services between Shellal and Halfa (an important link in the through communication between Egypt and the Sudan); from Kerma to Kareima, serving the Dongola reach of the Nile; and from Khartoum southwards to Rejaf, &c. These services are mentioned later.
It will be seen that the Sudan Government Railways were constructed primarily for strategical reasons, and it may be said that the effective occupation and control of the country are still dependent upon them.

Map of the Sudan Government Railways, showing 1,728 Route-Miles of Line and 2,435 Miles of River Services.

Under British administration the Sudan is developing rapidly, largely due to the means of communication afforded by the railways and steamers, and a considerable traffic has been created. incidentally, the railways and steamers have become the principal source of revenue to the Sudan Government. Important new commercial enterprises are now in course of active development, which will render the further extension of the railway inevitable.

The capital expenditure on the railways, steamers and ancillary services up to December 31, 1926, amounted to approximately 8 1/2 millions sterling. The development of the railway and ancillary services since the year 1913 is illustrated in the tables on pages 15 and 16.

In 1926 the total earnings of the railway section amounted to £E.1,594,827, as compared with £E.516,876 in the year 1913, an increase of 208.5 per cent. Working expenses increased during the same period from £E.396,496 to £E.952,264, or by 140.2 per cent., but there was a very satisfactory reduction

<table>
<thead>
<tr>
<th>Year</th>
<th>Miles of Line</th>
<th>Passengers Carried</th>
<th>Tonnage of Goods</th>
<th>Total Revenue</th>
<th>Working Expenses</th>
<th>Net Profit</th>
<th>Train Mileage</th>
<th>Earnings per Train Mile</th>
<th>Working Expenses per Train Mile</th>
<th>Percentage of Working Expenses to Gross Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1913</td>
<td>1,489</td>
<td>419,681</td>
<td>172,975</td>
<td>516,876</td>
<td>396,496</td>
<td>120,380</td>
<td>1,110,581</td>
<td>9 2.6</td>
<td>7 3.8</td>
<td>76.7</td>
</tr>
<tr>
<td>1914</td>
<td>1,489</td>
<td>382,095</td>
<td>205,775</td>
<td>537,371</td>
<td>387,037</td>
<td>150,334</td>
<td>1,080,541</td>
<td>9 10.1</td>
<td>7 4.1</td>
<td>72.0</td>
</tr>
<tr>
<td>1915</td>
<td>1,489</td>
<td>291,251</td>
<td>223,300</td>
<td>535,805</td>
<td>326,259</td>
<td>188,745</td>
<td>985,229</td>
<td>10 8.6</td>
<td>6 9.5</td>
<td>60.8</td>
</tr>
<tr>
<td>1916</td>
<td>1,489</td>
<td>373,518</td>
<td>252,062</td>
<td>742,474</td>
<td>454,813</td>
<td>287,661</td>
<td>1,129,065</td>
<td>12 11.1</td>
<td>8 3.1</td>
<td>61.3</td>
</tr>
<tr>
<td>1917</td>
<td>1,489</td>
<td>506,842</td>
<td>283,931</td>
<td>835,550</td>
<td>541,696</td>
<td>293,854</td>
<td>1,171,448</td>
<td>14 0.1</td>
<td>9 5.8</td>
<td>64.8</td>
</tr>
<tr>
<td>1918</td>
<td>1,489</td>
<td>458,738</td>
<td>292,014</td>
<td>987,267</td>
<td>744,751</td>
<td>242,516</td>
<td>1,194,220</td>
<td>16 0.0</td>
<td>12 9.4</td>
<td>75.4</td>
</tr>
<tr>
<td>1919</td>
<td>1,489</td>
<td>450,223</td>
<td>325,055</td>
<td>1,006,854</td>
<td>765,997</td>
<td>240,857</td>
<td>980,730</td>
<td>19 8.9</td>
<td>16 0.1</td>
<td>76.1</td>
</tr>
<tr>
<td>1920</td>
<td>1,500</td>
<td>463,199</td>
<td>356,823†</td>
<td>1,468,542</td>
<td>900,533</td>
<td>568,009</td>
<td>1,268,415</td>
<td>23 1.9</td>
<td>14 6.7</td>
<td>61.3</td>
</tr>
<tr>
<td>1921</td>
<td>1,500</td>
<td>462,898</td>
<td>352,342†</td>
<td>1,481,571</td>
<td>1,062,543</td>
<td>419,028</td>
<td>1,273,034</td>
<td>22 2.9</td>
<td>17 1.3</td>
<td>71.7</td>
</tr>
<tr>
<td>1922</td>
<td>1,500</td>
<td>363,036</td>
<td>398,112†</td>
<td>1,983,282</td>
<td>914,174</td>
<td>279,108</td>
<td>1,080,413</td>
<td>21 1.4</td>
<td>17 4.1</td>
<td>76.6</td>
</tr>
<tr>
<td>1923</td>
<td>1,500</td>
<td>420,151</td>
<td>569,390†</td>
<td>1,309,385</td>
<td>894,334</td>
<td>415,051</td>
<td>1,173,280</td>
<td>21 3.2</td>
<td>15 7.5</td>
<td>68.3</td>
</tr>
<tr>
<td>1924</td>
<td>1,717</td>
<td>499,535</td>
<td>733,212†</td>
<td>1,435,390</td>
<td>826,470</td>
<td>608,920</td>
<td>1,393,821</td>
<td>19 8.1</td>
<td>12 1.9</td>
<td>57.6</td>
</tr>
<tr>
<td>1925</td>
<td>1,728</td>
<td>552,567</td>
<td>467,120†</td>
<td>1,429,904</td>
<td>903,635</td>
<td>526,269</td>
<td>1,503,499</td>
<td>18 1.5</td>
<td>12 3.9</td>
<td>63.2</td>
</tr>
<tr>
<td>1926</td>
<td>1,728</td>
<td>551,408</td>
<td>459,759†</td>
<td>1,594,827</td>
<td>952,264</td>
<td>642,563</td>
<td>1,538,725</td>
<td>19 10.7</td>
<td>12 8.2</td>
<td>59.7</td>
</tr>
</tbody>
</table>

NOTE:– The Egyptian Pound – £E. = 20s. 6d. /
in the ratio of expenditure to receipts, viz., from 76.7 per cent. in 1913 to 59.7 per cent. last year, and the net profit has risen from £E.120,380 to £E.642,563, or by 433.8 per cent. In 1913 the railways carried 419,681 passengers, compared with 551,408 last year, or an increase of 31.4 per cent. During the same period the tonnage of revenue-earning goods traffic increased from 172,975 to 459,759, or by 165.8 per cent. Train-mileage has grown from 1,110,581 in 1913 to 1,538,725 in 1926, or by 38.6 per cent., whereas the net receipts per train-mile have advanced from 1s. 10.8d. to 7s. 2.5d. – or by 279.4 per cent.

The traffic during the years 1920–25 was considerably augmented by the conveyance of materials required for the construction of the Sennar Dam and the Gezira Irrigation scheme, but, apart from this, there has been a steady development in the general business of the railway.

Since the year 1914, when the control of the work at Port Sudan was transferred from other departments of the Government to that of the railway department, various ancillary services have been brought under the railway administration. Particulars of the working results of these services for the years 1914–26 are given below, but, as will be seen, the figures are not comparable year by year owing to the inclusion of additional services from time to time. The most important item included in the table is that relating to the working at Port Sudan, the rapid development of which receives subsequent reference. Taking the ancillary services as a whole, a good percentage of profit is now recorded, the ratio of working expenses to gross receipts for the year 1926 being 84.6 per cent.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Earnings. £E.</th>
<th>Working Expenses. £E.</th>
<th>Net Profit or Loss. £E.</th>
<th>Percentage of Working Expenses to Gross Receipts. Per cent.</th>
<th>Additional Services included.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1914</td>
<td>15,708</td>
<td>20,229</td>
<td>4,591</td>
<td>129.2</td>
<td>Port Sudan only.</td>
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<tr>
<td>1915</td>
<td>15,383</td>
<td>16,659</td>
<td>1,276</td>
<td>108.3</td>
<td>do.</td>
</tr>
<tr>
<td>1916</td>
<td>21,531</td>
<td>20,360</td>
<td>1,181</td>
<td>94.5</td>
<td>do.</td>
</tr>
<tr>
<td>1917</td>
<td>22,743</td>
<td>21,761</td>
<td>982</td>
<td>95.7</td>
<td>do.</td>
</tr>
<tr>
<td>1918</td>
<td>35,489</td>
<td>40,279</td>
<td>4,790</td>
<td>113.5</td>
<td>Caterig service.</td>
</tr>
<tr>
<td>1919</td>
<td>45,306</td>
<td>53,681</td>
<td>8,375</td>
<td>118.5</td>
<td>–</td>
</tr>
<tr>
<td>1920</td>
<td>114,065</td>
<td>140,053</td>
<td>25,988</td>
<td>122.8</td>
<td>{ Power stations and miscellaneous services.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>–</td>
</tr>
<tr>
<td>1921</td>
<td>160,760</td>
<td>177,936</td>
<td>17,176</td>
<td>110.7</td>
<td>–</td>
</tr>
<tr>
<td>1922</td>
<td>125,254</td>
<td>147,088</td>
<td>21,834</td>
<td>117.4</td>
<td>–</td>
</tr>
<tr>
<td>1923</td>
<td>161,204</td>
<td>138,755</td>
<td>22,449</td>
<td>86.1</td>
<td>–</td>
</tr>
<tr>
<td>1924</td>
<td>209,414</td>
<td>153,258</td>
<td>56,156</td>
<td>73.2</td>
<td>–</td>
</tr>
<tr>
<td>1925</td>
<td>210,710</td>
<td>165,840</td>
<td>44,870</td>
<td>78.7</td>
<td>–</td>
</tr>
<tr>
<td>1926</td>
<td>239,868</td>
<td>202,963</td>
<td>36,905</td>
<td>84.6</td>
<td>{ Mechanical transport. /</td>
</tr>
</tbody>
</table>
Organisation and Administration.

The railways and steamers are administered as a department of the Sudan Government, under the immediate control of a General Manager (Mr. A. C. Parker), whose headquarters are at Atbara. The organisation is on the departmental principle, as shown in the chart on this page.

The business of the Railways and Steamers Department is transacted through five main departments, viz., Executive, Traffic, Civil Engineering, Mechanical Engineering, and Stores, while the control of the work at Port Sudan is under a Port Manager, responsible directly to the General Manager. The accounting work is a branch of the General Manager’s office, and is under the control of an officer styled Chief Auditor. In order to enable the General Manager to exercise close supervision over the various departments and to co-ordinate their work, a Standing Committee, consisting of the chief officers of the before-mentioned departments, meets at frequent intervals, when all matters of principle affecting the general conduct of the operations of the various departments are discussed.

While the supervisory posts are mainly held by British officials, out of a total staff of 15,084, as at December 31, 1926, only 269 were British, and 217 other European nationalities; 12,948 were Sudanese, 1,530 Egyptians, and 120 other nationalities.

Permanent Way and Works.

On December 31, 1926, there were 1,728 route-miles of line, with a track mileage of 1,891 miles, all on the 3-ft. 6-in. gauge, the whole

Insert Diagram of the running lines being of single track. Generally speaking, the configuration of the country traversed by the railway is flat, except in the region of the Red Sea hills, where there is a continuous rising gradient of 1 in 100 for 50 miles from Sallom Junction to Gebeit, followed by a short stretch of 1 in 125 to Summit, 3,000 ft. above sea level.

Steel-flanged rails, weighing 75 lb. per yard, are now laid on a considerable portion of the system, although 50-lb. rails are employed on the desert section from Halfa to Abu Hamed, the Kareima Line, the Khartoum-El Obeid Section, and the Kassala Line, as well as on one or two minor branch lines. The 50-lb. rail is in 30-ft. lengths, carried on 12 sleepers 6 ft. 6 in. by 8 in. by 4 1/2 in. The 75-lb. rail is in 30-ft. and 36-ft. lengths, the latter being the present standard. The 30-ft. lengths are supported by 12 sleepers, and the 36-ft lengths by 14 sleepers, the dimensions being 7 ft. 6 in. by 9 in. by 5 in. Generally speaking, wood sleepers (pitch pine, Jarrah or Oregon pine) are employed, but in certain districts where the white ant exists, steel sleepers have had to be used. The rails usually rest on a bearing plate which is secured to the sleepers by screws and the rail-joints are staggered. The line across the desert is laid in and ballasted with gravel or sand,
which is also packed tightly under the bottom flange of the rails, thus forming a continuous elastic support; the result is a very smooth running track. Elsewhere, the ballast used depends on the nature of the ground, in certain bad sections stone metalling being supplied.

Apart from four bridges at Atbara, Khartoum, Kosti and Port Sudan, there are no important structures. During the last 25 years, however, a good deal of flood prevention work has been done in the construction of bridges across the numerous khors, or flood watercourses, some of the structures being of considerable size. In a very severe rainy season, wash-outs are not infrequent, these often considerably disorganising the train working.

Renewals are carried out in accordance with a definite annual programme, based on the ascertained, or estimated, life of the various units, e.g., rails, sleepers, bridges, &c., and charged to a Renewals Fund; 95 miles of track were re-sleepered during 1926.

There are at present some 125 stations, and except at the more important, platforms are not provided. The station buildings and lay-out are of a simple character. The main engineering shops are situated at the Railway Headquarters, Atbara.

Signalling and Block Telegraph.

The Tyers Electric Tablet system of single-line block working is in operation throughout the railway, with the exception of the Kassala line, which is operated by the Electric Key Token system.

The wayside stations between Halfa and Atbara, and between Musmar and Port Sudan, are equipped with central ground frames, point rodding throughout the whole length of the station, facing point locks on all main-line facing points, with detectors, and one outer signal at each end of the loop. On the sections between Atbara and Khartoum, and Khartoum and Wad Medani, where there is a heavier traffic, and non-stop trains are run, the stations are also equipped with outer home, home, and starting signals worked from a ground frame at each end of the station. The points are provided with facing point locks, and all points and signals are interlocked.

At junctions and important stations, such as No. 10 Junction, Abu Hamed, Atbara Junction, Port Sudan, Khartoum Central and Sennar, signal cabins or elevated ground frames, and complete interlocking, are provided.

As, however, the traffic on many sections of the line is very light, a complete system of interlocking signals is not necessary, and in many cases only outer home signals, worked by an independent lever from the points at each end of the station (or crossing loop), are provided. The points are worked by tumbler levers. The signals are of the lower quadrant type, and twin target point indica-
tors are provided at a number of stations. The total number of levers in use at the end of 1926 was 1,173.

At present the track capacity of the line is definitely limited owing to the long block sections on the flat, and to the heavy gradients on the Red Sea slopes, where comparatively short sections are occupied by trains for over an hour, and even 90 minutes, on the up grade. Sections 15 to 20 miles in length are quite common on the level, and on the desert sections they are as long as 28 miles in places.

**Locomotives.**

On December 31, 1926, the total locomotive stock of the Sudan Government Railways numbered 139, comprising 117 tender engines and 22 tanks, used for shunting purposes. The majority of the engines are of British manufacture, and are of varying types to suit the conditions of working which obtain in the different sections of the system.

Until recent years the 4-6-0 type has been the most generally employed, as being suitable for general passenger and goods-train working, as well as for the mixed trains which are run on all sections. The tractive effort of these engines ranges from 11,200 lb. to 21,900 lb., and there are now about 50 engines of this type in service. There are 15 ‘Pacifics’ (tractive effort 17,300 lb. saturated or 19,000 lb. superheated) used for general passenger and mixed work on the Halfa (desert) section. These are two-cylinder engines, with 4-ft. 6-in. driving wheels, cylinders 17 in. by 24 in., with a working pressure of 180 lb., and having a total weight of 99 tons. Also, there are 16 2-6-0’s (tractive effort 15,500 lb. and 16,400 lb.), and four 4-4-2 passenger engines (tractive effort 18,200 lb.). These have 5-ft. 2 1/2-in. driving wheels, and cylinders 18 in. by 26 in.

In recent years, with the object of increasing the train loads, some heavier types of engines have been introduced, notably the 2-8-2 ‘Mikado’ engines, of two types—a heavy and a light. The heavy engines, of which there are 12, have 4-ft. 6-in. driving wheels, and cylinders 21 in. by 27 in. They are designed for a working pressure of 180 lb., but are now operated at 160 lb. only. At the latter pressure their tractive effort is 30,000 lb., and the total weight of engine and tender is 130 tons. These are employed on the heavy gradients on the Red Sea line.

The lighter ‘Mikados,’ of which there are 10, were introduced on the Kassala line, in order to suit the lighter 50-lb. rail used on that section, and yet be powerful enough to negotiate the gradient mentioned above. They are, however, now employed more generally. They have 4-ft. 3-in. driving wheels, and cylinders 19 in. by 26 in. At a boiler pressure of 180 lb. these engines have a tractive effort of 26,000 lb. and haul trains of 600 tons. Their total weight is 111 tons.

The latest type of locomotive introduced on the Sudan Government Railways is the ‘Prairie,’ 2-6-2, introduced in 1925, which has proved very satis-
factory in hauling mixed trains up to 900 tons weight with very economical coal consumption. Twelve of these engines are in service. The leading dimensions are:

- Driving wheels, 5-ft. 2 1/2-in. diam.; cylinders, 21 in. diam. by 27-in. stroke; boiler pressure, 180 lb.; tractive effort, 29,000 lb.; total weight, 127 tons 5 cwt. The boilers and general details of these engines are standard with the heavy 'Mikado' type.

There are on order, and nearing completion, 10 further engines of a composite type, for use on the 50-lb. rail, having boilers standard with the light 'Mikados' and all other details standard with the before-mentioned 'Pacifics,' except that the cylinders have a diameter of 18 in. There are also on order four six-wheeled side-tank shunting engines, which are now in process of shipment, and these engines will be shipped completely finished instead of by the usual method of dissembling and packing. (Ten additional fourth-class carriages will be treated in the same way.)

On certain sections of the railway, particularly the Red Sea line, considerable difficulty is experienced in regard to feed water for the locomotive boilers, owing to the very large proportion of solids contained in the well water which has to be used. This necessitated the provision of water-softening plant, and filtrators are being tested out on certain of the locomotives.

The coal employed for locomotive purposes is almost entirely 'Natal,' the consumption per productive train-mile for the past three years being 65.7 lb. in 1924, 64.1 lb. in 1925, and 64.3 lb. in 1926.

Passenger Stock.

The coaching stock at December 31, 1926, comprised 267 vehicles, there being 14 sleeping cars, 3 dining, 3 kitchen and 3 buffet cars, 9 first class, 13 second class, 30 third class, 60 fourth class, 14 composite first and second, and 5 composite second and third-class carriages. In addition, there are 29 baggage and post cars, 4 saloons, a hospital car, and 79 service cars. Accommodation is provided for first, second, third and fourth-class passengers, and dining and sleeping cars are run on the long-distance express and boat trains. The accommodation compares very favourably with that on the British railways.

Generally speaking, the policy has been to use coaching stock built in England, although in recent years a number of carriages have been constructed in the Atbara Works on underframes and bogies purchased in England. There is no general standard of construction, the length of body over buffers varying from 34 ft. and 40 ft. in the case of the fourth-class carriages to 63 ft. in the case of the larger sleeping and buffet cars. The standard width is 9 ft., while the overall height from rail level varies from 10 ft. 11 in. in the case of the fourth-class carriages to 12 ft. 4 in. for the first and second-class carriages. Four-wheel bogies
are provided on the whole of the passenger carriages, and the vacuum brake is fitted to all coaching vehicles.

Except in the case of the third and fourth class (the latter being restricted to the use of Sudanese passengers), all vehicles have side or centre corridors with communicating gangways at each end. Lavatory accommodation is provided on every vehicle, and all are equipped with the Stone system of electric lighting. Electric fans are fixed at each end of the cars, and in each first-class compartment. Only end doors are provided. The first-class carriages have five compartments accommodating 30 passengers, the second class seven compartments, accommodating 42 passengers, and the third class (50-ft. coaches) are of six compartments with the centre corridor arrangement, seating 52 passengers.

All passenger-carrying stock is fitted with outside sunshades over the windows, and in the case of the dining and sleeping cars and first-class carriages the window panes are of tinted glass to counteract the glare of the sun. The vehicles, except the fourth class, are painted white outside, which besides giving them a very smart appearance, is found to be most suitable for deflecting the sun’s rays.

Three types of sleeping car are in use, one having 10 berths in five compartments, another with 14 berths in seven compartments, and a third with seven single-berth and two double-berth compartments. In general, the internal fittings are similar to those provided on British railways, including separate toilet in each compartment, and lavatories at both ends of the car, but the berths are more spacious than those found on the home railways, and are very comfortable. Electric fans are provided in every compartment. A Sudanese attendant is in charge of each car.

There are four luxurious saloons, containing bed and bath rooms, saloon compartment and kitchen, for the use of distinguished guests of the Government and for hire to members of the public. One of these vehicles issued by H.E. the Governor-General when he travels. The length of these coaches ranges from 45 ft. to 65 ft. 9 in. over buffers, and their appointments and equipment are all of the latest design. The service cars, of which there are 79, vary in dimensions and design, those of the departmental heads being white-painted bogie vehicles, provided with office, bed and bathroom, and kitchen. For the use of the Inspectorate Staff of the Traffic, Locomotive and Engineering Departments there are a number of smaller four-wheel service cars.

The dining cars have accommodation for 34 passengers, at tables for two on one side and four on the other of a centre gangway. Side doors are provided at one end and in the centre of the car, in each case opening on to both sides of the line. These cars have no kitchen, and a separate kitchen car is run as a complement. The kitchen cars are furnished with coal-fired cooking ranges, and their equipment includes adequate storage accommodation, with ice chests and filters.
for drinking water. Two of the buffet cars are capable of seating 24 passengers, and the third 18 passengers, and all are self-contained units fitted with a kitchen.

Freight Stock.

Although many smaller wagons are in use, it may be said that the standard capacity of the wagon stock of the Sudan Government Railways is 30 tons. Most of the units were built in England, and erected in the Sudan. At the end of 1926 the total freight stock numbered 1,586 vehicles, of which 413 were open wagons, 590 covered wagons, 155 cattle wagons, 50 flat wagons, 40 oil-fuel tanks, 109 stone, boiler and brake vans, 70 service vehicles, and 159 water tanks.

The standard 30-ton bogie open goods wagon, the tare of which is 46 per cent. of the load, is a well-built vehicle comparing favourably with the latest railway practice, and the same may be said of the 30-ton standard covered wagon. Both types are steelbuilt / vehicles, carried on two four-wheel bogies, the leading dimensions being as follows:

<table>
<thead>
<tr>
<th></th>
<th>30-Ton Open Wagon</th>
<th>30-Ton Covered Wagon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tare</td>
<td>14 tons</td>
<td>15 tons</td>
</tr>
<tr>
<td>Length over body</td>
<td>35 feet</td>
<td>35 feet</td>
</tr>
<tr>
<td>Length over buffers</td>
<td>38 feet</td>
<td>38 feet</td>
</tr>
<tr>
<td>Width over buffers</td>
<td>3 feet 3 inch</td>
<td>8 feet 3 inch</td>
</tr>
<tr>
<td>Height of body</td>
<td>3 feet 6 inch</td>
<td>7 feet 3 inch</td>
</tr>
<tr>
<td>Wheelbase</td>
<td>22 feet 11 inch</td>
<td>22 feet 11 inch</td>
</tr>
<tr>
<td>Cubic capacity</td>
<td>1,037 cub. feet</td>
<td>2,090 cub. feet</td>
</tr>
</tbody>
</table>

Of the cattle wagons, 74 are of 30 tons capacity, and, in addition, there are 48 25- and 30-ton flat wagons, and 48 25- and 30-ton brake vans. Other large vehicles are 26 1/2-ton bogie oil-tank wagons and 5,000-gallon water-tank wagons, which are necessary to supply water to the desert stations, many of which are waterless, for the use of the resident staff. The water-tank wagons are cylindrical tanks, 30 ft. long by 7 ft. wide, with an inside diameter of 6 ft. 9 in., mounted on steel frames 2 ft. 9 in. from rail level, and carried by two four-wheel bogies. All main-line freight vehicles are fitted with the vacuum brake.

Locomotive, Carriage and Wagon Shops.

The main locomotive, carriage and wagon works are situated at Atbara, and are principally contained in three large steel-framed corrugated-iron buildings. In addition, there is a large stock shed. All the construction work undertaken in the Sudan is carried out in these works, as well as the erection of rolling-stock purchased abroad, and all heavy repairs. A material extension of the works has recently been carried out, consequent upon the additional work which followed the construction of the Kassala line, and the works are now well equipped and
adequate for the requirements for some years to come. The heavy machinery is
driven by electricity. There is also an electrical repair shop for the maintenance
of electrical machinery and electric train-lighting plant.

In addition to the main works at Atbara, there are small repair shops at Khar-
toum Central, Halfa, Gebeit, Port Sudan, Kosti and Abu Hamed, at which light
repairs work is carried out.

Electric power stations for the generation and supply of electrical energy are
operated by the railways at Atbara, Port Sudan, and Halfa. At Atbara a new sta-
tion has recently been constructed, equipped with two 120-kW. Diesel units and
a 250-kW. Allen set. In addition to the railway requirements, the respective towns
are supplied with current for domestic and other lighting purposes.

Passenger Traffic.
The total number of passengers carried during 1926 was 551,408. While this is a
slight decrease compared with the previous year, the reduction was attributable
to the completion of the work on the Sennar Dam, and occurred in the second
and third classes only, there being an increase of 5,251 in the number of fourth-
class passengers.

Four classes of passengers are catered for, the first and second classes being
mainly used by Europeans, and the third and fourth by the natives, the fourth
class being definitely restricted to their use. Although the greater proportion of
the long-distance travel is by Government officials of the various administrative
departments and their families, travelling on business or leave, there has lat-
terly been an appreciable increase in the fourth-class passenger journeys, which
evidences a growing disposition on the part of the native population to use the rail-
ways. There is also a developing tourist business in the winter season, principally
to Khartoum and the south, in addition to which big game and other shooting
parties, to whom special facilities are off
erred, are becoming a regular feature.

Owing to the light nature of the passenger traffic on most sections of the line,
the principle of running mixed trains is closely followed, and, on the busier sec-
tions, viz., Atbara and Khartoum, Khartoum and Wad Medani, and Atbara and
Port Sudan, one passenger service per day in each direction usually suffices. It
is, therefore, possible to secure excellent train loads, and trains of 500–600 tons
are usual. The passenger trains are scheduled at an average speed of 35 miles per
hour, and mixed trains at 30 miles per hour.

Passenger Fares.
The basic fares, as published in the coaching tariff, are quoted at ‘milliemes per
kilometre.’ Converted into English equivalents, they are as shown below:
Anon., ‘The Railways of Africa’ 223

<table>
<thead>
<tr>
<th>Class</th>
<th>Fare per Mile</th>
<th>Surtax</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>2.497</td>
<td>40 per cent.</td>
</tr>
<tr>
<td>Second</td>
<td>1.748</td>
<td>40 per cent.</td>
</tr>
<tr>
<td>Third</td>
<td>0.874</td>
<td>60 per cent.</td>
</tr>
</tbody>
</table>

Fourth:
- 1–31 miles: 0.482
- 32–62 miles: 0.442
- 63–93 miles: 0.402
- 94–124 miles: 0.362
- 125–155 miles: 0.321
- 156–186 miles: 0.281
- 187–248 miles: 0.241
- 249–372 miles: 0.201
- 373–559 miles: 0.160
- Over 559 miles: 0.129 -50 per cent.

For sleeping-car accommodation, a supplement of £E.1 per head per through journey is charged in addition to the first-class fare, but Government officials, their wives and families, are allowed a reduction of 50 per cent.

Various reduced fare facilities are in operation. For example, cheap return holiday tickets are issued, between May 1 and October 31, from Khartoum to Port Sudan and certain intermediate stations, at a single fare and a quarter, available for 14 days. Members of the commercial community in the Sudan and their families are allowed a similar concession at any time of the year when travelling on their annual leave, the tickets being available for six months. A concession is also given for local leave to European members of certain industrial firms in the Sudan, in the form of a rebate of 50 per cent. off the ordinary fare.

Traders who have in the previous complete year paid the railways freight charges to the value of £E.1,500 on their goods are allowed a rebate of 50 per cent. in respect of all rail or steamer journeys made by one specified member of the firm, with an extension of the concession to one other member for each additional £E.1,000 paid in freight charges.

Concessions ranging from 50 to 70 per cent. off the ordinary fares are given to persons importing agricultural labourers, artizans, &c., under approved conditions; to parties of excavators of antiquities, and their labourers; and to missionaries and clerics who work in the Sudan.

Sudan Government officials and their families and servants are allowed free or reduced fare warrants in accordance with the Sudan Government Travelling Regulations; and varying concessions are also allowed to officers and men of the British and Egyptian armies and to officials of neighbouring British territories.

* In 1918, in order to meet post-war conditions, a surcharge of 50 per cent. was imposed on all passenger fares, increased in 1920 to a maximum of 100 per cent. Subsequently, reductions have been made by successive stages to the percentages shown.
Communications in Africa, 1880–1939: Volume 4

travelling on duty or on leave, and to their dependants; these reductions range from 50 to 75 per cent.

Passengers are granted a free allowance of accompanied luggage, varying from 1 cwt. for first class to 1/2 cwt. for fourth class, beyond which allowances excess is payable. All luggage may be registered for a fee of 1s. per package.

Catering and Hotels.

The catering arrangements on the trains and steamers, as well as the management of the railway hotels, are in charge of a Catering Superintendent, who is responsible to the Superintendent of the Line. His headquarters are at Khartoum. The service, which is excellent, is performed by Sudanese staff, supervised by a European train or boat manager. Two hotels are owned and worked by the railway department, viz., at Port Sudan and Khartoum, the latter having been acquired recently in connection with the development of tourist traffic. Both are substantial structures, and provided with modern equipment suitable for a sub-tropical country.

Freight Traffic.

During the year 1926, 459,759 tons of freight traffic were conveyed, exclusive of railway stores and coal. The public traffic consists of the commodities imported for domestic use and consumption, e.g., cotton stuffs, salt, sugar, tea, soap, petroleum, &c., but more particularly of the products of the country conveyed to Port Sudan and Halfa for export, such as dura (wheat), cotton and cotton seed, gum, ground and dom nuts, simsim (millet), cattle and sheep, and hides. There is also a considerable local traffic in grain, dates, &c., which form the principal food of the native population. A large proportion of the traffic is capable of bulk loading, and the fullest advantage has been taken of the opportunity to secure good loads by the provision of high-capacity wagons for the conveyance of such traffics as gum, grain and cotton. The average capacity of all revenue-earning freight stock for the year 1926 was 25.5 tons, and the average load 14.23 tons. With the latest type of ‘Prairie’ class engine, train loads of 800 tons are operated. The areas of production, alike of cotton, grain and gum, are mainly south of Khartoum, so that a long haul is secured for the best-loading traffics. The average length of haul of revenue freight traffic in 1926 was 383 miles, and the average train load 428 tons. No cartage services are performed by the railways, and the traffic is, therefore, entirely ‘station to station.’

Although by no means the only source of supply, cotton is produced in greatest quantities in the area known as the Gezira Plain, situated between the converging Blue and White Niles, south of Khartoum. Ginning factories are provided at convenient points, where the cotton is separated from the seed and
baled ready for conveyance by rail. The principal forwarding station is Meringan, which is situated in the heart of the Gezira.

Gum is produced in the Province of Kordofan, and in the adjoining Provinces of Darfur and Nuba Mountains, where it grows mostly in a wild state, and is gathered by the natives and brought into El Obeid and neighbouring stations. There it is cleaned, sold by auction (under Government supervision) to the gum merchants, and despatched by rail to Port Sudan for export. The trade is a very lucrative one, recent export values being in the region of £35 per ton. A special railway rate of £9 per ton is in operation for truckloads of gum from El Obeid to Port Sudan – a distance of 922 miles.

March and April are the busiest months for export traffic, and then the capacity of the line is taxed heavily, a maximum of five trains per day each way having been reached between Atbara and Port Sudan last year. The theoretical capacity of the line is only six trains every 24 hours – due to the very long block sections. In view of the anticipated increase of traffic, the question of improving the track capacity, either by shortening the longer sections, or by other means, is at present under consideration.

Rates.

The rates tariff in the Sudan is built up in three divisions:— (1) The conveyance charge – generally on the basis of equal rates per ton per mile; (2) the weighing and station service charge; (3) the loading and unloading charge. All carriage charges must be prepaid, except in the case of firms having ledger or credit accounts. The general scale of rates is quoted in ‘Milliemes per 10 kilogrammes per kilometre.’ Converted to English equivalents, the rates per ton per mile are as under:–

<table>
<thead>
<tr>
<th>Class</th>
<th>Per ton per Mile. d.</th>
<th>*Surtax.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>1.577</td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>1.104</td>
<td></td>
</tr>
<tr>
<td>Second</td>
<td>0.709</td>
<td></td>
</tr>
<tr>
<td>Third</td>
<td>0.630</td>
<td></td>
</tr>
<tr>
<td>Fourth</td>
<td>0.552</td>
<td></td>
</tr>
<tr>
<td>Fifth</td>
<td>0.394</td>
<td></td>
</tr>
<tr>
<td>Sixth</td>
<td>0.315</td>
<td></td>
</tr>
<tr>
<td>Seventh</td>
<td>0.236</td>
<td></td>
</tr>
</tbody>
</table>

Varying from 40 to 100 per cent., according to traffic.

There are, however, a number of special rates in force, e.g., for agricultural and mining implements and machinery; for gum, grain, and other traffic for export; for specified minimum numbers of cattle and minimum quantities of traffic; and generally for long-distance and through traffic. Also, the surcharge has now been abolished altogether in the case of a number of specific commodities. The

* In 1916, in order to meet war-time conditions, a surtax of 10 per cent. was added, increasing by stages to a maximum of 100 per cent. in 1920. Subsequently, reductions have been effected to the percentages shown.
average earnings per ton-mile in 1926 were 1.591d. These rates do not apply to the steamer services, for which there is a separate tariff, generally on a somewhat higher basis.

Port Sudan.

Port Sudan, the principal seaport of the country, is a natural harbour with easy access from the Red Sea, and well sheltered from the prevailing wind. It was constructed in the year 1906, when the railway was extended from Atbara to the Red Sea. The harbour has an area of approximately 168 acres, varying in depth from 30 ft. to 119 f., and the anchorage and swinging basin area is about 113 acres. The main quay is 2,050 ft. in length, and accommodates five vessels of the class ordinarily using the harbour, and there are also quays of 650 and 300 ft. for the use of the small coasting craft and native sailing boats which bring in salt, &c.

The equipment of the Port includes four electric coal transporters having a travelling range of 810 ft., with a coaling capacity of 120 tons per hour, and there is a re-handling transporter which extends their range from the quay wall from 225 to 450 ft. All coal for railway and other uses is brought into Port Sudan, and there is an increasing bunker trade for shipping. There is also an oil depot for bunkering oil-burning vessels. For general cargo, there are four 4-ton, two 5-ton and one 7-ton electric gantry cranes. Good warehouse and customs accommodation is available, the total floor space being 105,574 square feet. The Port equipment includes an adequate floating plant, a dockyard, and a dockyard workshop.

The development of the Port has been rapid, the number of vessels calling having increased from 315 in 1913 to 825 in 1926; the tonnage of imports from 114,486 tons in 1914 to 197,968 tons in 1926; and the tonnage of exports from 22,912 tons in 1914 to 126,018 tons in 1926. The total quantity of cargo landed and shipped last year was 546,668 tons, and the gross tonnage, including railway goods tonnage handled at the quays, amounted to 989,497 tons.

The Port is now used by the vessels of all the important shipping lines which operate services through the Red Sea. In order to keep pace with the growth of business, extensive additions to the accommodation have recently been undertaken, and are now approaching completion. These include an extension of the main quays and the construction of two new quays with four coal transporters of the latest design, having an average discharge of 80 tons an hour, for dealing with coal traffic.

In view of the increasing activities at Port Sudan, and in order to co-ordinate the work of the various departments there, the control of the whole of the operations was recently placed under an officer styled Port Manager, who is directly responsible to the General Manager for the conduct of the work.
Anon., *The Railways of Africa* 227

### Steamer Services.

The railways are at present confined to the northern half of the Sudan, and extensive river steamer services are also operated by the Railways and Steamers Department. They form a most important adjunct, as they provide the only means of communication with the southern portion of the territory. Services are operated as follows:

<table>
<thead>
<tr>
<th>Distance Miles.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Shellal and Halfa</td>
<td>210</td>
</tr>
<tr>
<td>Between Kareima and Kerma (Dongola Reach)</td>
<td>209</td>
</tr>
<tr>
<td>Between Khartoum and Rejaf (near the Uganda border)</td>
<td>1,093</td>
</tr>
<tr>
<td>Between Malakal and Meshra-el-Rek (on the Bahr-el-Ghazal)</td>
<td>258</td>
</tr>
<tr>
<td>Between Extension of above service to Wau in flood season</td>
<td>133</td>
</tr>
<tr>
<td>Between Makwar and Roseires (Blue Nile)</td>
<td>174</td>
</tr>
<tr>
<td>Between Khartoum and Gambela, on River Baro – in flood season. (Distance from Malakal)</td>
<td>358</td>
</tr>
<tr>
<td>Total</td>
<td>2,435</td>
</tr>
</tbody>
</table>

The steamer services naturally divide into three sections, serving different parts of the Nile. They are quite separate units, and inter-communicate for traffic purposes through the railways.

The accompanying table illustrates the extent to which this important branch of the department has developed since 1913. While the results show a falling-off in traffic during the last few years, this occurred mainly on the Shellal-Halfa Reach, and is due to the development of the Port Sudan route in preference to the Nile route for import and export traffic, as well as for the extensive ‘leave’ traffic. The regular services on the Halfa-Shellal Reach must, however, be maintained in order to convey the Mails.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>Tons.</td>
<td>£E.</td>
<td>£E.</td>
<td>£E.</td>
<td>Per Cent.</td>
<td></td>
</tr>
<tr>
<td>1913</td>
<td>65,837</td>
<td>2,731</td>
<td>36,363</td>
<td>22,395</td>
<td>13,968</td>
<td>61.6</td>
<td>Shellal-Halfa service only.</td>
</tr>
<tr>
<td>1914</td>
<td>67,528</td>
<td>14,529</td>
<td>45,133</td>
<td>36,044</td>
<td>9,089</td>
<td>79.9</td>
<td>Dongola service taken over.</td>
</tr>
<tr>
<td>1915</td>
<td>54,155</td>
<td>15,411</td>
<td>41,495</td>
<td>39,286</td>
<td>2,209</td>
<td>94.7</td>
<td>–</td>
</tr>
<tr>
<td>1916</td>
<td>61,001</td>
<td>33,930</td>
<td>60,952</td>
<td>47,041</td>
<td>13,911</td>
<td>77.2</td>
<td>–</td>
</tr>
<tr>
<td>1917</td>
<td>69,187</td>
<td>45,657</td>
<td>66,321</td>
<td>47,041</td>
<td>13,911</td>
<td>83.5</td>
<td>–</td>
</tr>
<tr>
<td>1918</td>
<td>101,499</td>
<td>82,989</td>
<td>231,214</td>
<td>180,937</td>
<td>50,277</td>
<td>78.3</td>
<td>Steamers south of Khartoum taken over.</td>
</tr>
<tr>
<td>1919</td>
<td>99,279</td>
<td>62,471</td>
<td>240,671</td>
<td>186,278</td>
<td>54,393</td>
<td>77.4</td>
<td>–</td>
</tr>
</tbody>
</table>
Ye a r.

Passengers Carried.

T onnage of Goods.

T otal Earnings.

W orking Expenses.

Net Profit.

Percentage of W orking Expenses to Gross Earnings.

Remarks.

No. T ons. £E. £E. £E. £E. Per Cent.

1920 107,502 73,969 380,622 241,409 132,113 63.4 –

1921 125,132 50,075 358,719 262,877 88,332 73.3

Decrease due to development of Port Sudan route in preference to that via Halfa.

1922 89,585 38,128 313,807 238,886 67,821 76.1 –

1923 81,182 36,173 273,161 218,038 55,123 79.8 –

1924 96,072 43,527 269,518 206,118 63,400 76.5 –

1925 75,652 47,228 269,036 204,778 64,258 76.1 –

1926 73,334 50,224 281,304 219,853 61,451 78.2 –

Working Results of the Sudan Government Steamer Services.

Broadly, the control and operation of the steamer services falls under the appropriate departments of the railway, viz., traffic and provisioning under the Traffic Department, and construction, maintenance, and operation under the Chief Mechanical Engineer. At Khartoum, however, the extensive services are under the supervision of a District Traffic Manager, responsible through the Southern Divisional Superintendent to the Superintendent of the Line. The Chief Mechanical Engineer is represented by a Superintendent Engineer, who not only maintains the fleet, but commissions the boats, and is responsible for their navigation.

At December 31, 1926, the total fleet consisted of 42 stern-wheel steamers, 4 paddle-wheel steamers, 14 tugs, 8 steam launches, 11 petrol, &c., launches, 134 barges, 3 floating docks, 3 dredgers, 10 pontoons, and numerous auxiliary river craft. A detailed description of the craft is not here possible, but the largest vessels are the two mail boats, Sudan and Britain, employed on the Halfa Reach. These are stern-wheelers of 360 gross tons, with a draught of 4 ft. 6 in., and are very commodious craft, equipped with good passenger cabin and saloon accommodation, bathrooms, electric lighting, fans, &c. Owing to the presence of sandbanks on this Reach, the majority of the vessels are restricted to a draught of 3 ft. 6 in., and the Sudan and Britain can be operated only when the river is in flood – from August to March. The largest boats on the Khartoum South service are of 225 tons, and on the Dongola Reach, 185 tons. The majority of the steamers are stern-wheelers, which type of propulsion is most suitable on the Nile.

On the Halfa-Shellal Reach, three services each way per week are run. On the Dongola Reach, where the traffic is light, the passengers and mails are carried by
a weekly service in the winter, and a fortnightly service in the summer. South of Khartoum, the main regular service is the fortnightly postal steamer from Khartoum to Rejaf, with connecting services from Malakal to Meshra-el-Rek in the winter – extended to Wau in the summer. The latter services are chiefly for political and military purposes. There is also a fortnightly intermediate service from Khartoum to Renk. Besides these definite services, operating all the year round, there are regular flood services from May or June to December between Makwar and Roseires, on the Blue Nile, and from Khartoum to Gambela, on the Baro River, within the Abyssinian frontier. In addition, there is continual chartering of steamers by the Provinces and Departments for work in connection with the administration of the country, and by shooting parties. No catering is provided on the Dongola steamers, but on all other advertised sailings an excellent service is maintained by the Catering Department.

A separate rates and fares tariff is in force for each group of steamers, but for the entire service the average receipt per passenger journey last year amounted to 23s. 8.3d., and the average receipt per ton of freight to 42s. 6.4d.

A feature in connection with the operation of the steamer services is the use of barges as auxiliaries both for passenger and goods work. As the vessels are mainly driven by stern paddle wheels, it is not possible to tow the barges, and they are, therefore, lashed alongside and/or propelled in front. On the southern services as many as seven barges are attached to a steamer, one at each side, and five in wedge formation, lashed by special steel mooring ropes, in front. The larger barges have a carrying capacity of 100 tons.

The steamer crews consist of one engineer in charge (British or European), one second engineer, two greasers, four firemen, one navigator, an assistant navigator, and from 6 to 10 sailors. Until recently, the principal fuel consumed by the steamers was wood, but coal has now been substituted on a number of the vessels, with economical results and improved timing. Oil fuel is used to a limited extent, and one of the latest additions to the fleet at Khartoum is a heavy-oil-engined stern-wheel steamer. This vessel was designed to secure economy in running costs, and has fulfilled expectations.

Steamer Dockyards.

There is a dockyard at Halfa for the maintenance of the Halfa-Shellal fleet, and a small dockyard repair shop at Kareima, where the vessels engaged on the Dongola service are repaired. The principal dockyard, however, is at Khartoum North, where a modernised plant exists, capable not only of maintaining the whole of the vessels used on the Khartoum and South services, and the construction and erection of new hulls, but also of carrying out a considerable amount of work for the Irrigation Department. Although in the past a good deal of new work has been
undertaken, in recent years the policy has been to confine the dockyard to main-
tenance work, and to purchase new hulls in England and erect them at Khartoum.

Mechanical Transport.

A recent development on the Sudan Railways is the establishment of a Mechani-
cal Transport Section, under the control, at present, of / the General Manager. Some useful pioneer work has already been accomplished in opening up areas at present inaccessible to rail or steamer services. The more important is that between Rejaf, the southern terminal point of the Nile steamers plying south of Khartoum, and Aba, in the Belgian Congo, thus providing a connecting link between the Sudan and that huge undeveloped country, and an outlet for its produce via the Nile route and Port Sudan. Another motor transport service was inaugurated last December, between Tonga, on the Nile, and Talodi, to bring cotton, &c., from the interior of the Nuba Mountains Province to the river.

Many different types of motor lorry have been tested on these services, the principal being the Thornycroft six-wheel rigid type, which is performing excellent service.

Owing to the fact that huge areas of the Southern Sudan are of a swampy nature, the construction of railways is rendered extremely difficult and costly. Therefore the road services established, which have proved a great success, are doubtless the forerunners of others.

London Office.

The Sudan Railways and Steamers have offices at Wellington House, Bucking-
ham Gate, under the supervision of the Controller, Sudan Government London office. These offices deal with public inquiries, arrange the passages of all Sudan Government officials travelling to and from the Sudan on leave or on business, and, in collaboration with headquarters at Atbara, attend to advertising and publicity matters. Here, also, the Advisory and Inspecting Engineers arrange the contracts for stores and materials purchased in England, and their inspection. In addition, the former deals with the engagement and appointment of all staff required by the Sudan Government Railways and Steamers.

Sennar Dam – Irrigation.

In view of the relative importance of irrigation to the development of the rail-
ways and the country, brief reference may be made to the great irrigation scheme on the Gezira Plain. The plain lies in the triangle formed by the junction of the Blue and White Nile, and, in order to open up this area for the cultivation of cot-
ton, grain, &c., a great dam, 1 5/8 miles long, has been built across the Blue Nile
at Sennar, 170 miles south of Khartoum. It was completed at the close of 1925. The barrage is closed in the flood season, and ponds back the river for a distance of 58 miles, creating a huge storage lake of 636,000,000 cubic m. of water. By means of a main canal, 62 miles long, and a vast network of regulated minor and subsidiary canals, the stored water is distributed as required over the Gezira Plain during the season when the river is low. The irrigation scheme is capable of supplying water to an area of 3,000,000 acres, but, as a first step, 300,000 acres only are being dealt with, 100,000 of which are put under cotton, 100,000 under grain, while 100,000 acres lie fallow each season in rotation. The dam was constructed by the Sudan Government, but the supervision of the cultivation is carried out by the Sudan Plantations Syndicate, which holds a concession from the Government until June, 1950. There is thus a three-party partnership between the Government, the syndicate, and the native cultivator. The proceeds of the crop are divided on a definite percentage basis, the Government at present receiving 37 1/2 per cent., the Syndicate 22 1/2 per cent., and the native cultivator 40 per cent. The latter merely provides the labour – water, seed, and everything else being found for him. The results achieved during the first year since the completion of the dam have fulfilled all expectations, and foreshadow a very large increase in the transport of cotton, cotton seed, and grain by the railways, as also a consequent increase in imports to meet the requirements of the prospering Sudanese landowners.

Future Development.

Brief mention should also be made of the important developments at present taking place at Khartoum and Omdurman. These include the improvement of roads and tramway services and a big electric-power scheme. The most important item, however, is the construction of a bridge across the White Nile connecting Khartoum with the great native town of Omdurman, which possesses the largest market in the country. The bridge, which will consist of seven fixed spans and a swing span, is well advanced, and when completed will afford through connection by road and tramway for goods traffic between the Sudan Government Railways and Omdurman. The only communication at present is by means of a ferry steamer.

The next stage in the extension of the railway system will be the linking up of Kassala with Gedaref and eventually, in all probability, with the southern section of the line at Sennar, passing over the Sennar Dam. Besides opening up a further extensive productive area, such a line would afford an alternative route for the conveyance of the cotton, grain, &c., export traffic to Port Sudan, avoiding the more occupied section between Wad Medani and Atbara, which will be severely taxed during the busy season. The first stage of this new railway has been definitely taken in hand, following the conclusion last summer of the final nego-
tations for a loan for railway development and other Government purposes in the Sudan. This loan is guaranteed by the Home Government under the terms of the Trade Facilities Act. The scheme provides for the extension of the railway from Kassala to Gedaref (135 miles), and the work was commenced in December last. The Gedaref extension necessitates the construction of a steel girder bridge 1,100 ft. long over the River Atbara at Abu Deleig, the contract for which has been let to Dorman, Long & Co. About 14 1/2 miles of track had been laid at the end of last year.

Another probable railway extension is from Rahad to Talodi (at present served by the road transport service from Tonga). The further extension of the railways south-westwards towards the Belgian Congo is the natural sequence of events, but, as has been mentioned, railway construction in this area would be an extremely costly matter, and it is probable that development, at any rate for some years to come, will be confined to road transport.

THE KENYA & UGANDA RAILWAY.

An Interesting Metre-Gauge Railway, 1,128 miles in length, known as ‘The World’s Wonder Line.’ The Railway is State-owned, and since February 3, 1926, has been worked under the control of a High Commissioner of Transport, who is the Governor of Kenya.

The Kenya & Uganda Railway, which now comprises 1,128 route-miles of metre-gauge track, has not had a long history. The original line, called the Uganda Railway, the construction of which did not commence until 1896, was the contribution of Great Britain towards the execution of her obligations under the General Act of the Brussels Conference of July 2, 1890, to which all the Great Powers were parties. When the Brussels Act – constituting a Slave Trade Treaty under Order in Council of May 9, 1892 – came into effect, the authority exercising jurisdiction in the British East African sphere of influence was the Imperial East African Company, working under a charter granted in 1888. This company, although having certain surveys made, did not proceed with the construction of the railway, and following the surrender of its charter to the Imperial Government in 1895. The first rails were laid in July, 1896, and the first train was run through from the coast to the terminus, at Kisumu, on Lake Victoria, on December 26, 1901.

[...]

It is an interesting fact that this railway, which was built purely for sentimental reasons, namely, with the object of breaking the slave trade, should have opened up a large area of comparatively unknown territory which has been found eminently suitable for European settlement, and now comprises a sound commercial undertaking. Kenya Colony comprises a territory with an area of
209,248 square miles, excluding Jubaland (35,812 square miles). The population in 1924 was estimated at 2,475,059, including 11,002 Europeans, 24,771 Asiatics, and 9,753 Arabs: Jubaland has a population of about 16,000. Uganda (area), 110,300 miles, has a total population, estimated in 1924, of 3,145,449, comprising 3,136,769 natives, 7,229 Asiatics, and 1,451 Europeans.

Development of the Railways.

The original railway was from Mombasa to Kisumu, traffic and passengers for Uganda being transported thence by steamship services controlled by the railway and operating round and across Lake Victoria. In 1910 a branch line, then called the Busoga Railway, was built from Jinja, one of the ports on Lake Victoria, to Namasagali, on Lake Kioga, to provide an outlet for traffic from Lakes Kioga and Albert, and traffic from the Cango and Nile district. Recently, owing to the possibilities of development in Kenya and Uganda, the railway has been extended from Nakuru, a point 450 miles from the coast, in a north-easterly direction through the fertile Uasin Gishu plateau, to Mbulamuit, a station midway between Jinja and Namasagali, on the Busoga branch, thus giving a rail alternative to the steamer services from Uganda. This will, in future, be the main Kenya & Uganda Railway. This line crosses the Kenya and Uganda border at Tororo, and taps a large cotton-producing area. It is probable that further extensions in this direction will be built, including a branch line from Tororo to Mbale and Soroti, giving access to the cotton areas on the eastern shores of Lake Kioga. A rail connection is also projected joining Kampala, the business centre of Uganda, with the main line.

Branch lines have been built from Nairobi to Nyeri at the foot of Mount Kenya (112 miles), Magadi Junction to Lake Magadi, the great natural soda lake, providing a connection with the main line for the conveyance of the products of the Magadi Soda Company, and from the main line to Solai, the maize-growing area, and to Kitale, also a rich cereal-producing district. The Voi-Kahe branch is the one-time military railway, and connects the Kenya & Uganda Railway with Tanganyika Territory and the Tanga section of the Tanganyika Railways.

Results of Working.

The following summary shows the growth of the system and the results obtained:

<table>
<thead>
<tr>
<th>Working Expenditure</th>
<th>Net Earnings</th>
</tr>
</thead>
</table>

Anon., 'The Railways of Africa' 233
The Kenya & Uganda Railway, which name was adopted in lieu of “The Uganda Railway,” under the terms of the Kenya and Uganda (Transport) Order in Council, promulgated on February 3, 1926, achieved excellent results on the working for the year 1926. The earnings, for the first time in its history, exceeded £2,000,000, the exact figure being £2,058,710, against £1,993,507 for the previous year, the expenditure for the same periods being £1,216,773 and £1,090,071 respectively. The net receipts were, therefore, £841,937 for 1926 and £903,438 for 1925, an increase in the operating ratio of 4.43 per cent., the net surplus transferred to Betterment Fund, after payment of loan charges, &c., being £207,795 in 1926 against £368,774 during the previous year.

The major portion of the revenue was derived from goods traffic, earnings from this source being £1,634,700. Passenger traffic brought in £256,918, parcels and luggage £51,084, and livestock £10,991. The gross tonnage increased from 1,018,566 to 1,111,193 tons, or 9 per cent.; there was also an increase of 8.5 per cent. in the number of passengers.

The total capital expenditure to December 31, 1926, amounted to £13,338,512, an increase of £1,638,610 compared with the previous year, the major portion of this having been expended on lines under construction and the provision of new rolling-stock.

### Organisation and Administration.

Following a report on the working of the railways a scheme was drawn up for the co-ordination of transport services, and the Secretary of State for the Colonies having approved of the final draft of the Kenya and Uganda (Transport) Order in Council, that Order was brought into operation on February 3, 1926, by joint proclamation of their Excellencies the Governors of Kenya and Uganda. From that date the control, management and working of all railway, port, harbour, wharf and steamship services has been vested in the High Commissioner for Transport, who is the Governor of Kenya; to be administered by him on behalf of both Kenya and Uganda. The High Commissioner is assisted in all matters of policy by a Railway Advisory Council, which is fully representative of Kenya.
and Uganda. The Council comprises two official and two unofficial members for Kenya and two official and two unofficial members for Uganda, with the senior official member for Kenya as chairman.

Early in 1926 the control and working of the Port of Kilindini was placed in the hands of the General Manager of Railways, pending a definite decision by the Secretary of State for the Colonies regarding the future control of the Port. A decision was arrived at early in 1927, as the result of prolonged discussions, and the control is now definitely vested in the General Manager, who reports to the High Commissioner and is assisted by a Port Advisory Board consisting of representatives from Kenya and Uganda and shipping interests.

[...]. The General Manager’s and the Superintendent of the Line’s headquarters staff are combined in one office under the control of the Superintendent, Administrative, who is responsible directly to the General Manager and the Superintendent of the Line. The Superintendent of the Line controls all transportation services, including locomotive running, and is assisted by a Divisional Superintendent in Uganda, and an Assistant Superintendent of the Line and Locomotive Running Superintendent at headquarters. He is also responsible to the General Manager for all rates and fares, a commercial and an operating assistant being stationed at headquarters.

The Chief Engineer, who is also the Deputy General Manager, is in charge of both construction and maintenance of engineering works and the land department. The Mechanical Engineer controls the workshops and is responsible for the maintenance and repair of engines and stock, and jointly controls, with the Superintendent of the Line, the locomotive shed foremen. The Chief Accountant is the principal financial adviser and has the accounts and traffic audit departments under his control. The Marine Superintendent is responsible for the maintenance and navigation of craft on the lakes, the working of the piers being controlled by the Superintendent of the Line, as also the loading and unloading of vessels on the lake. The Port Manager controls the whole of the working at the port of Mombasa, including Kilindini Harbour, Mbaraki, and the old port of Mombasa. The Chief Storekeeper is responsible for the purchase and distribution of all stores, being assisted in regard to purchases by a tender board of senior officials.

The engineering department is divided into four areas, each in charge of a District Engineer, and comprises in all 18 permanent-way inspectors’ sections. The districts are from Mombasa to Makindu and branches, with headquarters at Mombasa; Makindu to Gilgil and branches, with headquarters at Nairobi; Gilgil to Tororo and branches, with headquarters at Nakuru; and Uganda, with headquarters at Jinja (Uganda).

The transportation department is subdivided in the same way with an Assistant Superintendent, assisted by traffic inspectors, in charge of each area. In
Uganda, however, the whole area is in the charge of the Divisional Superintendent, who has an Assistant Superintendent at Jinja.

The Mechanical Engineer’s headquarters are at Nairobi, where the workshops and also the main stores are situated. There are also sub-stores at Kilindini for the reception of stores from overseas and the use of that district; at Kisumu for the marine department; at Kampala for the Port Bell-Kampala Railway; at Jinja for the Busoga Railway; and at Namasagali for the Busoga Railway Marine.

On December 31, 1926, the railway staff numbered 19,046, this being a decrease of 1,576 compared with the previous year. There are 545 Europeans, 2,440 Asians and 2,105 Africans, other than labourers, and 13,956 African labourers. During the year the European staff increased by 10.6 per cent. The artisans employed are exclusively Asiatic and the gangers in charge of the permanent-way gangs are African. A certain number of the Asians and Africans have been trained for simple duties connected with train working, but many of the natives lack a sense of responsibility, and it is a matter of very careful training to make them satisfactory for anything more than labouring.

**Permanent Way and Works.**

While the total route-miles of open lines on the Kenya & Uganda Railway on December 31, 1926, numbered 1,128, the total track mileage, including loops and sidings, amounted to 1,259. The total number of stations and ports on the whole system is 112.

The existing permanent way has been in use for 25 years, and in order to cope with the increasing traffic and to provide a track to carry locomotives with a maximum axle load of 18 tons throughout the whole section between Nairobi and the coast, a programme of relaying with 80-lb. B.S.S. flat-footed rails and steel sleepers with fastenings, weighing 117 lb. each, including 50,000 cub. ft. per mile of ballasting, has been in hand for the past three years. Relaying has now reached Mile 215. It was also found necessary to regrade the line to provide a maximum of 1.18 per cent. compensated, against down traffic. Station yard loops are also being lengthened to 1,400 ft. in order to accommodate longer trains.

A corresponding strengthening of bridges is also involved, and this is being done by replacing the old girders (which were designed for a 10-ton axle load) by heavier girders with trough flooring. In some cases the 40-feet span girders are being quadrupled and new trough flooring fitted to take the ballasted track. Salisbury Bridge, connecting Mombasa Island with the mainland, will eventually be replaced by a combined road and railway bridge consisting of five spans of 60 ft. each in length.

The line is divided into two lengths which may best be described as the ‘plain or surface,’ and the ‘hill sections.’ In the plain sections, Mile 0 to 325, there are
some 630 bridges and other openings, an average of about two per mile. Of these there are about 70 with plate-girder spans varying in length from 6 to 100 ft. Major bridges exist at Tsavo (Mile 131 1/2), Darajani (Mile 174 1/2), Masongaleni (Mile 183), Kefaru (Mile 218 1/2) Stony Athi (Mile 299), and Athi rivers (Mile 309 1/2). The bridges at Tsavo and Stony Athi rivers consist of four plate-girder spans of 60 feet, resting on masonry piers and abutments. Darajani has five spans of 40 feet resting on steel cylinders, Kefaru has four spans of 40 feet on cylinders, and Masongaleni four spans of 40 feet. All these bridges have been strengthened and five major bridges rebuilt. The bridge over the Athi consists of a single Warren truss span of 100 feet with two plate-girder spans of 40 feet on masonry piers and abutments. The main girders in each case are braced together. This is to be replaced with a 100-feet trussed span girder bridge, to be erected on the existing abutments.

In the hill section, between Miles 325 and 589, there are 35 bridges with plate girders of from 10 to 100 feet spans, on either concrete piers and abutments or upon steel cylinders. The largest is that spanning the Morendat river (Mile 394), which consists of one Warren truss span of 100 feet and two plate-girder spans of 20 feet on screw piles and concrete abutments.

The ruling grade on this section is 2 per cent. uncompensated, which represents the heaviest work on the line and reaches an altitude of 8,321 feet at Mau Summit (Mile 489): there are 35 viaducts and a tunnel (at Mile 526) about 170 yards long. The viaducts are all of the same type and consist of trestle bents splayed to a batter of 1-6. The bents are built up of H-irons braced together, carrying 20-feet girders. Between each pair of trestles or bents, or between a trestle and an abutment, rests a 40-feet plate girder. Some of the viaducts have trough flooring and others longitudinal sleepers. In all there are 250 spans of 40 feet and 235 spans of 20 feet, representing a total of about 4,900 lineal yards of viaduct work. New permanent-type station buildings, houses for staff, and goods sheds have been erected at numerous wayside stations.

An up-to-date laundry and ice and mineral water factory are being constructed at Nairobi. These are required to supply bedding and stores for the new corridor stock which is being introduced.

Fuel for locomotive purposes has in the past been mostly wood cut from local forests. Over 25 1/2 miles of sidings, the longest being 10 miles, have been constructed in order to tap supplies.

The Uasin Gishu Line.

This line, which is being extended into Uganda, is laid with 50-lb. B.S.S. flat-footed rails, with steel sleepers and fastenings spaced 12 per 30-feet length of track. The ruling gradient is 1.5 per cent. compensated, and the highest point reached is 9,130 feet above sea level at Mile 70 1/2. The maximum curvature is
ten degrees. The extension is of a somewhat heavy nature, involving heavy banks and heavy cuts in earthwork, and several large bridges up to 60-feet span.

There is also the Nabkoi Viaduct, which consists of ten 20-feet spans and eleven 40-feet spans on trestle bents, the height being 100 feet above the bed of the Nullah. The total weight of the steelwork on this viaduct is 581.69 tons. The steelwork is designed to carry the live loading known as the 'B.B. & C.I.R. 1916 (MG) Standard,' and a speed of 30 m.p.h. was adopted for calculating the stresses due to centrifugal force. The station yards, with their buildings, station machinery, water tanks and towers, are laid out to a standard type. The engine-changing station is at Eldoret, at Mile 124.

Thika-Nyeri Branch.

From Nairobi to Mile 28 the maximum grade on the section has been reduced from 3 per cent. uncompensated to 1.5 per cent. compensated. All temporary wooden bridges have been removed and replaced with steel spans of 40 feet to 60 feet. The extension of the branch from Mile 25 on the old line to Nyeri, a distance of 87 miles, has been completed and handed over for traffic. The distance from Nairobi to Nyeri is 112 miles. The extension of this branch from Nyeri to Naro Moru in the direction of Nanyuki, a distance of 16 miles, is nearing completion.

This branch is laid with 50 lb. per yard rails with steel sleepers and fastenings which have been released from main-line coast sections after relaying. The engine-changing station is at Sagana, 80 miles from Nairobi. The ruling grade is 1.5 per cent. compensated against up and down traffic to Sagana, and from there to Nyeri it is 3 per cent. against up traffic and 2.5 per cent. against down traffic. From Nyeri to Naro Moru, 3 per cent. against up traffic and 1.5 per cent. against down traffic. The maximum degree of curvature is 10 deg., or 573 feet radius to Sagana, and 16 deg. or 359.26 feet radius from Sagana to Naro Moru. The highest altitude reached on this branch is at Naro Moru, being 6,630 feet above sea level. Several large bridges have been built on this line, viz.:—

<table>
<thead>
<tr>
<th>Name of Bridge</th>
<th>Number of Spans</th>
<th>Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ndarugu</td>
<td>One 60-feet and two 40-feet spans</td>
<td>26 ½</td>
</tr>
<tr>
<td>Thika</td>
<td>Two 60-feet and two 40-feet spans</td>
<td>35 ¼</td>
</tr>
<tr>
<td>Saba Saba</td>
<td>One 40-feet, 8 spans</td>
<td>58 ½</td>
</tr>
<tr>
<td>Mathioya</td>
<td>Four 40-feet, 8 spans</td>
<td>74 ¼</td>
</tr>
<tr>
<td>Kabuku</td>
<td>Three 40-feet, 8 spans</td>
<td>42 ¼</td>
</tr>
<tr>
<td>Thara</td>
<td>Three 20-feet, 8 spans</td>
<td>56</td>
</tr>
<tr>
<td>Tana</td>
<td>Three 60-feet, 8 spans</td>
<td>79</td>
</tr>
<tr>
<td>Ragati</td>
<td>Three 20-feet, 8 spans</td>
<td>81 ½</td>
</tr>
<tr>
<td>Maragua Viaduct</td>
<td>Nine 40-feet, seven 20-feet, two 30-feet and one 100-feet lattice girder' central span</td>
<td>79 ¼</td>
</tr>
</tbody>
</table>
The total length of the viaduct at Maragua is 660 feet. The area of opening between abutments is 48,059 square feet. Maximum height of trestle, 100 feet. Total weight of steelwork, 655 tons. Concrete on piers and abutments amounted to 45,000 cub. feet. The station yards are of the standard type lay-out, the buildings being of a permanent type.

The Solai Branch.

From a maize-producing point of view the Lake Solai area is one of the largest in the Colony. The branch takes off the Uasin Gishu branch within Rongai Station (Mile 19) and terminates some 2 2/1 miles due south of Lake Solai, and approximately 300 feet higher than it. The ruling gradient is 1.5 per cent. compensated for curvature at 0.03 per cent. per degree. The maximum curve is 10 deg. and the length of the line is 26.54 miles. Length of sidings, 3.4 miles. The construction was carried out by the Railway Administration, the track being 50 lb. flat-footed rails, laid on steel sleepers, with fastenings released from the main line after relaying with a heavier rail. Lake Solai is a watering and fuelling station. The line was completed and absorbed into open lines on March 13, 1926.

The Kitale Branch.

The construction of this branch was commenced on January 1, 1925. It leaves the Uasin Gishu Branch at Leseru Station Yard (Mile 135) and runs in a northerly direction through the Trans-Nzoia district, to its terminus at Kitale Township, the headquarters of the Trans-Nzoia district. The total length of the line is 40.36 miles, and it is laid with 50 lb. flat-footed type of rail with steel sleepers and fastenings, released from the coast section of main line after relaying.

There are two important bridges on this section spanning the Little Nzoia River at Mile 20 1/2 and the Nzoia River at Mile 27. Both these bridges are one 60-feet and two 40-feet deck span girders on concrete abutments and piers. The ruling gradient is 1.5 per cent. compensated, and the maximum curvature is 10 deg.

Magadi Branch.

This branch was constructed by Pauling & Co. in 1911 for the Magadi Soda Company, and was built in order to convey the soda from Lake Magadi. The junction with the main line is Magadi Junction (Mile 281 1/2), and the track then runs in a westerly direction through the Masai Province and Native Reserve. From Magadi Junction to Kajiado (Mile 26) the line is laid with 50 lb. per yard B.S.S. flat-footed rails on steel sleepers of 75 lb. in weight, there being 2,112 to the mile.
Throughout Kahiado station, which is the engine-changing station and depot, 80 lb. per yard flat-footed rails of British Standard Section are laid on 109-lb. steel sleepers, there being 1,936 to the mile. Similar material is used for the section between Kajiado and the Lake terminus (63 3/4 miles). The curvature is 10 deg. The ruling gradient on the Magadi Junction-Kajiado section are, Up, or in the direction of the Lake, 1.5 per cent. compensated; Down, or in the direction of Magadi Junction, 1.18 per cent. compensated, and on the Kajiado-Lake Magadi section, Up, or in the direction of Kajiado, 2 per cent. compensated, and Down, or in the direction of the Lake, 2 per cent. compensated.

There are several important major bridges and viaducts on this branch, which are as follows:

- Mile 29/9. – One 60-feet deck span on concrete abutments.
- Mile 35/16. – Steel trestle viaduct consisting of twelve 30-feet spans and eleven 15-feet spans on steel trestles with concrete abutments. The permanent way is carried on transverse timber sleepers, let into trough flooring, the viaduct being on a 10-deg. curve.
- Mile 37/17. – Steel trestle viaduct consisting of eight 30-feet and eleven 10-feet spans on steel trestles with concrete abutments, similar in construction to that at Mile 35/16.
- Mile 40/12. – Three 30-feet deck span girders erected on concrete abutments and piers, on a 10-deg. curve.
- Mile 49/16. – Four 40-feet deck span girders erected on concrete abutments and piers.

The station yards are of the Kenya & Uganda Railway standard, the station buildings being built in wood and iron.

**Voi-Kahe Branch.**

This branch was originally constructed as a military line during the war to a junction with the Tanga Railway at Kahe, a length of 91 miles. and was taken over by the Kenya & Uganda Railway Administration at the beginning of 1924, with running powers from Kahe to Moshi. A considerable sum of money has been expended in putting this line in order. Grades have been reduced from 4 to 3 per cent. Many additional water openings have been added and temporary trestles and crib work under bridges have been removed and replaced with concrete. New buildings have been erected at stations.
The Busoga and Kampala Branches.

The Busoga line is situated in Uganda, and forms a connection between Lake Victoria at Jinja and Namasagali, on Lake Kioga, a distance of 61 1/4 miles (metre gauge), with headquarters at Jinja, one of the important ports on the lake. The line is laid with 50-lb. flat-footed rails with steel sleepers and fastenings. There are engine-changing stations and workshops at Jinja and Namasagali. There are no major bridges of any importance, the waterways and openings being pipes and culverts. The ruling gradient is 1 per cent., and the maximum degree of curvature 10 deg. The Kampala line is a short railway that connects Port Bell with Kampala, the commercial capital of Uganda. It is six miles long on the metre-gauge and is built to a ruling gradient of 1 per cent., with a maximum degree of curvature of 10 deg. It is laid with 50-lb. flat-footed rails on steel sleepers and fastenings.

The Uganda Extension.

This is an extension of the Uasin Gishu Line into Uganda, and is divided into two sections: Turbo to Malaba River, length 78 miles; and Malaba River to Mbulamuti, length 105.75 miles. The construction of the Uasin Gishu Branch has given an impulse to the development of the Uasin Gishu District.

Preliminary and detailed surveys were made during 1924, and construction was commenced in April, 1925, the first section of the line from Turbo to Broderick Falls being completed and handed over to traffic on July 1, 1927. The earthworks are practically completed, so also is the construction of the major bridges throughout the whole length of the new extension, which should be completed early in 1928.

The ruling grade is 1 per cent. compensated and the maximum degree of curvature is 10 deg. The Kenya & Uganda Railway standard profile for banks and cuttings has been adopted. Banks are 14 feet in width at formation level, with slopes of 1 1/2 to 1. The permanent way is 50 lb. per yard B.S. section flat-footed rails with steel sleepers and keys weighing 75 lb. each. The average number are sleepers per mile is 2,112. Stations and station buildings all conform to standard type and are built in concrete block with tiled roofs. Cranes, weighing machines, ramps and interlocking signals are being installed. A three-wire air line telegraph is being installed throughout the length of the extension, and also a complete installation of Tyers tablet instruments for line working.

The Soroti Branch.

A survey from Tororo for a proposed branch in the direction of Mbale, Kumi and Soroti, which lies in a north-westerly direction towards the White Nile, was made during 1926. The construction of this line was commenced in February,
1927. The length of the line is 98 1/2 miles, with a ruling gradient of 1 per cent. compensated, and a maximum degree of curvature of 7 deg., or 819-feet radius. The track is metre-gauge and laid with 50-lb. B.S.S. flat-footed rails on steel sleepers and fastenings, weighing 75 lb. each. The major bridges are three spans of 40 feet and ten spans of 60 feet. The others are pipe drains and arch culverts. This branch may ultimately be extended in the direction of the White Nile.

A preliminary survey of the Thomson Falls line has also been completed, and this survey is now being staked out. Surveys have been made for the Kericho to Sotik and Kisumu to Yala, or the proposed line to North Kavirondo.

**Locomotives and Rolling-Stock.**

On December 31, 1926, the Kenya & Uganda Railway had 165 locomotives on the books, the principal being four Garratts of the 4-8-2 + 2-8-4 type, with a tractive effort of 35,500 lb. and an axle load of 10 tons, built by Beyer, Peacock & Co. Ltd. There are also 38 G.D. class 4-8-0 type superheated locomotives with a tractive effort of 20,400 lb., and an axle load of 10 tons, 18 Mallet class 3 0-6-6-0 type with a tractive effort of 23,600 lb., and an axle load of 10 tons, with H.P. cylinders of 15 1/2 in. by 20 in. and L.P. cylinders of 24 1/2 in. by 20 in. The cylinders of the Garratt type are 16 1/2 in. by 22 in. and of the G.D. class 18 in. by 22 in.

There are also 21 shunting tank engines of the 2-6-2 type with 15 in. by 22 in. cylinders, 11.25 tons axle load, and a tractive effort of 13,800 lb. at 75 per cent. Six Mikado engines of the 2-8-2 type with double bogie tenders, built by R. Stephenson & Co. Ltd., are now in course of erection, with driving wheels 4 feet 3 in., 33,467 lb. tractive effort, axle load of 18 tons, and will work on the newly-laid 80-lb. rail between the coast and Makindu.

Most of the engines consume wood fuel, but some are fitted for oil burning, notably those in the Coast area. Coal is not at present available in the Colony, but some is imported and used, principally in the Garratt class, and some of the G.D. type engines.

The coaching stock numbers 305 units, the first-class bogie coaches providing seating accommodation for 24 and sleeping accommodation for 16. The second-class bogies accommodate 16 passengers for sleeping with seating space for 20. The third-class bogies, provided mainly for Africans, accommodate 112. All the stock is non-corridor, but 10 first-class and 10 second-class bogie corridor coaches are in course of erection, with three dining cars complete with modern equipment for comfortable and even luxurious travel.

The freight stock numbers 2,851 vehicles, 680 of these being bogie covered goods wagons with an average carrying capacity of 21 1/2 tons and a tare of 11 tons. Other principal classes are 250 bogie high-sided wagons of 21 1/2 tons average capacity, 81 bogie low-sided wagons of 25 1/4 tons capacity; and 194 low-sided iron trucks of 10 tons capacity. In addition, there are 104 10-ton rail and timber trucks, 92 water tanks of approximately 10 tons capacity, and 47 covered cattle wagons of 10 tons capacity.
Workshops and Equipment.

Extensive locomotive and carriage workshops exist at Nairobi (Headquarters), where heavy and light repairs are carried out. These workshops are, at the present, undergoing a process of modernisation and extension.

Particulars of some of the principal buildings, which are of steel-frame construction, are given below:

<table>
<thead>
<tr>
<th>Description of Work or Name of Shops</th>
<th>Size.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine shop, smiths’ shop, fitting shop, brass shop, tool room, coppersmith’s shop, Westinghouse brake shop, tube shop and tool store</td>
<td>Three 40-feet spans, 400 feet long, with a lean-to 30 feet wide and 400 feet long.</td>
</tr>
<tr>
<td>Loco. store and pattern shop</td>
<td>Main building 28 feet high.</td>
</tr>
<tr>
<td>Machine shop for wheels and electricians’ fitting shop</td>
<td>60-feet span, 400 feet long, 35 feet high.</td>
</tr>
<tr>
<td>Wagon shop and manufacturing shop</td>
<td>40-feet span, 207 feet long, with a lean-to 207 feet long, 17 feet high.</td>
</tr>
<tr>
<td>Saw mill</td>
<td>Two spans of 60 feet and 220 feet long.</td>
</tr>
<tr>
<td>Carriage lifting shed</td>
<td>60-feet span, 200 feet long.</td>
</tr>
<tr>
<td></td>
<td>270 feet long by 35 feet span.</td>
</tr>
</tbody>
</table>

There is also a large workshop yard with siding facilities and an inspection pit 500 feet long.

A change-over from steam power to electricity has been made, so effecting considerable improvement in the execution of repairs, &c. The existing headquarters offices, consisting of wood and iron buildings, which have done service for 25 years, are now being replaced by a substantial block of stone offices, for which the foundations were commenced at the end of 1926.

The whole of the workshops are electrically driven, the current being of 415-volt, 3-phase, 50-cycle, alternating current, being transformed from E.H.T. 10,000 volts in the railway sub-station.

The out-turn¹ for the years 1925, 1926, and the estimated out-turn for 1927, of locomotives, coaching stock and goods stock, were:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy Repairs –</td>
<td>Units.</td>
<td>Units.</td>
<td>Units.</td>
</tr>
<tr>
<td>1925</td>
<td>37</td>
<td>104</td>
<td>504</td>
</tr>
<tr>
<td>1926</td>
<td>32</td>
<td>144</td>
<td>576</td>
</tr>
<tr>
<td>1927 (estimated)</td>
<td>57</td>
<td>147</td>
<td>465</td>
</tr>
<tr>
<td>Light Repairs –</td>
<td>Units.</td>
<td>Units.</td>
<td>Units.</td>
</tr>
<tr>
<td>1925</td>
<td>24</td>
<td>81</td>
<td>183</td>
</tr>
<tr>
<td>1926</td>
<td>34</td>
<td>34</td>
<td>199</td>
</tr>
<tr>
<td>1927 (estimated)</td>
<td>26</td>
<td>33</td>
<td>166</td>
</tr>
<tr>
<td>Stock Erected –</td>
<td>Units.</td>
<td>Units.</td>
<td>Units.</td>
</tr>
<tr>
<td>1925</td>
<td>18</td>
<td>10</td>
<td>992</td>
</tr>
<tr>
<td>1926</td>
<td>47</td>
<td>2</td>
<td>206</td>
</tr>
<tr>
<td>1927 (estimated)</td>
<td>6</td>
<td>120</td>
<td>Nil.</td>
</tr>
</tbody>
</table>

In the machine shop there are some special machines which are capable of dealing with all classes of work, such as a surface grinding machine (Craven Bros. (Manchester) Ltd.); circular grinding machine (Churchill Machine Tool Co.
lapping machine (Beyer, Peacock & Co. Ltd.); crankpin turning machine (Pearn-Richards); universal milling machine (A. J. Parkinson & Sons); vertical milling machine (Kendall & Gent Limited); big 20-in. stroke slotting machine capable of taking a 1/2 in. cut (Buckton & James); 7-feet radial drill, which swings and drills at any angle, and capable of boring a 6-in. diameter hole (Wm. Asquith Limited); and a double tool planer, which is automatic, self-acting, and able to take a 3/4 in. cut on each tool (Armstrong, Whitworth & Co. Ltd.). In addition, there are also tyre-turning lathes, by Dean, Smith & Grace, and Hulse & Co. Ltd., and a journal lathe by James Spencer.

In the smithy there is a battery of steam hammers (Massey, Pilkington & Thwaites). These hammers are 5 cwt., 7 1/2 cwt., 10 cwt., 12 cwt., and two 20 cwt. There is a bolt and nut-making machine (Greenwood & Batley), a forging machine (Ryders), a chain-annealing furnace (New Alldays & Onions Limited), a 20-ton spring-testing / machine (W. & T. Avery Limited), a hydraulic spring and buckle press (Berry), a modern spring-making machine, and a baling and piling furnace (New Alldays & Onions Limited).

The sawmill is fully equipped to deal with all classes of Kenya timber, and the machines, which include a horizontal log band saw, moulding, planing, bandsawing and fretsawing machines, and also all the machines in a well-equipped saw shop capable of dealing with large bandsaws and circular saws, have all been supplied by T. Robinson & Sons Ltd., of Rochdale. A three-chambered timber-drying kiln by Sturtevant is in course of erection, and when completed will be capable of handling 400 tons of timber per annum.

The Marine Department. 

The Marine Department of the Kenya & Uganda Railway administers both the Uganda Railway Marine on Lake Victoria and the Busoga Railway Marine on Lake Kioga. Both are under the charge of the Marine Superintendent at Kisumu, under whose orders is the Superintendent of the Busoga Railway Marine, stationed at Namasagali. On the engineering side there is a Chief Marine Engineer at Kisumu, who is under the Marine Superintendent, and an engineer at Namasagali for the fleet on Lake Kioga.

The Uganda Railway Marine, on Victoria Nyanza, consists of six vessels, ranging from a displacement tonnage of 1,200 to 700; one powerful tug, the Kavirondo, of 400 I.H.P.; one smaller tug, the Percy Anderson, of 120 I.H.P.; one small 50-ton steamer, the Husseni; and one 70-ton steamer, the William Mackinnon, which belongs to the Uganda Government, but is operated on their behalf by the Kenya & Uganda Railway. All the above are single or twinscrew vessels. Their draught is limited to 7 feet, owing to the shallowness of the Gulf of Kavirondo.
A weekly mail and passenger service is maintained, leaving Kisumu every Sunday, calling at Entebbe, Port Bell and Jinja, and returning to Kisumu on the following Thursday; cargo is also carried. This service is performed by the ss. *Clement Hill*, which has cabin accommodation for 30 first-class and 20 second-class passengers and 450 tons of cargo. In addition to this service, the steamers *Usoga* and *Rusinga*, of 1,200 tons, make fortnightly trips round the lake, touching at Mwanza and Bukoba, in Tanganyika territory, Bukakata, Entebbe, Port Bell and Jinja, in Uganda.

Mails, passengers and cargo are carried, and the trip is made alternatively north and south about.

**Port Working.**

Two new deep-water berths were opened at the Port of Mombasa, which includes Kilindini Harbour, in 1926, and ships berthed alongside, commencing with the ss. *Clan Mackenzie*, on July 28, 1926. From that date until the end of 1926, 34 ships were berthed, 36,349 tons of cargo landed, and 8,087 tons shipped direct to and from the quay.

The total area of ground covered by the new quay, transit shed, stacking grounds and roads, is about 13 acres. Further extensions to the port have been authorised, together with modern equipment, which will give facilities for berthing five ships at a time.

**Traffic and Train Working.**

Practically the whole of the railway is now equipped with Tyer's tablet working, and a certain number of stations have been equipped with interlocking apparatus.

Train-ordering, operation and wagon supply are controlled from headquarters at Nairobi, and early in 1926 a modified form of central control was inaugurated. There are at present no long-distance telephones in the Colony, and all communications between the control office and stations are conducted by means of telegraph, the instruments being operated by Africans.

The introduction of the central control system has been fully justified; a steady decrease in train-mileage has been maintained in spite of increases in the tonnage carried and the track-mileage operated. The freight train-mileage for December, 1926, was 127,820, compared with 168,227 for January of the same year, a decrease of 40,407 train-miles, or 24 per cent., and a decrease of 32 per cent. on December, 1925. The total engine-mileage for the year exceeded the estimate by 0.05 per cent., and was only 6.55 per cent. in excess of the mileage for 1925, whereas the tonnage lifted was 10 per cent. in excess of 1925. In December, 1925, the average gross train load was 215 tons; in December, 1926, the net train load was 20 units 118 tons, which gives a gross load of 240 tons, an increase of 25 tons,
or 11.11 per cent. From July, 1926, a record was kept of the average starting point vehicle load, which increased from 9.69 in August to 11.1 tons in December.

In the earlier part of 1926 a system of banking trains from Kilindini to Mazeras was introduced in order to maintain full train loads from the port to Nairobi and to reduce marshalling and shunting costs en route due to break of load. The method proved successful and resulted in reducing the average transit time between the coast and Nairobi, in addition to effecting a decrease in train-mileage.

The engine-miles per engine per day are 90.89. The length of the usual engine section is 100 miles, but in the coast section a system of pooling engines has been introduced extending the engine runs to 207 miles, and has worked quite satisfactorily in spite of the fact that European, Asian, and African drivers are employed. The fuel consumed during 1926 was: coal, 40,989 tons; wood, 91,252 tons; and oil, 7,281 tons.

The principal stations are Mombasa, the terminus at the coast; Nairobi, the seat of Government and the headquarters of the railway, Nakuru, the junction between the Kisumu line and the line to Uganda; Eldoret and Tororo, on the Uganda line; and Kisumu, the terminus, on Lake Victoria.

A mail service is maintained on the main line four days a week, with special boat trains running in conjunction with the arrival of passenger ships at the port; daily mixed services are run in the more thickly populated areas. It is hoped that in the near future it will be possible to introduce a daily mail train service between the coast and Nairobi, the journey being performed in 18 hours.

The freight trains are all conditional, but a service of four trains in each direction is usually maintained between Nairobi and the coast. The tonnage of the principal classes of freight conveyed during the year 1926 were: maize, 48,126 tons; soda ash, 14,023 tons; ginned cotton, 33,976 tons; cotton seed, 34,346 tons; and oil seeds, 17,531 tons.

During the earlier part of 1927 a record tonnage of seasonal crops was handled. A few comparative figures are given below:

<table>
<thead>
<tr>
<th></th>
<th>Revenue Earning Tonnage Railed</th>
<th>Freight Train Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1927.</td>
<td>1926.</td>
</tr>
<tr>
<td>January</td>
<td>63,952</td>
<td>46,825</td>
</tr>
<tr>
<td>February</td>
<td>69,147</td>
<td>45,199</td>
</tr>
<tr>
<td>March</td>
<td>81,510</td>
<td>48,587</td>
</tr>
<tr>
<td>April</td>
<td>75,567</td>
<td>42,056</td>
</tr>
<tr>
<td>May</td>
<td>74,598</td>
<td>43,904</td>
</tr>
<tr>
<td>June</td>
<td>64,322</td>
<td>46,243</td>
</tr>
<tr>
<td>Total</td>
<td>429,096</td>
<td>272,814</td>
</tr>
</tbody>
</table>

A road motor service is maintained in Uganda between Masindi port and town and Butiaba, with headquarters at Masindi port.

The fleet consists of 14 2-ton Albion vans, four 4-ton Albion vans, one Albion passenger van, one 3-ton Daimler van, four 1-ton Morris vans, and six 1-ton trailers. The tonnage carried in 1926 was 7,500 tons, compared with 6,757 in 1925.
Stores Working.

The tonnage of stores and material received from overseas and dealt with by the Stores Department during 1926, excluding locomotive fuel, amounts to 53,088 tons, compared with 78,929 for the preceding year. A large number of the railway staff draw rations, and during 1926, 1,565 Indians and 183,904 Africans were provided with rations issued by the Stores Department.

The total turnover for the year 1926 amounted to £3,562,967. The value of stores on hand at the end of 1926 was £459,041.

THE NIGERIAN RAILWAY.

A System of 1,466 route-miles of 3-feet 6-in. gauge line, and 133 route-miles of 2-feet 6-feet gauge, which links up Kano, via Kaduna, with the ports of Lagos and Port Harcourt. An operating ratio of 59.20 per cent. helps the Administration to show highly satisfactory results. Train Ferries and the working of Coal Mines are included in the Railway Activities.

[...]

The Nigerian railway system, which formerly comprised two disconnected connected systems based on Lagos and Port Harcourt, was recently consolidated by reason of an extension of the Eastern line from Makurdi to Kaduna, where connection is made with the main line from Lagos to Kano. The terminus of the Western line of the Nigerian Railway is on Iddo Island in the Lagos Lagoon; there is no rail connection with the town of Lagos itself. At Iddo are wharves for the reception of the smaller ocean craft and barges, deep-water wharves used for the mail boats being situated at Lagos and Apapa. Four deep-water wharves, capable of taking the largest boats engaged in the West African trade, were completed in 1926 at Apapa, on the opposite shore of the lagoon to Lagos, and the four berths were available for shipping early in 1927. The construction of these wharves was not under the charge of the railway. From Iddo Island the line is carried by a stone causeway to the mainland at Ebute Metta, which is connected to Apapa by a branch line.

Historical Survey.

The system now comprises 1,600 route-miles of line, and is indicated on the map on page 81. Known originally as the Lagos Railway, the first section of line – from Iddo to Ibadan, a distance of 123 (since reduced to 119 1/2) miles – was opened for traffic in 1901, while a few years later, an extension from Ibadan to Iwo, 29 1/2 miles, and forward to Oshogbo, a further 32 1/2 miles, was brought into service. In August, 1908, an extension from Oshogbo to Ilorin, 61 miles, was opened, this line being carried on to Jebba, a section of 59 miles in length, in 1909. From Jebba the line was pushed on in a north-easterly direction to Zungeru, whence a short new section connected with the Baro-Kano Railway at Minna in 1912, and thus provided a through route from the chief centres of trade in Northern Nigeria to the coast at Lagos. The Baro-Karo Railway, 353
miles in length, which was built by the Northern Nigerian Government for military and political purposes, and completed in 1912, connected the capital with the River Niger, on which traffic passed down to the coast. In 1912 this railway and the Lagos Railway were combined under the name of the Nigerian Railway.

Prior to January, 1916, there was no rail connection between the lines north and south of the River Niger at Jebba, and traffic was conveyed across the stream by means of a ferry capable of carrying six large wagons or four passenger coaches at a speed of 7 knots per hour. This method of transport was abandoned in January, 1916, on the completion of a bridge over the River Niger at Jebba, as through rail connection was then established.

In 1913, following the discovery of the Udi coalfields, the construction of an eastern railway, running in a northerly direction, was commenced in sections from Port Harcourt, on the Bonny River, to Makurdi, a distance of 290 miles, on the River Benue. This river is crossed by means of a train ferry, and the line has since been extended to Kaduna, where it connects with the western main line. On this line a branch has been built from Kafanchan to Bukuru, 53 miles, while the line between the latter place and Jos has been converted from the 2-feet 6-in. to the 3-feet 6-in. gauge.

Apart from the Bauchi Light Railway, which runs from Zaria to the tin-fields on the Bauchi plateau, and which comprises 133 miles of line and, with loops and sidings, 140 track-miles of 2-feet 6-in. gauge track, the whole of the system is on the 3-feet 6-in. gauge. The western main line from Iddo Island, in the Lagos Lagoon, extends 704 1/2 miles, while the eastern main line from Port Harcourt to Kaduna is 569 miles long.

Starting from Lagos and proceeding to Kano, the Western line for about the first 200 miles runs through a thickly populated country, the main products being palm kernels, cocoa, palm oil, and cotton. For the next 300 miles the population is scanty and the traffic small, except that the branch to Baro serves a large population, living in a district with good soil and producing much native produce. North of Zaria the population again becomes very dense, the principal exports being groundnuts, hides and skins, and cotton. The Bauchi Light Railway (2-feet 6-in. gauge) serves a cotton-growing district and a small tin-producing area. The railway motor transport services operate from Zaria and convey traffic to and from the large ginneries of the British Cotton-Growing Association, which are at present not served by railway, and also bring in other produce.

On the Eastern division there is a considerable export traffic in palm oil up to a distance of about 90 miles from the coast. At Enugu (151 miles from the coast) there is a railway-owned colliery, the output from which is at present in the neighbourhood of 360,000 tons per annum. This coal is exported via Port Harcourt, and a large tonnage is consumed by the tin mines near Jos, which is at the extreme northerly end of the Eastern division. This is the centre of the
tin fields, and some 11,000 tons of tin per annum are shipped, while the mines import large quantities of material. The eastern line north of the River Benue has only recently been completed, and time must elapse before the country can be fully developed.

The working of the Nigerian Railway and Udi coal mines for the year ending March 31, 1927, was highly satisfactory. The total capital cost of the Nigerian Railway at the end of the financial year was £14,327,361, an average of £11,325 per mile. Gross receipts were £2,396,011, against £2,353,464 the previous year, while the corresponding expenditure figures were £1,418,625 and £1,206,787. The operating ratio in 1926–27 was 59.20 per cent., against 51.28 per cent. in 1925–26. Both passenger and freight traffic showed substantial increases, 2,621,432 passengers being carried in 1926–27 as against 2,413,113 the previous year, and 948,304 tons of freight, as compared with 797,279 tons. The percentage of net profit to capital in 1926–27 was 6.82, against 8.08 the previous year. The results for the past 10 years are given in the table on page 86.

<table>
<thead>
<tr>
<th>Year</th>
<th>Miles Open (Mean Mileage)</th>
<th>Number of Stations</th>
<th>Train Mileage</th>
<th>Gross Earnings</th>
<th>Working Expenses</th>
<th>Net Earnings</th>
<th>Operating Ratio</th>
<th>Profit on Capital Invested</th>
</tr>
</thead>
<tbody>
<tr>
<td>1917</td>
<td>976 101</td>
<td>1,429,518</td>
<td>1,030,711</td>
<td>553,855</td>
<td>476,856</td>
<td>373,855</td>
<td>53.73</td>
<td>6.83</td>
</tr>
<tr>
<td>1918</td>
<td>1,120 125</td>
<td>1,727,526</td>
<td>1,252,647</td>
<td>740,684</td>
<td>511,963</td>
<td>59,13</td>
<td>59.13</td>
<td>5.65</td>
</tr>
<tr>
<td>1919</td>
<td>1,126 127</td>
<td>1,754,773</td>
<td>1,466,872</td>
<td>843,767</td>
<td>623,105</td>
<td>57,15</td>
<td>57.52</td>
<td>6.71</td>
</tr>
<tr>
<td>1920</td>
<td>1,126 128</td>
<td>1,768,069</td>
<td>1,626,799</td>
<td>1,041,523</td>
<td>585,296</td>
<td>64.02</td>
<td>57.52</td>
<td>5.63</td>
</tr>
<tr>
<td>1921</td>
<td>1,126 130</td>
<td>662,579</td>
<td>364,214</td>
<td>287,613</td>
<td>76,601</td>
<td>78.97</td>
<td>78.97</td>
<td>–</td>
</tr>
<tr>
<td>1921–22</td>
<td>1,126 134</td>
<td>1,759,839</td>
<td>1,438,763</td>
<td>1,126,726</td>
<td>312,037</td>
<td>83.31</td>
<td>2.95</td>
<td>–</td>
</tr>
<tr>
<td>1922–23</td>
<td>1,126 138</td>
<td>1,691,508</td>
<td>1,425,812</td>
<td>978,110</td>
<td>447,702</td>
<td>68.60</td>
<td>3.52</td>
<td>–</td>
</tr>
<tr>
<td>1923–24</td>
<td>1,126 138</td>
<td>1,826,982</td>
<td>1,653,115</td>
<td>902,048</td>
<td>751,067</td>
<td>54.57</td>
<td>54.57</td>
<td>5.84</td>
</tr>
<tr>
<td>1924–25</td>
<td>1,220 148</td>
<td>2,064,008</td>
<td>2,052,905</td>
<td>948,902</td>
<td>1,104,003</td>
<td>46.22</td>
<td>46.22</td>
<td>7.38</td>
</tr>
<tr>
<td>1925–26</td>
<td>1,265 148</td>
<td>2,374,416</td>
<td>2,353,464</td>
<td>*1,206,787</td>
<td>1,146,677</td>
<td>51.28</td>
<td>51.28</td>
<td>8.08</td>
</tr>
<tr>
<td>1926–27</td>
<td>1,265 148</td>
<td>2,623,818</td>
<td>2,396,011</td>
<td>*1,418,625</td>
<td>977,386</td>
<td>59.20</td>
<td>6.82</td>
<td>/</td>
</tr>
</tbody>
</table>

Organisation and Administration.

Like other railways in British African possessions, the railway is administered under the control of the Secretary of State for the Colonies, through the resident Governor. The management in the Colony comprises a General Manager (Mr. E. M. Bland) and the usual departmental chief officers, the system being operated on a compromise between the departmental and divisional schemes. The headquarters of the railway are at Ebute Metta, where also the principal workshops are located. The engineering departments are under the usual technical heads, but the working departments are merged in a Transportation Branch.
The transportation scheme of organisation was brought into force on February 1, 1926. It was formed by the amalgamation of the locomotive running section of the Chief Mechanical Engineer’s Department, the Traffic Department (goods, coaching, and operating), and the Motor Transport Department. The Transportation Department also controls dock working at Lagos and Port Harcourt. The department is under the control of the Superintendent of the Line, with headquarters at Ebute Metta (a suburb of Lagos). He is assisted by two Assistant Superintendents of the Line – one for traffic operation and commercial matters, and one for locomotive working. The line is divided into three divisions, each in charge of a Divisional Superintendent, assisted by Assistant Divisional Superintendents as follows:–

**Western Division.**

Lagos to Zungeru inclusive, 435 miles, with headquarters at Ebute Metta Junction.

**Northern Division.**

Zungeru exclusive to Kano, the Baro Branch, and the Bauchi Light Railway, 524 miles, with headquarters at Zaria. The Motor Transport Department is also under the control of Divisional Superintendent, Zaria.

**Eastern Division.**

Port Harcourt to Jos and Kaduna Junction, 632 miles, with headquarters at Port Harcourt.

So far as the domestic organisation of each division is concerned, this varies slightly [...] It may be of interest to note that, for example, at Offa and Minna, which may be regarded as ‘key points’, one Assistant Locomotive Superintendent and one Assistant Traffic Superintendent were stationed at each point prior to the inauguration of the Transportation Department, whereas one officer now controls both traffic and locomotive work at each place. This officer is responsible for all sections of the work at these points, but has no jurisdiction over other parts of the line, thus enabling him to concentrate on the work done at the key points.

The staff of the divisional offices under the new conditions is less than the combined staff of the former traffic and locomotive district offices, and a substantial saving has been realised in respect of African office staff.

The new organisation has proved a great success, and the following are some of the advantages which have been found to accrue:–

(i) The saving in staff has already been mentioned. The whole organisation is an elastic one and capable of expansion without corresponding expense. For instance, 332 miles of new line were added to the Eastern Division at
the beginning of April, 1927. Under the old organisation, District Locomotive Superintendent’s and District Traffic Superintendent’s offices would have had to be created to control such a length of line as this.

(ii) The use and distribution of engine power has been greatly improved by the amalgamation of the former separately controlled Locomotive and Traffic Departments.

(iii) Train ordering is more scientifically carried out. The number of officers ordering trains has been reduced, and the fusion of interests has enabled a closer relationship to be maintained between the traffic to be moved and the power available.

(iv) As a result of the powers granted to Divisional Superintendents, correspondence has been saved, work accelerated, and the preparation of statistics simplified.

(v) Better supervision has been achieved – firstly, by reason of the alteration in the organisation whereby certain officers have been confined to the control of key points; and secondly, owing to the fact that the Divisional Superintendent is on the spot and the Assistant Divisional Superintendents (Locomotive and Traffic) now belong to the same department and can thus, when inspecting, report upon or put right faults connected with the working of the railway. Under the old organisation each officer confined himself to the work of his own department.

(vi) The fact that an officer with increased powers is in charge of a division has improved discipline, saved time, and ensured the fusion of interests.

The total staff of the railway on March 31, 1927, was 15,624, comprising 425 Europeans, 11,695 African and West Indian staff, 2,722 artisans, &c., and 10,782 labourers.

**Permanent Way and Works.**

The total track maintained, all single line, is 1,600 route-miles and 208 miles of sidings. The system is divided into three sections, with a Divisional Engineer in charge of each under the Chief Engineer. The latter has control of all new works on the system and the location survey of new lines, a programme of about 150 miles per annum having recently been formulated. The construction of new lines is undertaken by a separate department. The rails used throughout are the F.B. type, British standard specification, but for all new lines and relaying the revised British standard is being adopted.

Steel trough sleepers of the key and lug pattern are used, but a new type with a bolt and clip has been adopted recently for new lines and relaying. Native timber sleepers are used for bridges and crossings and are found to give very good service. Most of the line is ballasted with granite stone, the standard for top
ballast being from 1/2 in. to 1 1/2 in. Laterite is used on some sections, more particularly on branch lines.

European foremen supervise sections varying from 30 to 60 miles. These sections are in charge of native gangers, who control lengths of about 4 miles. The average number of trackmen per route-mile is 3-28, and per track-mile, including sidings, is 3-12. Training of native foreman platelayers is making steady progress, and in consequence a gradual decrease in the number of European platelayers takes place every year.

The number of bridges with spans varying from 15 feet to 60 feet is 240, and of 100-foot spans and over there are 16. The largest bridge crosses the Niger river at Jebba, where the river is divided into two channels by Jebba Island. The southern bridge consists of seven through lattice girder spans of 185 feet each between centre of bearings, with three 30-feet concrete arches at each end. The second, which connects the island with the northern bank, consists of two half-through lattice girder spans of 150 feet and two of 105 feet, with two 30-feet arches at each end. At Makurdi, on the Benue river, where it is feared the formation of sand banks will interrupt the working of the train ferry, it is proposed to construct a bridge which will be about half a mile in length.

From Iddo to Ibadan, mile 120, the track is laid with 80-lb. rails, 40 feet in length, with 16 sleepers to the rail length. Maximum gradients are 1 per cent. and 1.25 per cent. respectively, against exports and imports. The maximum curvature is 8 deg., compensated. From Ibadan to Jebba, mile 303, the rails used are 55-lb. section, with 12 sleepers to the 30-feet rail. The maximum gradient is 1.25 per cent. in both directions, the sharpest curve being 8 deg., non-compensated. Between Jebba and Minna, mile 462, the track consists of 45-lb. rails, with 12 sleepers to the 30-feet rail. The maximum gradients are 1.25 per cent. against imports and 1 per cent. against exports, except for a short section of 38 miles between Zungeru and Minna, where grades of 1.25 per cent. occur in both directions. Maximum from Minna to Kano, mile 705. The maximum gradient to Zaria, mile 617, is 1.65 per cent., and from Zaria to Kano, 1.25 per cent. in both directions in each case. The maximum curvature on the lines north of Minna is 10 deg.

The section between Kaduna and Zaria (51 miles) is being realigned and regarded, so as to conform to the standard gradients and curvature of the Eastern system, and 60-lb. track will replace the present 45-lb. material. This work necessitates deviating portions of the line and strengthening bridges, and will permit of the 12 1/2-ton axle-load being worked between Port Harcourt and Zaria, a distance of 619 miles.

The Eastern line runs from Port Harcourt to Kaduna Junction, 569 miles, and is built to standard gradients of 1 per cent. and 1.25 per cent. respectively, against exports and imports. The maximum curvature is 10 deg. 60-lb. rails are
used throughout, those north of Makurdi being 33 feet in length, with 13 sleepers per rail length. On the lines south of Makurdi 30-feet rails are used.

Branches.

A branch four miles long joins the main line at Ebute Metta Junction station with Apapa. It is laid with 80-lb. track, and connects with the deep-water wharves at Apapa, where all freight and mail steamers now call. At Ifo Junction, mile 27, a short branch of three miles is laid with 50-lb. material to Ifo. This branch is to be extended shortly, through Ilaro to Idogo, a distance of 24 miles. A short branch of two miles connects the town of Abeokuta with Aro station, mile 58. A branch 111 miles in length runs from Minna to Baro on the Niger River, and is laid with 45-lb rails. The gradients are 0.7 per cent. in the direction of Baro and 0.8 per cent. towards Minna.

From Zaria a 133 miles 2-feet 6-in. gauge line runs to Jos, the centre of the tin-mining industry. The maximum gradient is 2 per cent. and curvature 12 deg., but on a short section of the hilly country 14-deg. curves are used. Rails used are 30-lb. section, 24 feet long, with nine sleepers per rail length. Jos station is served by another branch line 63 miles long, from the station of Kafanchan, mile 456, on the Eastern system. The gauge is 3 feet 6 in. It is laid with 60-lb., 55-lb. and 50-lb. rails, the latter two classes of rails having been released from the Iddo-Ibadan section. The maximum grade is 2 per cent. and curvature 12 deg. From Enugu a branch line of 6 1/2 miles serves the collieries, which have a big and increasing output.

A branch line is being constructed from Zaria to Gusau, 107 miles, to tap the cotton areas of Sokoto and Katsina Provinces. It is proposed to extend this line northwards to Kaura Namoda, a distance of 33 miles. This branch is being constructed to standard gradients, the standard curve of 8 deg. being observed, and it is expected to be open for traffic as far as Gusau in 1928. The rails are 60 lb., in 33-feet rail lengths. Another branch line is in course of construction from Kano towards Hadeija, and when completed will be about 110 miles in length.

Preparations are being made to relay the section of line from Ibadan to Offa, 95 miles, with 80-lb. permanent way material, thus forming a continuous working section of 215 miles from Iddo with the heavier track, and permitting the employment of engines with an axle load of 16 ½ tons.

Signalling.

Over the greater part of the system single-line working is controlled by the ‘S’ type Webb Thomson miniature electric staff apparatus fitted with pilot locks. Semaphore signals are provided or are in process of being erected at most stations. They consist of one outer and two home signals at each end of the station.
These points and signals are not interlocked from the ground frame; this only operates the signals, and the points are worked by the ordinary throw-over lever and locked when set as required. Until the points are so locked, the signal applying to that particular road cannot be pulled off, and the outer signal cannot be pulled off until one of the home signals has been lowered. At the large stations it is intended to erect comprehensive signalling installations with points interlocked and detected.

**Locomotive and Rolling-Stock.**

On March 31, 1927, the total number of locomotives was 243, there being 230, including 45 shunting engines, for the 3-feet 6-in. gauge, and 13 for the 2-feet 6-in. gauge. A brief list of the different types of engines is given below:

<table>
<thead>
<tr>
<th>Engine Class</th>
<th>Wheel Arrangement</th>
<th>Axle Load on Driving Wheels</th>
<th>Coal capacity</th>
<th>Water capacity</th>
<th>Tractive Effort at 85 Per cent. Working Pressure</th>
<th>Weight of Engine and Tender in Working Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>For passenger trains.</td>
<td>{251 4-8-0 9 9 0 4 2,000 22,493 T. C. Q.}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>401 4-6-0 10 9 0 4 ½ 2,500 17,952 78 0 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>405 4-6-2 12 10 0 7 ½ 3,000 22,745 98 5 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>601 4-8-0 9 13 0 3 ½ 3,000 21,114 81 12 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed traffic engines.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freight traffic engines.</td>
<td>{301 4-8-0 11 9 0 7 3,000 29,013 91 2 0}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>701 4-8-2 12 13 2 7 ½ 3,000 38,557 125 17 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>801 2-8-2 16 10 2 7 ½ 3,000 38,557 125 17 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Except for shunting engines all are fitted with superheaters, and the newer types with the ‘Pyle’ electric light installation.

The most powerful type is a three-cylinder engine, the total weight of engine and tender in working order being 126 tons. At 85 per cent. of the boiler pressure the tractive effort is 38,557 lb. A feature of interest in connection with the 801 class engines is that they are believed to be the first 3-cylinder simple engines ever to be run on the 3-feet 6-in. gauge.

Five new express engines, four passenger, tank engines, and 12 shunting engines are being added to the above stock.

Running sheds exist roughly every 100 miles, which distance is considered a fair run for engine and crew under the conditions in a tropical country like Nigeria. In some districts the sheds are so spaced that a shuttle is run. The sheds are generally equipped with a hydraulic drop pit, 30-cwt. block and tackle, smiths’ hearths, treadle lathe, hand drilling machine, and hand shaping machine; as well as the usual shed equipment in the matter of tools, stores, &c.
At Zaria, a subsidiary workshop exists capable of dealing with all running repairs to the Bauchi Light Railway engines and mainline engines on the Northern Division. Each division has its own 25-ton breakdown crane and properly equipped tool vans.

Steam pumps are installed or are in the process of being installed throughout the line, the standard being the horizontal outside packed Worthington-Simpson pumps 10 in. by 6 in. by 12 in. The steam supply for driving these pumps is obtained from Spencer Hopwood No. 14 vertical type boilers.

Coal consumption averages 76 lb. per mile, and oil consumption 6-9 pints per 100 miles. Both these figures are considered good as the grades are heavy, the driving wheels of engines are of small diameter, and there are the usual conditions associated with a tropical country.

The coaching stock totals 282 vehicles and includes 15 first-class sleeping cars and nine restaurant cars. Vestibuled stock in all classes is provided for the express trains running in connection with the mail steamers. Electric lighting is in use on all trains, these installations and the fans being of the Vickers’ or Stone types. Additional first and third-class stock is on order to meet the demands of increasing passenger traffic. The coaching stock on the 2-feet 6-in. gauge totals 15 vehicles.

The goods stock totals 3,089 vehicles on the 3-feet 6-in. gauge and 117 on the 2-feet 6-in. gauge. Most of the wagon stock consists of bogie vehicles with 20-ton carrying capacity, there being 70 allsteel wagons of this type. Special wagons with 2,093 cub. feet capacity are provided for such traffic as hides and skins, and cotton, and high-capacity wagons for coal traffic are being introduced. All stock is fitted with A.B.C. couplers and the automatic vacuum / brake. The stock also includes 112 brake vans, 209 special wagons for stone traffic, and two wagons (constructed in the Colony) for exceptional loads such as mining machinery, &c.

Railway Workshops.

Two main workshops have been established, one at Ebute Metta, constructed by Sir W.G. Armstrong, Whitworth & Co. Ltd., and the other at Enugu, constructed by Sir William Arrol & Co. Ltd. The smaller workshops at Port Harcourt, Offa and Minna are being closed down, and only a small shop at Zaria is being retained to deal with the repairs to the 2-feet 6-in. gauge stock. The main shops at Ebute Metta have a total covered area of 216,500 sq. feet, and extensions are in progress which will increase this area by 52,650 sq. feet. The covered area at Enugu is 93,350 sq. feet in extent, and the shops there are equipped in a similar manner to those at Ebute Metta, but on a smaller scale. The power station at Enugu is controlled by the railway, and power both for workshops and colliery is provided. At both shops, carriage and wagon repairs are handled, as well as locomotive repairs. The Ebute Metta shops were designed to deal with 80 engine
overhauls and 700 carriage and wagon repairs per annum, while the Enugu shops were designed to attain half this output. The Ebute Metta workshops comprise two groups. Electric power is supplied from the Public Works power station at Iddo, approximately three miles away. Current is delivered at 3,300 A.C. and converted to 440 D.C. for machine-power purposes and 220 A.C. for lighting. The sub-station where conversion takes place is equipped with 3/500 kW rotary converters and 3/550 kVA transformers supplied by Metropolitan-Vickers Electrical Co. Ltd.

A complete system of up-to-date roof-lighting is installed throughout the shops, all the fittings and equipment having been supplied by Metropolitan-Vickers Electrical Co. Ltd.

The Ebute Metta locomotive shops consist of five bays 500 feet long, four bays being 45 feet wide, and the fifth or erecting shop 55 feet wide. The iron and brass foundries, copper shop, and the smithy are situated in No. 1 bay. Two 30-cwt. cupolas are used to produce cast iron, and the usual pot furnaces are used for the brass foundry. Three ‘Mumford’ moulding machines are used for repetition iron and brass work, metal patterns for which are mounted on plates, for use in the machines. One 5-ton overhead crane is provided in the foundry. In the smithy a spring furnace hydraulic spring buckling and testing machine, a bolt and nut making machine, one 20-cwt. steam hammer, one 20-cwt. Massey electric-pneumatic hammer, and one 5-cwt. hammer of the latter type. Oil-fired furnaces are used for case-hardening and tool-making purposes. There are 12 smiths’ hearths, the vertical flues of which preclude the possibility of overhead cranes, and a number of 2-ton jib cranes are provided for lifting purposes.

No. 2 bay is devoted to the machine shop and includes the brass machine and finishing shop and the tool room. At the south end of the bay are situated two planing machines, one 12 feet by 6 feet by 6 feet, by Craven Bros., and the other 8 feet by 3 feet by 3 feet, by Stirk’s. The machines are arranged in groups, each group driven by an electric motor. There are two lathe groups, consisting of six 8 1/2-in., 10-in. and 12 1/2-in. sliding, surfacing and screw-cutting lathes by Dean, Smith and Grace, Lang’s and other makers, and three ‘Herbert’ hexagon turret lathes. Opposite these lathe groups is a battery of five Craven’s radial drilling machines. Situated next is the milling and shaping machine group.

The grinding shop consists of two piston rod grinders, a slide bar grinder, a double-spindle lapping machine, a motion pin grinder, and a universal grinding machine by Beyer Peacock, with a radial attachment for grinding reversing links. The brass shop is equipped with two 8 1/2 in. brass lathes, one 6-in. lathe, two 10-in. shaping machines, one brass milling machine, a brass boring machine by Craven Bros., and the usual polishing buffs. The tool room consists of a No. 3 Lumsden oscillating tool grinder, and the usual grinding machines for dealing with milling cutters, twist drills and cutting tools generally, and a
6 ¼-in. Lang tool-room lathe completes the equipment. One 5-ton overhead electric crane serves No. 2 bay.

No. 3 bay contains, at the south end, the wheel shop, with three motor-driven wheel lathes and an axle journal lathe by Craven Bros., a wheel quartering machine, and an internal wheel drill. An Alldays & Onions oil-fired tyre heater is situated in this shop served by a 2-ton jib crane. Next to the wheel shop is situated the boiler shop machinery, consisting of two punching and shearing machines, together with an angle-iron bending machine and a battery of two radial drilling machines by Craven Bros., and one vertical drill.

There is also a hydraulic tube-testing machine, a tube-stretching machine, and a motor-driven cold saw. There are two plate rolls, one 6 feet and the other 8 feet, the latter capable of rolling plates up to 5/8 in. thick. A quasi-arc electric welding plant is adjacent to the boiler machine shop, and a Alley and MacLellan air compressor, driven by a 100-H.P. motor, supplies compressed air to the boiler, tender and erecting shops. The north end of No. 3 bay provides accommodation for 14 tenders. This bay is provided with two 5-ton overhead electric cranes.

In No. 4 bay, at the south end, is situated the motion, valves, axle-box and brake gear bays, which are adjacent to the erecting shop. In the northern half of this bay is accommodation for 11 boilers for repairs, and at the extreme end is a 10-feet by 8-feet plate furnace, with four smiths hearths and an annular hearth, with the necessary levelling blocks. Cranage facilities in the four bays consists of two 20-ton overhead electric cranes.

No. 5 bay is the erecting shop, and has accommodation for 20 locomotives. Two 40-ton overhead electric cranes serve this shop, and there is an Avery weighing and balancing machine at the south end. All the overhead cranes in the shops were supplied by Craven Bros.

The carriage and wagon repair shops are situated some 500 yards to the north of the locomotive shops and consist of four bays, each 450 feet long by 55 feet wide. They include a paint shop, carriage repair shop, wagon repair shop and a woodworking machinery and joiner’s shop. The saw mill is situated in line with the wood-working machinery shop, 360 feet north of it, and contains a Robinson log band saw, a Ransome’s log band saw and a log rack saw. The saw-sharpening machines are installed in the saw mill, which is 200 feet by 55 feet. The carriage and wagon shop bays will accommodate 45 vehicles of the standard 40-feet bogie goods type. There are two 15-ton electric overhead cranes in each of the two bays devoted to carriage and wagon repairs and one 15-ton crane in the saw mill.

At the Ebute Metta shops, 27 engines received heavy repairs during the year 1926–27 and 24 engines second-class repairs. Fourteen new engines from England were erected. In the carriage and wagon shops, the out-turn for 1926–27 was: rebuilds 174, general repairs 506, light repairs 26, and new vehicles erected 30.
Considerable additions to the machine shop and boiler shop, in the shape of up-to-date machine tools, have been authorised, together with an hydraulic equipment of flanging presses and riveters. An extension of the woodworking bay, to join up with the saw mill, is proposed, amounting to some 360 feet of extra shop space.

Enugu Workshops.

The Enugu locomotive shops consist of three bays, each 300 feet long, two of which are 45 feet wide and one 55 feet wide, the latter being the erecting shop.

The smithy is situated in the south end of No. 1 bay, and is provided with one 20-cwt. Massey electric pneumatic hammer, a bolt and rivet-making machine, a hydraulic spring buckling machine, seven double smiths' hearths, and the usual case-hardening and tempering furnaces, all of which are oil-fired. The copper-smith's shop is next to the smithy, and the foundry is placed in the north end of No. 1 bay, and has one 30-cwt. iron melting cupola, pot brass furnaces, and a sand mill.

The machine and fitting shop are situated in No. 2 bay, and consist of two wheel lathes by Craven Bros., an axle journal lathe, a wheel press of 200 tons capacity, and a 60-in. tyre boring mill. There is a lathe group consisting of three centre lathes, two hexagon turret lathes, and two bolt and nut-screwing machines. There are also a 9-feet planing machine, a 12-in. slottor, and a 7-feet 8-in. radial drill, / all motor driven. In addition there are two small group drives, with a 6-in. and a 9-in. shaper, a universal milling machine, hack saw, and a cold saw; a grinding group with a piston rod grinder, hole and ink grinding machine, and a motion pin grinder. A small brass finishing shop and tool room is located in this bay, and a 5-ton overhead electric crane is provided.

No. 3 bay contains the boiler and erecting shops. There is accommodation for five engines and five boilers under repair at once in the boiler shop. There is a 7-feet 8-in. radial drill by Craven Bros., a 6-feet 1/2-in. plat roll, a smith's hearth, and a 5-feet annular hearth, with the necessary fan and motor. There is also a motordriven punch and shearing machine. In the erecting shop there is an Alley and MacLellan air compressor, and a locomotive weighing and balancing machine. Two 40-ton electric overhead cranes are provided.

The carriage and wagon shop is situated to the north of the locomotive shop, separated from it by an electrically-driven traverser. This shop consists of three bays, each 200 feet long by 45 feet wide. No. 1 bay contains the woodworking machinery, which consists of a 36-in. circular saw mortising and boring machine, 36-in. vertical band saw, a general joiner, a 48-in. rack saw, a tenoning machine, a panel planer and thicknesser, a double-spindle moulding machine, and the usual saw-sharpening machinery. There is a 5-ton overhead electric crane in this bay. No. 2 bay is the carriage and wagon repair shop, and will accommodate ten vehi-
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There is a 15-ton electric overhead crane in this bay. No. 3 bay is the paint shop and wagon finishing shop.

There is no saw mill at Enugu, the timber being sent by rail from Port Harcourt, where the saw mill is situated, which consists of a Ransome’s log band saw, driven by a horizontal steam engine and locomotive type boiler.

The output from Enugu locomotive shops during 1926–27 was 11 heavy repairs and 10 second-class repairs, and the carriage and wagon shop turned out 374 rebuilt open low-side wagons, 157 general repairs and 119 light repairs. To cope with the growing traffic, extensions of the machine shop and erecting shop have been authorised to the extent of 125 feet to each bay. It is also proposed to remove the saw mill from Port Harcourt to Enugu, and to change over the mill from steam to electric drive.

Passenger and Goods Traffic.

The principal stations on the Nigerian Railway are at the ports of Lagos and Port Harcourt, where extensive transit sheds and coaling facilities have been provided. Another important station is Apapa (part of the port of Lagos), where four large sheds are provided. At this place all the import and export traffic between the coast and the country stations is handled. Four large steamers can berth at the same time for the purpose of loading and discharging cargo.

Ibadan, 120 miles from Lagos, has a population of 238,094, and exports cocoa, cotton and palm kernels. Minna is the junction for the branch line to Baro, and Kaduna is the junction for the loop line to Jos, Bukuru (tin fields), and the main line to Port Harcourt. It is the capital of the Northern Provinces of Nigeria.

Zaria is an important Emirate in Northern Nigeria. Here there is a ginnery owned and worked by the British Cotton Growing Association, the plant of which is capable of turning out 18,000 bales of pressed and ginned cotton per annum for shipment to the United Kingdom. Other similar ginneries exist on the light railway from Zaria and at various points near Zaria, from which the traffic is brought by railway lorries.

Kano is the present terminus of the railway, and another important Emirate of Northern Nigeria, with a population of 49,938. It is also a centre of the Caravan trade, and the largest ground-nut market in Nigeria, over 100,000 tons being bought for shipment to the United Kingdom last season. Jos is the centre of the tin-mining industry of Nigeria, turning out some 11,000 tons of tin annually for shipment, and also importing large quantities of mining machinery and material. Enugu is the centre of the coal-mining industry, which is under the administration of the railway. There is an outturn of 360,000 tons of coal per annum.
A tri-weekly service of mixed trains is maintained between Lagos and Kano (705 miles), with through carriages to Jos via Kaduna Junction. These trains include first and second-class sleeping cars, restaurant car and third-class vehicles. A well-equipped express train is also run in the same service in connection with the English mail boats. This train is composed of 2 baggage vans, 5 first-class sleeping saloons, 1 restaurant car, 1 store van, 1 third-class vehicle (for servants of first-class passengers only) and 1 brake van. Each sleeping car is 60 feet long, contains six compartments, and is fitted with two lavatories, line cupboards, &c., each compartment being fitted with electric light, a fan and bells. The train is vestibuled throughout, and the restaurant car seats 24 passengers.

The boat express service is as shown below:

<table>
<thead>
<tr>
<th>Up</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lagos –</td>
<td></td>
</tr>
<tr>
<td>Iddo</td>
<td>–</td>
</tr>
<tr>
<td>Ibadan</td>
<td>arr. 2.57</td>
</tr>
<tr>
<td>Ibadan</td>
<td>–</td>
</tr>
<tr>
<td>Horin</td>
<td>arr. 9.50</td>
</tr>
<tr>
<td>Jebba</td>
<td>arr. 12.47</td>
</tr>
<tr>
<td>Minna</td>
<td>arr. 22.24</td>
</tr>
<tr>
<td>Kaduna</td>
<td>arr. 5.22</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Loop Line –</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kafanchan</td>
<td>arr. 13.42</td>
</tr>
<tr>
<td>Jos</td>
<td>arr. 19.10</td>
</tr>
<tr>
<td>Zaria</td>
<td>arr. 9.38</td>
</tr>
<tr>
<td>Kano</td>
<td>arr. 15.35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Down.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kano</td>
<td>dep. 3.08</td>
</tr>
<tr>
<td>Zaria</td>
<td>arr. 18.27</td>
</tr>
<tr>
<td>Jos</td>
<td>arr. –</td>
</tr>
<tr>
<td>Kafanchan</td>
<td>arr. 14.56</td>
</tr>
<tr>
<td>Kaduna</td>
<td>arr. 21.40</td>
</tr>
<tr>
<td>Minna</td>
<td>arr. 21.40</td>
</tr>
<tr>
<td>Jebba</td>
<td>arr. 5.01</td>
</tr>
<tr>
<td>Ilorin</td>
<td>arr. 14.13</td>
</tr>
<tr>
<td>Ibadan</td>
<td>arr. 17.25</td>
</tr>
<tr>
<td>Lagos (Apapa)</td>
<td>arr. 5.36</td>
</tr>
</tbody>
</table>

The catering on all trains is carried out by a contractor, under control of the railway, the prices for meals being: for breakfast, 3s. 6d.; luncheon, 4s. 6d.; tea 1s. 6d.; and dinner, 5s. 6d. Each restaurant car has cold-storage space, the ice being replenished on the journey from railway ice plants.

The operation of freight trains on the Nigerian Railway presents several difficult features, apart from the peculiar problems of working a heavy traffic over a single line. Firstly, there is the difference in the weight of rail between sections, which alters the maximum axle load. On some sections of the main line the permissible axle load is as low as 10 tons, 16 ½ tons. This involves consider-
able splitting up to trains. A second difficulties is the severity of the gradients on various sections of the main line.

The following loads (units of one loaded 10-ton wagon) are hauled over the various sections:

- Iddo-Ibadan: Up 54 units, Down 66 units.
- Ibadan-Jebba: Up 44 units, Down 44 units.
- Ibadan-Jebba: Up 28 units, Down 28 units.
- Minna-Zaria: Up 20 units, Down 20 units.
- Zaria-Kano: Up 28 units, Down 26 units.
- Port Harcourt-Mada: Up 50 units, Down 50 units.
- Mada-Kafanchan: Up 44 units, Down 54 units.
- Kafanchan-Kaduna Junction: Up 44 units, Down 54 units.
- Kafanchan-Jos: Up 50 units, Down 50 units.

The capacity of a train on the Minna-Kaduna section is thus less than one-third of the capacity of a train on the Lagos-Ibadan section, due to the lighter rail on the former line.

Communication between the office of the Superintendent of the Line and the Divisional Superintendents’ offices is maintained by direct telegraph lines. There are subsidiary direct circuits between the principal points on each division, while local station-to-station circuits are also installed, and there is also telephone communication between each station.

Comprehensive yard reports are received from each station every morning, and from these the goods trains are ordered daily for the following day by the train-ordering officers on each division. As a result of the seasonal nature of the traffic, the work done on particular sections varies considerably at different times of the year, and thus involves very careful distribution of wagons and power. The average haul is 303 miles.

Two important freight trains may be mentioned: one is a cattle train, Kano to Lagos; and the other a kola train, Lagos to Kano – both these trains, which run once a week, travelling to passenger train timings.

Traffic to and from Apapa, Ijora coal wharf, and the main goods depot in Lagos (Iddo) is concentrated in a marshalling yard at Ebute Metta Junction, to and from which point trip working is employed to make up up trains and distribute down trains.

The maximum number of trains run per week in the last busy season was 796, the density of traffic on various sections being as shown below:

<table>
<thead>
<tr>
<th>Sections</th>
<th>Rails</th>
<th>Trains per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iddo-Ibadan</td>
<td>80lb.</td>
<td>77</td>
</tr>
<tr>
<td>Ibadan-Jebba South</td>
<td>55 lb.</td>
<td>64</td>
</tr>
<tr>
<td>Jebba South-Minna</td>
<td>45 lb.</td>
<td>114</td>
</tr>
<tr>
<td>Minna-Zaria</td>
<td>45</td>
<td>153</td>
</tr>
<tr>
<td>Zaria-Kano</td>
<td>45 lb.</td>
<td>53</td>
</tr>
<tr>
<td>Minna-Baro</td>
<td>45 lb.</td>
<td>7</td>
</tr>
</tbody>
</table>
Motor transport services acting as feeders to the railway are maintained along roads radiating from Zaria (Northern Division) up to Sokoto, a distance of 250 miles from Zaria. For the last financial year the motor transport section earned £24,145 and ran 257,000 vehicle-miles. The motor fleet consists of Albion lorries and trailers, with three Reo light lorries and inspection vehicles. Three experimental half-track road vehicles (two made by Messrs. Guy and one of the Burford-Kegresse type) are also being run.

The principal exports during the year 1926-27 were: coal, 150,000 tons; ground nuts, 111,895 tons; and palm kernels, 70,326 tons; while the main imports were: salt, 28,491 tons; mineral oils, 11,689 tons; and kolas, 10,271 tons, Ground nuts alone brought in freight revenue to the extent of £470,786.

### Rates and Fares.

Passenger fares are 4d. per mile first class, 1 ¼d. per mile second class, and ½d. per mile third class, 2 cwt. accompanied luggage being carried free for first-class passengers, 1 cwt. for second and 28 lb. for third-class. Goods rates are based on a classification with nine classes. There are very few exceptional rates. As an example of the rates charged, that for ground nuts may be quoted. This is a traffic in Class 3 with an average haul of over 600 miles, and amounting to over 100,000 tons per annum. The rate from Kano to Lagos (705 miles), including terminals, is 89s. 9d., or 1.527d. per ton-mile.

### Consigning and Waybilling of Goods.

The system of consigning and waybilling goods is the same as that generally in use on Colonial railways. The consignor hands in at the despatching station a consignment note on the prescribed form. After the goods have been weighed and payment made, a waybill is prepared in quadruplicate, one copy being handed back to the consignor as his receipt for the goods. This must be handed in by the consignee at the receiving station before he can take delivery, and if it is lost or disfigured, an indemnity note has to be signed. Of the other three copies one is retained by the despatching station and filed along with the consignment note; another is sent to the Traffic Audit branch of the Accounts Department; and the final copy is handed to the guard of the train, who hands it over at the receiving station. The clerk there checks the copy brought by the guard with the copy handed in by the consignee, and then forwards the former to the Traffic

<table>
<thead>
<tr>
<th>Sections</th>
<th>Rails</th>
<th>Trains per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port Harcourt-Enugu</td>
<td>60 lb.</td>
<td>104</td>
</tr>
<tr>
<td>Enugu-Makurdi South</td>
<td>60 lb.</td>
<td>10</td>
</tr>
<tr>
<td>Makurdi North-Kafanchan</td>
<td>60 lb.</td>
<td>22</td>
</tr>
<tr>
<td>Kaduna Junction-Jos</td>
<td>60 lb.</td>
<td>36</td>
</tr>
</tbody>
</table>
Audit branch and retaining the latter. The station accounts are framed on the principle of a daily balance, a system well suited to the capabilities of the staff. Errors are brought to light promptly, so that the station staff have a better chance of recovering from consignors. There are no outstandings, and station accounts are kept well up to date; transfers of staff can be effected at a moment's notice with a minimum of accounting work at the handing over. It is, of course, only applicable where there is no 'to pay' traffic.

Staff, Safety, &c.

Broadly speaking, all supervision is carried out by Europeans, but endeavours are being made by means of training schools and other schemes for teaching the African to enable him as time goes on to take a larger part in the more responsible work of the railway. Most of the main-line locomotive drivers are European, but by degrees it is hoped to be able to replace them by Africans. All the shunting engines are manned by native drivers.

The following statistics show what a high measure of freedom from accidents the Nigerian Railway enjoys:–

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Passengers carried</th>
<th>Fatal</th>
<th>Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1922–23</td>
<td>1,608,713</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>1923–24</td>
<td>1,859,961</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1924–25</td>
<td>1,922,580</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>1925–26</td>
<td>2,413,113</td>
<td>–</td>
<td>11</td>
</tr>
<tr>
<td>1926–27</td>
<td>2,621,432</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

The accidents were caused chiefly through passengers attempting to join train in motion.

The railway maintains ice and mineral water plants at many of the principal stations on the system.

Most of the large marshalling yards are, or in the course of the near future will be, illuminated by electricity, the generation of which in some cases is controlled by the Railway Administration.

[...]

THE GOLD COAST RAILWAY.

The First Section of this Line was not Opened until 1901, but the system now comprises nearly 500 miles of 3-feet 6-in. Gauge Track. Manganese Ore and Cocoa are the heaviest items of Freight Traffic.

The Gold Coast Railway forms a rough inverted ‘V’, with its base point at Kumasi, the Ashanti capital, and its extremities at Sekondi and Accra, on the Gulf of Guinea. The area of the Colony Ashanti and Protectorate is about 80,000 miles, the population being a little over 2,000,000 (1921 census). The
line now extends for nearly 500 route-miles, and it is significant of the rapidity of development in this territory that the first section of railway was not opened for service until 1901. Projects for railways in the Colony had, of course, been mooted long before that date, but it was not until 1892 that the question was seriously considered, and the end of 1896 before a survey was ordered. Then Mr. W. Shelford (afterwards Sir William Shelford, K.C.M.G.) was instructed to report upon the country lying between Sekondi and Tarkwa, where for some years gold-mining activities had been in progress, and upon the needs of which the decision to build the railway was based.

From the outset the choice of the coast terminus was the subject of considerable discussion. Both Takoradi and Sekondi were considered, but while it was recognised that the former was a superior location for a deep-water harbour, it was then thought that the traffic would be too light to justify the expenditure involved, so a lighterage harbour at Sekondi was decided upon. It is worthy of note in this connection that Takoradi is now being developed as a deep-water port, the tremendous growth of traffic having rendered such a convenience absolutely essential.

Railway construction on the first section of line commenced in 1898, but progress at first was slow, mainly owing to the shortage of labour. In due course, however, labourers were recruited from Nigeria, and then the last Ashanti war broke out and completely stopped work on the railway until the end of 1900. Railhead eventually reached Tarkwa, 40 miles from Sekondi, in May, 1901. The next section (completed in December, 1902) was from Tarkwa to Obuasi, 85 miles, and the line was then pushed rapidly forward to Kumasi, 168 miles from the coast, the first train reaching the capital city of Ashanti on October 1, 1903.

The next railway to be built, apart from short extensions, was one starting from Accra, the capital of the Colony, and destined ultimately to join the other line at Kumasi. The first section was opened to traffic in 1912, but thereafter progress was slow, and there was for a long time a gap between Tafo and Kumasi. In 1923, however, this gap was spanned, and the through Sekondi-Kumasi-Accra line, 362 miles long, became an accomplished fact. In the same year the construction of the Central Province Railway, from Huni Valley (54 miles from Sekondi) to Kade, 99 miles, was commenced. This has now been completed.

Results of the Working.

Although, as mentioned previously, it was originally considered that traffic volume would be light, this has not proved to be the case, and there has, ever since 1903, been a considerable percentage excess of receipts over working expenses. A table for the past ten years is given below:
Anon., *The Railways of Africa*

<table>
<thead>
<tr>
<th>Year</th>
<th>Miles Open (Mean mileage)</th>
<th>Gross Earnings</th>
<th>Working Expenses</th>
<th>Net Earnings</th>
<th>Proportion of Working Expenses to Gross Receipts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1917</td>
<td>268</td>
<td>£494,185</td>
<td>£195,479</td>
<td>£298,706</td>
<td>39.56</td>
</tr>
<tr>
<td>1918</td>
<td>269</td>
<td>£456,574</td>
<td>£197,518</td>
<td>£259,056</td>
<td>43.36</td>
</tr>
<tr>
<td>1919</td>
<td>269</td>
<td>£672,311</td>
<td>£234,230</td>
<td>£438,081</td>
<td>34.84</td>
</tr>
<tr>
<td>1920</td>
<td>269</td>
<td>£737,262</td>
<td>£365,309</td>
<td>£371,953</td>
<td>49.55</td>
</tr>
<tr>
<td>1921</td>
<td>276</td>
<td>£706,107</td>
<td>£455,249</td>
<td>£250,858</td>
<td>64.47</td>
</tr>
<tr>
<td>1922–23</td>
<td>334</td>
<td>£877,893</td>
<td>£398,340</td>
<td>£479,553</td>
<td>45.37</td>
</tr>
<tr>
<td>1923–24</td>
<td>379</td>
<td>£1,012,081</td>
<td>£528,530</td>
<td>£483,551</td>
<td>52.22</td>
</tr>
<tr>
<td>1924–25</td>
<td>394</td>
<td>£1,066,560</td>
<td>£551,733</td>
<td>£514,827</td>
<td>51.73</td>
</tr>
<tr>
<td>1925–26</td>
<td>394</td>
<td>£1,102,301</td>
<td>£568,012</td>
<td>£534,289</td>
<td>51.53</td>
</tr>
<tr>
<td>1926–27</td>
<td>457</td>
<td>£1,156,453</td>
<td>£572,882</td>
<td>£583,571</td>
<td>49.54</td>
</tr>
</tbody>
</table>


Working Results of the Gold Coast Railway. /

The total goods and mineral traffic carried on the railways was 47,388 tons in 1906, 298,593 tons ten years later, and 805,227 tons in 1926–27. Passenger traffic shows a similar extraordinary advance. The number of passengers carried in 1906 was 89,282, 88,442 ten years later, and nearly 1,500,000 during the last financial year. In the year 1926–27 total earning were £583,571. This discloses an operating ratio of 49.54 per cent., which is slightly less than that for the three previous years. It may be added that, of the total earnings, coaching traffic brought in £224,031, goods £894,220, and sundries £38,202.

Control and Organization.

Like all similar railways the Administration of the Gold Coast Railway reports, through the Governor, to the Secretary of State for the Colonies. Its affairs are, therefore, dealt with directly by the Assistant Secretary responsible for the political affairs of West Africa, who, through the medium of his Chief and the Governor of the Colony, acts as the Chairman of the Board of Directors might do in the case of a privately-owned railway. The actual management of the railway system is vested in a General Manager (Mr. R. H. Dawson), who is assisted by the usual departmental officers. Of course, in a country such as the Gold Coast, the number of officers with administrative rank is necessarily large, owing to the need for a goodly proportion being on leave at all times. The ordinary departmental scheme is generally followed in the organization [...].

The headquarters of the railway administration are at Sekondi, where the General Manager and the heads of the various departments are stationed.
Administration is divided into two districts, with headquarters at Sekondi and Accra respectively. The first covers the main line from Sekondi to Akwaseho and the Central Province, Prestea and Inchaban branches, and the second, the main line from Accra to Akwaseho and the Weshiang (2 feet 6 in.) light railway.

The staff employed at the end of 1826–27 was as follows:

<table>
<thead>
<tr>
<th>Staff Type</th>
<th>Africans</th>
<th>Europeans</th>
<th>Clerks and Station Staff, &amp;c.</th>
<th>Artisans and Crane Drivers and Engine Crews.</th>
<th>African Plate-layers and Headmen.</th>
<th>Labourers, &amp;c.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Branch</td>
<td>38</td>
<td>24</td>
<td>168</td>
<td>192</td>
<td>1,564</td>
<td></td>
</tr>
<tr>
<td>Locomotive</td>
<td>86</td>
<td>50</td>
<td>701</td>
<td>–</td>
<td>–</td>
<td>625</td>
</tr>
<tr>
<td>Traffic</td>
<td>19</td>
<td>400</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>582</td>
</tr>
<tr>
<td>Stores</td>
<td>7</td>
<td>23</td>
<td>6</td>
<td>11</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>Accounts and Printing Branch</td>
<td>14</td>
<td>98</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>8</td>
</tr>
<tr>
<td>Management Branch</td>
<td>4</td>
<td>13</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>168</td>
<td>608</td>
<td>203</td>
<td>2,828</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Permanent Way and Works.

The Gold Coast Railway system now extends to nearly 500 miles of track, there being 493 miles of main lines and branches as follows:

<table>
<thead>
<tr>
<th>Miles</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sekondi-Accra Lines</td>
<td>362</td>
</tr>
<tr>
<td>Prestea Branch</td>
<td>18</td>
</tr>
<tr>
<td>Inchaban Branch</td>
<td>4</td>
</tr>
<tr>
<td>Weshiang Branch</td>
<td>10</td>
</tr>
<tr>
<td>Central Province Branch</td>
<td>99*</td>
</tr>
<tr>
<td>Total open lines mileage</td>
<td>493</td>
</tr>
</tbody>
</table>

The first lines, being of a pioneer type, were built with light material and originally laid with maximum grades of 2.5 per cent. / and curves of 330-ft. radius, the ruling gradient on the main lines at the end of 1920 being 2 per cent. and the sharpest curve 33-ft. radius. These have necessarily had to be strengthened from time to time to meet increasing traffic requirements.

Many different classes of material were in use. Even now parts of the main line are laid with 45- and 50-lb. per yard rails, but on the extension from Tafo to Kumasi, and on the Central Province line, 60-lb. rail was used; and between Sekondi and Obusi the 50-lb. rails have been replaced by 80-lb. rails. 45- and 50-lb. rails will, however, be in use for some time on parts of the main line and branches, but as the need arises for relaying they will be replaced by 80-lb. or 60-lb. rails as the traffic warrants. Flat-bottomed rails with steel sleepers are used throughout, except at switches and on bridges, where timber sleepers are used.

* Total to Kade.
It has been found, especially on curves, that smoother riding and less wear is obtained by staggered joints, and whenever the need for relaying arises the joints are being altered from square to staggered. The number of sleepers laid varies from 13 to 14 to the 33-ft. rail. Broken stone or gravel is used as ballast wherever possible, and any inferior ballast is gradually being replaced by the above. The standard now adopted for grades is 1.25 per cent. against imports and 1 per cent. against exports, and curves with a minimum radius of 66 ft. All bridges on the main line, Sekondi-Kumasi and Tafo-Kumasi, are now capable of taking 16-ton axle loads.

Owing to the character of the labour the number of men per mile employed on permanent-way maintenance work is greater than would normally be the case, but it is expected that by improved education it will be possible in due course to bring this down to a more suitable figure. It is anticipated that an average on the heavier lines of two men per mile will be sufficient, and that the average length of line supervised by foremen plateayers will be approximately 40 miles.

A great deal of work has been done during the last few years between Sekondi and Kumasi in eliminating curves and reducing grades, thus enabling much heavier and longer trains to be run, the minimum curvature on that section now being 660-ft. radius, and the grades 1 in 80 against imports and 1 in 100 against exports. All the bridges have been replaced by new bridges or strengthened to take a 16-ton axle load. Sidings at stations were also lengthened to take the longer trains. Considerable improvements have also been made in the track conditions to prevent wash-outs and the flooding of the line.

On the Central Province Branch, from Huni Valley to Kade, approximately 99 miles, considerable bridge work has been necessary, one bridge spanning the Pra River at 29 ¼ miles being 480 ft. long from abutment to abutment, with 5 piers. This was built under contract by Sir William Arrol & Co. Ltd. Another bridge, crossing the Birrim River at 83 1/2 miles, is 272 ft. long from abutment to abutment, with two piers, and was built departmentally. This bridge also carries a public road.

So far as extensions are concerned, an instrumental reconnaissance survey to determine the feasibility or otherwise of extending the railway some 350 miles northwards from Kumasi has been carried out, and two routes are under examination.

Locomotive, Carriage and Wagon Shops.

The principal locomotive, carriage and wagon workshops, and the stores are situated at Location, about two miles out of Sekondi, and were opened in 1917, while there is a smaller shop at Accra. The locomotive workshops at Location, which are well appointed and up to date, consist of six bays, 300 ft. long by 65 ft. wide, five of which are ranged side by side. The paint shop is housed in the
sixth bay and the coppersmith’s shop and patternmaker’s shop and store are also contained in separate buildings. All plant is electrically driven, the power house being situated nearby. The plant includes the following equipment:

**Bay No. 1, Boiler Shop.**

Hydraulic accumulator and pumps, 100-ton flanging press, 100-ton horizontal press, 100-ton hydraulic flanger, 80-ton plate-curving machine, 80-ton fixed riveter, &c. (Fielding & Platt Limited); plate rolls (Craven Bros. (Manchester) Ltd. and Pollock & Macnab Limited); plate edge planing machine (Smith Bros. & Co. (Glasgow) Ltd.); 7-ft. portable radial drill (Wm. Asquith Limited); radial drill (Smith & Coventry Limited\(^{[21]}\)); punch and shearing machine (James Bennie & Sons Ltd.); angle-iron bending machine (Rushworth & Co.); cold saw (Clifton & Waddell); oil-fired furnace (New Alldays & Onions Limited); two 15-ton overhead electric cranes (Vaughan Crane Co. Ltd.).

**Bay No. 2, Tank Shop and Millwright Section.**

Sentinel air compressor (Alley & Maclellan Limited\(^{[22]}\)); tube-cutting machines, shaping machine (Atlas Engineering Company); acetylene and electric welding plants (Allen-Liversidge Limited); one 15-ton overhead electric crane (Vaughan Crane Co. Ltd.).

**Bay No. 3, Machine Shop and Tool Room.**

Six, 6¼, 8, 10, 24-in. screw-cutting and sliding surfacing lathes, 2-in. hollow spindle lathes (J. Lang & Sons); 7-in. hollow spindle, 7½-in. screw-cutting and sliding lathes, centring machine, double-headed drilling and boring machine (Loudon Bros. Ltd.); capstan lathe, radial drilling machine, planing machine, 5-ft. 2-in. diam. face-plate double-wheel lathe, slide bar, grinding machine, 300-ton hydraulic wheel press (Craven Bros. (Manchester) Ltd.); 14½-in. axle-turning gap bed lathe (Dean, Smith & Grace); 24 and 27-in. screw-cutting and sliding surfacing gap-bed lathes (Henry Holmes & Co. and Sir W. G. Armstrong, Whitworth & Co. Ltd.); capstan lathe, sensitive drilling machine, milling machine centring machine (Alfred Herbert Limited\(^{[23]}\)); 3-ft. 11-in. diam. face-plate double-wheel lathe, radial drilling machine (Hetherington & Sons Ltd.). axle journal turning lathe (Ward, Haggas & Smith); 48-in. boring mill (J. Butler & Co.); capstan lathe (Roberts Brothers); slotting machine, 18-in. double-headed shaping machine, hacksaw machine (Pollock & Macnab (1919) Limited); link-motion grinder (Beyer, Peacock & Co., Ltd.); planing machine, profiling machine, 18-in. slotting machine, cutter grinder (Wm. Muir & Co. Ltd.); grinding machine, 10 in. by 8 ft., ‘Norton’ 1 1/4 in. by 12-in. automatic keyway cutting and slot-drilling machine (The Atlas Engineering Company);
planing machine, duplex slot-drilling machine, horizontal boring mill, 72-in. boring (Geo. Richards & Co. Ltd.); radial drilling machine, external grinding machine, screwing machine, twist-drill grinder, universal grinder, sensitive drill-}
ning machine (Jones & Shipman Limited); 6-in. cold-saw machine and cold-saw sharpening machine (Clifton & Waddell); copper stay lathe (Hulse & Co. Ltd.); milling machine (Cincinnati Milling Machine Company); hydraulic arbor press 50 tons and hydraulic press 50 tons, Eames 24-in. duplex mill (Webster & Bennett Limited); tool grinder (Selson Engineering Co. Ltd. and Lumsden Machine Co. Ltd.); emery wheels and grinders (K. Johnson & Sons and Mitchell’s Emery Wheels Company); tool-hardening oil furnace (New Alldays & Onions Limited); one 5-ton overhead electric crane (Vaughan Crane Co. Ltd.).

Bay No. 4, Erecting and Fitting Shop.

Air compressor (Consolidated Pneumatic Tool Co. Ltd.); double emery wheel (K. Johnson & Sons); sensitive drilling machine (Jones & Shipman); portable valve-facing machines, cylinder boring machines, crank-turning machines (Beyer, Peacock & Co. Ltd.); two 3-ton overhead electric cranes (Vaughan Crane Co. Ltd.).

Bay No. 5, Foundry and Smith Shop.

Oil furnace for brass (the Consolidated Pneumatic Tool Company); 2-ton cupola for iron (Thwaites & Sons); sand grinder, sand riddle (James Evans & Co. (Manchester) Ltd.); moulding machine (Macnab & Co.); air hammers – 5, 10, and 20-cwt. (B. & S. Massey Limited); hot saw (Craven Bros. (Manchester) Ltd.); oil furnace, tyre furnace (Furnace Construction Co. (Sheffield) Ltd.); tyre furnace (New Alldays & Onions Limited); nut and bolt machine (Horsfalls); one 5-ton overhead electric crane (Vaughan Crane Co. Ltd.).

Coppersmith Shop.

Monometer machine (Monometer Manufacturing Co. Ltd.); hydraulic pipe-bending machines (Muscrove Brothers); pipe benders (Messrs. Hugh Kennedy).

Carriage and Wagon Shop.

A new carriage and wagon shop has recently been constructed at Location and was opened at the end of last year. The carriage and wagon shop measures 200 ft. by 180 ft., and is supplied in addition with a sawmill 300 ft. by 60 ft.

The shops include the following equipment:–

Hydraulic wheel press (Niles Bement-Pond & Co.); 5-cwt. pneumatic hammer (B. & S. Masseyes Limited); boring mill, 48-in. Velomill (John Stirk & Sons
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Lmt.); wheel lathe, 3-ft. 11-in. diam. face plates (Craven Bros. (Manchester Ltd.)); 12-in. lathe (John Lang & Sons); axle-journal turning lathe (Hetherington & Sons Ltd.); radial drilling machine and 12-in. lathe (Swift & Sons Ltd.); sensitive drill (E. H. Druce & Co. Ltd.); two 15-ton, two 10-ton, one 2-ton overhead electric cranes (Herbert Morris Limited).

Saw mill.

Log band saw, tendem saw, 4-sider planing machine, panel machine, vertical hollow chisel machine, slot mortising machine, circular rack saw, overhead planing machine, milling machine, log band saw grinder, plane iron grinder, band saw rolls tenoning machine (T. Robinson & Sons Ltd.); circular saws, band saw, gulleting machine, band saw sharpening machine (John MacDowall & Sons); wood lathe (J. Butler & Co.); general joiners (John Pickles & Son); 4-sider planing machine (Ransome & Co. Ltd.); one 5-ton overhead electric crane (Alfred Herbert Limited).

Locomotives and Rolling-Stock.

At the end of the 1926–27 financial year there were 85 locomotives on the books, the principal classes being as follows:

<table>
<thead>
<tr>
<th>Number of Locos</th>
<th>Class</th>
<th>Type</th>
<th>Weight in working order</th>
<th>Tractive effort at 85 per cent. boiler pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>151</td>
<td>4-8-0 tender</td>
<td>67 5 2</td>
<td>20,370</td>
</tr>
<tr>
<td>17</td>
<td>160</td>
<td>4-8-0 tender</td>
<td>71 1 1</td>
<td>22,840</td>
</tr>
<tr>
<td>5</td>
<td>181</td>
<td>4-6-0 tender</td>
<td>73 9 0</td>
<td>17,664</td>
</tr>
<tr>
<td>14</td>
<td>201</td>
<td>2-8-2 tender</td>
<td>103 0 0</td>
<td>30,480</td>
</tr>
<tr>
<td>4</td>
<td>221</td>
<td>4-8-2 tender</td>
<td>106 10 0</td>
<td>30,237</td>
</tr>
</tbody>
</table>

Coaching stock is represented by 106 units, there being 26 first- and second-class composite cars, 42 third-class cars, nine composite third-brakes, 12 mail, brake and baggage, 17 inspection, pay and specie cars, &c. The freight stock numbers 1,032, the principal types being 256 20-ton steel vans, 231 25-ton low-sided trucks, 103 16-ton wooden low-sided trucks, 52 17-ton steel low-sided trucks, and 153 20-ton wooden vans. On the 2-ft. 6-in. gauge Weshiang line, there were three locomotives, two passenger cars, one inspection car, and 22 freight vehicles. Running sheds are located at Sekondi, Tarkwa, Prestea, Obuasi, Kumasi, Nkawkaw and Accra.

Passenger and Freight Traffic.

As indicated previously, there has been an extraordinary development of traffic on the Gold Coast Railway. This is particularly noticeable on the freight side, but the growth of the passenger business is also worthy of record. Whereas in
1906, there were no more than 89,282 passengers transported by railway, ten years later this number had increased to 888,442 while during the financial year 1926–27, 1,953,917 passengers were carried, including workmen’s trains, which conveyed 501,000. The average fare paid that year was 33.43d., the average journey 29.95 miles, the average number of passengers per passenger train 125, and the average number per passenger vehicle, 22. First-, second- and third-class accommodation is provided, the last being naturally of the greatest volume. Indeed, third-class travel represents well over 95 per cent., with second-class about 3 per cent. and the first class 2 per cent.

Freight traffic has advanced from an insignificant 47,388 tons in 1906 to 805,227 tons in 1926-27, the special features contributing to this growth being the striking development of the cocoa and manganese ore traffics, and the steady progress in the tonnage of mahogany and wood fuel carried by the railway. The principal traffics carried during the year 1926–27 were manganese ore, 394,097 tons, cocoa 149,189 tons, and firewood 107,430 tons, and a growing traffic in general merchandise, native produce, &c.

Operating Statistics.

From an excellent series of statistics given in the Administration Report for the year 1926–27, it is noted that goods earnings represent 77.33 per cent. of total earnings, average freight paid per ton was 22.21s., average train-load was 105 tons, and the average wagon load was 14.61 tons. It may be added that the percentage of freight to capacity hauled was 44.18, while on the passenger side it was 40.22. The very large preponderance of traffic in one direction keeps the percentage of freight to capacity hauled on the low side.

For its length the Gold Coast Railway has not many stations. They average 1 for every 6 miles, and they adequately meet the requirements. Trains are worked on the absolute block system by means of the Webb Thomson apparatus, the miniature type being used on both lines. Last year, 85 per cent. of the main-line passenger trains reached destination on time, against 82 per cent. in the previous year, a very high rate when regard is paid to the fact that it is a single line. The densest portion of the line is between Sekondi and Huni-Valley which embraces the Central Province Branch, Prestea Branch, Inchaban Branch and the heavy manganese traffic from the Insuta Mines.

The speed at which goods trains are timed is, on the Sekondi line, 15 miles per hour, and on the Accra line, 18 miles per hour, passenger-train timings on the two lines being 25 and 20 miles per hour respectively. Goods trains are classified as fixed and conditional, the system of ordering trains being that the fixed daily trains run under ordinary conditions without notice and the conditional trains are ordered from the district offices.
The train ordering for each district is centralised in the district traffic office. Daily stock, &c., reports are wired in from all stations each day, and the district traffic officer is then enabled to arrange his trains and distribute their loads to the best advantage. A useful series of operating statistics is compiled regularly, but as these generally follow accepted practice, it is unnecessary to detail the figures. Special attention may, however, be directed to the fact that the operating ratio was as low as 49.54 per cent.

**Improved Traffic Facilities.**

As a result of the big programme of deviation work, for the purpose of securing a better alignment, and the use of heavier rails and locomotives, it is now possible for train loads of 440 tons to be handled on the Sekondi-Kumasi line against 210 tons prior to the improvements. This is of vital importance in view of the heavy demands of the manganese ore and cocoa traffics which are regularly increasing in volume. Insuta is the originating point of the manganese ore traffic, while most stations are of importance in connection with the cocoa traffic. The through goods trains between Obuasi and Sekondi, where the 80-lb. track enables engines of the 200 class to work, can take 20 vans of cocoa containing 20 tons each, the improved train loading thus effected having proved of great advantage in the handling of this important traffic.

In order to cope with the growing traffic and to make the best use of vehicles and engines a traffic control system (Western Electric train control apparatus) is being installed, and is at present operating between Sekondi and Tarkwa. It will eventually operate as far as Kumasi and is expected to be fully working in the next six months.

**Ports of Sekondi and Accra.**

The port of Sekondi, where ships lie in an open roadstead, is equipped with four jetties provided with steam and electric cranes, cargo being handled by lighters and surf boats. During the year ending March 31, 1927, 489,092 tons of exports were handled and 64,293 tons of imports, excluding about 25,000 tons of coal for railway use and other stores and material. The principal exports were manganese (394,000 tons), cocoa, and timber (mahogany logs). Twenty-two trains are scheduled during the 24 hours in and out of Sekondi.

The congestion at Sekondi will be relieved and quicker and better handling of imports and exports will be effected on the opening of Takoradi Harbour in 1928. This new deep-water harbour is four miles west of Sekondi. The harbour is formed by two breakwaters enclosing between them an area of sheltered water, with the inner face of the lee breakwater constructed as a wharf at which vessels up to a draught of 30 ft. can tie up.
The port of Accra deals with a large export traffic of cocoa and import of general goods almost entirely with surf boats. There is one jetty provided with cranes for handling imported motor-cars, mahogany logs exported, &c. Fifteen trains are scheduled in and out of Accra each day.

**Stores, &c.**

The majority of the material and stores required by the Gold Coast Railway is obtained through the Crown Agents for the Colonies, while a certain amount is obtained locally. Of the material received during 1926–27, totalling about £150,000, £64,000 represented the value of supplies received from the Crown Agents and £72,000 the value of materials purchased locally. In the Stores Department there are seven Europeans, 23 Africans and 60 store boys, &c., the working cost of the department being 5.16 per cent. of the issues.

**THE SIERRA LEONE RAILWAY.**

This 2-ft. 6-in. Gauge System extends for 338 route-miles and connects Freetown with Pendembu and Kamabai. More than Half the Freight Revenue is derived from the Transport of Palm Kernels.

The main line of the Sierra Leone Railway runs in an easterly direction from Freetown to Pendembu, a distance of 227 1/2 miles, the terminus being within a comparatively few miles of the frontiers of Liberia and French Guinea. The first survey was authorised by Lord Ripon, the then Secretary of State for the Colonies, in 1893, and in 1896 the construction of the first section of the line from Freetown to Songo, on the boundary of the Colony and Protectorate, a distance of 32 miles, was begun. The country was difficult from the constructional point of view, and numerous ravines necessitated the building of several steel viaducts in the first few miles. The section up to Songo was completed in December, 1897, and opened for traffic in May, 1899. In 1900 the line was extended to Rotifunk, 55 miles from Freetown, while in 1902 it reached Bo, 136 miles, and in 1905 was completed to Baiima, 220 miles from Freetown. Subsequently the line was extended to Pendembu.

In the meantime, between 1908 and 1916, a branch line, 104 miles long, was constructed from Bauya Junction (64 miles from Freetown) in, roughly, a north-easterly direction to Kamabai. It was originally intended to extend this branch in a northerly direction, but the project was abandoned during the war, and it is unlikely that it will be revived. Any further construction will probably be through the more productive traffic regions to the north-west or east.

In addition to these lines there is a short railway of 5 1/2 miles in length from Freetown to Hill station on the slopes of the mountains which rise steeply from the coast. This mountain railway was opened in 1904, its object being to enable
European Government officials to live in a more healthy locality. The main line rises to its maximum height of 647 ft. above sea level at mile 216, and the mountain railway terminates at a point 748 ft. above the sea, which is its highest point. The total route-mileage is 338 miles.

**Results of Working.**

The railway authorities advise us that there are good prospects of the current year’s total revenue exceeding that of 1925, which was £231,889, and so far is the record for the railway. The total net receipts in 1926, after deducting ordinary and extraordinary (but not capital) expenditure, were £53,135, the operating ratio being 76.75 per cent. Gross revenue was £228,527 and expenditure £175,392. The results for that year are, however, somewhat misleading, owing to a six weeks’ strike of railway employees in Sierra Leone and the general strike and prolonged coal stoppage in England which, of course, affected the Colony to some extent. Particulars of the results of working for the last 10 years are given in the following table:–

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue</th>
<th>Working expenses (including outlay on extraordinary works on revenue account)</th>
<th>Percentage of expenses to revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1917</td>
<td>158,495</td>
<td>135,588</td>
<td>85.54</td>
</tr>
<tr>
<td>1918</td>
<td>142,962</td>
<td>142,201</td>
<td>95.45</td>
</tr>
<tr>
<td>1919</td>
<td>175,442</td>
<td>171,216</td>
<td>97.65</td>
</tr>
<tr>
<td>1920</td>
<td>199,139</td>
<td>232,375</td>
<td>116.67</td>
</tr>
<tr>
<td>1921</td>
<td>161,765</td>
<td>243,484</td>
<td>150.52</td>
</tr>
<tr>
<td>1922</td>
<td>171,986</td>
<td>194,195</td>
<td>112.92</td>
</tr>
<tr>
<td>1923</td>
<td>189,297</td>
<td>183,205</td>
<td>96.78</td>
</tr>
<tr>
<td>1924</td>
<td>219,046</td>
<td>198,307</td>
<td>90.53</td>
</tr>
<tr>
<td>1925</td>
<td>231,889</td>
<td>176,482</td>
<td>76.10</td>
</tr>
<tr>
<td>1926</td>
<td>228,527</td>
<td>175,392</td>
<td>76.75</td>
</tr>
</tbody>
</table>

*Note.* – The salaries and wages of the staff were improved in 1920 owing to the increased cost of living.

The Sierra Leone Railway is self-contained in its administration and working, but is a Department of Government. The headquarters of the railway are at Freetown, the capital of the Colony. The organisation is of the departmental type [...] it will be seen that the General Manager (Mr. C.R. Webb) also holds the position of Traffic Manager, and has a Deputy Traffic Manager to assist him on that side. The number of permanent staff employed at the end of 1926 was 2,045, of whom 59 were Europeans and 1,986 Africans.

The railway owns, works and maintains the cranes on the jetties and wharves at Freetown. In addition to the locomotive shops and Chief Mechanical Engi-
ner’s office, the office and shops of the Chief Engineer and general stores are at Cline Town, where also most of the European officers of the railway reside. The offices of the General manager, Traffic Manager and Chief Accountant are at or near Water Street station in Freetown.

Permanent Way and works.

The gauge of the line throughout its length is 2 ft. 6 in., with a maximum gradient on the main line of 1 in 50 and a maximum curvature of 330 ft. radius, with the exception of the section in East Street, which is 1 in 40 and a curve at Rock Street, which has a radius of 297 ft. On the mountain line the maximum gradient is 1 in 22, and the greatest curvature 132 ft. radius. The gauge is, of course, narrower than that of other British possessions in West Africa, with the exception of a branch of the same gauge in Nigeria; but as Sierra Leone is entirely isolated from the nearest of these possessions by foreign territory the question of a uniform gauge is not likely to arise.

The permanent way consists of 30 ft. rails of 28 and 30 lb. to the yard on steel sleepers of 35 and 44 lb. and 4 ft. 7 1/4 in. in length. The sleepers are set 2 ft. 6 1/2 in. apart on the straight, and 2 ft. 4 in. on curves, and there is a 2-in. super-elevation on maximum curvature. In the course of extensive relaying which has become necessary 30-lb. rails are being used, and considerable improvements are being made in the way of re-alignment, regrading and the straightening out of the sharper curves. The track is mostly earth-ballasted to a depth of 7 in., gravel ballast being used in parts. The railway is fortunate (particularly in view of the heavy rainfall) in having for the most part a good road bed consisting mostly of laterite gravel. The axle-load is limited to 5 tons.

The maintenance of the track is carried out by gangs of seven or eight labourers in charge of a ganger, who in turn is supervised by a foreman platelayer responsible for about 20 miles of line, which he inspects daily. The line is divided into three sections each in charge of an assistant engineer.

The railway possesses 139 bridges each with spans of 20 ft. or over. Of special note amongst them are the six-span bridge at Sewa, 716 ft. long, the nine-span bridge at Ribbi, 662 ft. long, the five-span bridge at Moa, 633 ft. long, and the ten-span bridge at Taia, 589 ft. long. The structure of these bridges is of steel supported on concrete foundations, and in many cases concrete piers have been used. Many of the bridges are of considerable height, the Orogoo bridge being 74 ft. 3 in. from rail level to bed of river.

Locomotives and Rolling-Stock.

Of the 43 locomotives on the books, three are Garratts, 17 tender engines of the 4-8-0 type and 23 tank engines. The Garratt locomotives are of the 2-6-2 + 2-6-2 type and were introduced in 1926. Their introduction on this line
was of particular interest because it is thought that Sierra Leone was the first Crown Colony to introduce this type of engine, and it is believed that these three locomotives were the first of the type to be made for a 2-ft. 6-in. gauge and an axle-load limit of 5 tons. They have proved very useful and successful. Their maximum load is 200 tons (reduced to 180 tons in the wet season), but it is considered that this will not prove to be their limit under good rail conditions.

The average coal consumption for all locomotives in 1926 was 21.48 lb. per engine-mile, and the consumption of oil 9.4 pints per 100 engine-miles. The rather high average oil consumption is due to the fact that owing to the small wheels the motions and side rods of the locomotives are very near the ground and get covered with dust or mud. The number of engine failures in 1925 was 34, or 1 per 18,419 miles. A comparison with 1926 is not given, owing to the conditions produced by the strike in the latter year, but the figures for the ten months after the strike were better than those for 1925.

The passenger stock consists of 85 vehicles, 10 being first-class coaches, 8 first and second-class composite coaches, 5 second-class coaches, 3 second and third-class composite coaches, 11 baggage and mail vans, 7 saloons and railway officers’ coaches, 1 coach for Government officials, 1 ambulance coach and 1 pay coach. The freight stock numbers 343 units, 182 being covered goods wagons of capacities varying between 8 and 13 tons. 66 low-sided wagons of 8 tons capacity and 54 high-sided wagons (including 9 steel lattice-sided wagons) of 8 tons capacity; and there are 24 8-ton and 1 12-ton flat cars, 4 cattle trucks, 2 breakdown vans, and 1 travelling workshop. All new covered goods wagons are of 13 tons capacity.

The railway workshops are situated at Cline Town on the outskirts of Freetown, and they are now being extended and reorganised. A number of new machines are being installed, and it is hoped that electric power from the new town power station will soon be available. The principal engine depot is also at Cline Town, but there are engine sheds at Bauya, Magburaka, Bo and Pendembu. The whole of the main-line traffic is worked by African enginemen. In addition to the requirements of the railway, the shops, being the only works of the kind in the Colony, are frequently called upon to undertake other work.

**Passenger and Goods Traffic.**

Three classes of passenger traffic are provided for, except on the mountain line, where two classes of accommodation only (first and third) are provided. Seven stations in the Protectorate booked over 7,000 passengers during 1926. The punctuality of passenger trains is good, as in 1926 the average time of arrival of passenger trains at right time and up to 5 minutes late was 91 per cent. The railway is in the happy position – rather unusual in these days – of having no competition worth mentioning either as regards goods or passenger traffic.
By far the most important traffic of the railway consists of palm kernels, which gives more than half the goods revenue. During 1926, 37,089 tons of palm kernels were conveyed, the receipts therefrom amounting to £95,352. Other traffics of importance were palm oil, 2,279 tons; rice, 4,461 tons; salt (imported), 2,858 tons; ginger, 2,794 tons. Nine stations (which do not include the Freetown stations, which deal principally with imports loaded in an upward direction) despatched more than 2,000 tons of goods traffic during the year 1926, the principal traffic points being Pendembu, 8,001 tons, and Blama, 7,245 tons.

The traffic is mainly long-haul, seven of the principal traffic points being at a greater distance from Freetown than half the longest possible haul, and all of them being over 100 miles from the port of Freetown, to which the traffic is conveyed. Very little livestock is dealt with by the railway.

The construction of motor roads in the Protectorate is proceeding. Most of these roads are in the nature of feeders to the railway, and as they increase in length and number they should induce an increase of traffic to the railway. The alternative to motor transport is the slow, expensive and generally unsatisfactory and uneconomical head transport.

Much improvement in the working and running of trains, and in the better and more economical distribution and movement of wagons, has been brought about by the introduction of a Traffic Control Section, which was inaugurated towards the end of 1923, and which will become still more effective when the telephone system (Western Electric) now being installed is completed, and the more important stations and engine depots are brought into direct communication with the Control Office in Freetown. So far telephones have been installed at various places between Freetown and Bo, a distance of 136 miles.

Trains are worked on the electric staff system. The maintenance of the staff instruments is carried out by the Telegraph and Telephone Section, which is in direct charge of a telegraph engineer, who forms part of the Chief Engineer’s staff. The telegraph and telephone system of the Colony is constructed, maintained and operated by the railway. In 1926 the total line mileage was 1,269 miles, as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telegraph and telephone lines along the railway</td>
<td>511</td>
</tr>
<tr>
<td>Telegraph and telephone lines (used for the trans-</td>
<td>213</td>
</tr>
<tr>
<td>mission of telegraph messages) off the railway</td>
<td></td>
</tr>
<tr>
<td>Electric train staff lines</td>
<td>336</td>
</tr>
<tr>
<td>Telephone lines in Freetown</td>
<td>209</td>
</tr>
</tbody>
</table>

A further 272 miles of wire, comprising the Traffic Control line to Bo, has since been added. This is a metallic circuit. The maintenance of the lines is rendered difficult owing to damage by tornadoes, and sometimes also by bush fires during the dry season.
THE CAPE TO CAIRO RAILWAY.

An Anglo-African Correspondent Describes the various Steps taken towards Realising Cecil Rhodes’s Dream of Railway Communication between the Cape and Cairo.

THERE was, of course, no thought of Cairo as an objective when, in the late 'fifties, the first tiny link in the great railway chain from Southern Africa to the North was commenced between Cape Town and Wellington. This was a stretch of 57 miles, built to the 4-ft. 8 1/2-in. gauge, but subsequently reduced to 3 ft. 6 in., the first sod of which, it is interesting to recall, was turned by that great statesman, the late Sir George Grey, then Governor of the Cape Colony. This section, which was opened in 1863, was built by the Cape Town, Wellington & Docks Railway Co. Ltd., and was acquired by the Cape Government on January 1, 1873, under Act No. 15 of 1872. Subsequently the line was extended another 60 miles or so to Worcester. The chief engineering difficulties of this first link in the Cape-Cairo railway occur in the mountainous and picturesque region known as Hex River, where the line climbs to an altitude of 3,588 ft., and where there are many sharp gradients and curves and rock cuttings and precipitous embankments. Thereafter – passing Matjesfontein, Beaufort West, De Aar, Kimberley and Vryburg (the last-named being 780 miles from Cape Town) – the track is laid on comparatively smooth ground. Kimberley was reached in 1885 and Vryburg in 1890.

Cutting Africa through the Centre.

That distinguished journalist, the late Mr. W. T. Stead,27 once facetiously observed that but for Mr. Cecil Rhodes, the Cape to Cairo railway would have got itself built in sections and it would never have been discovered that it was a Cape to Cairo line until the last gap had been bridged and the trains were actually running. It is, we believe, a fact that the phrase ‘Cape to Cairo’ was originated by Sir Charles Metcalfe, Bart., the eminent railway engineer, who used it in an article on African railway projects which he wrote in 1889 for an English magazine. But long before that the idea of linking southern and northern Africa by means of a telegraph wire had been conceived by Mr. (afterwards Sir) James Sivewright, who was then in the service of the Cape Government, and that particular project was actually started. It remained, however, for Mr. Rhodes, round about the year 1890, to crystallise the idea of north-south railway communication. At that period, following the marvellous gold discoveries in the Witwatersrand several years before, South Africa was attracting world-wide attention. Mr. Rhodes’s enthusiasm, was, however, based on sound business instinct. He persistently deprecated the popular notion that the railway was being built merely in order that a human being might be able to ‘get in at Cairo and get out at Cape Town.’ Ten years later, writing to Mr. (now Major) Ewart S. Grogan,28 a daring young Cam-
bridge undergraduate, who had actually traversed Africa from south to north, Mr. Rhodes said: ‘The object is to cut Africa through the centre, and the railway will pick up trade all along the route. The junctions to the east and west coasts, which will occur in the future, will be outlets for the traffic obtained along the route of the line as it passes through the centre of Africa. At any rate, up to Bulawayo, where I am now, it has been a payable undertaking, and I still think it will continue to be so as we advance into the far interior. We propose now to go on and cross the Zambesi just below the Victoria Falls. I should like to have the spray of the water over the carriages.’

That letter was written in 1900, two years before the death of the writer.

The preceding decade was a period of great activity in the work of extending the railway from Vryburg to Mafeking and thence to Bulawayo and the Zambesi. The contractors for the work were Pauling & Co. Ltd. (who had built the line from Kimberley to Vryburg) and the engineers were Sir Charles Metcalfe and Sir Douglas Fox. The gauge was to be the same as the Cape line, viz., 3 ft. 6 in., and the British South Africa Company advanced the money required for the construction of the line. The contract price for the Mafeking section was, it is understood, £2,575 per mile.

The Last Lap to Bulawayo.

The Bechuanaland Railway Company – now known as the Rhodesia Railways Limited – had no intention of letting the grass grow under their feet. No sooner was the Mafeking extension completed than the contractors started on the next step towards Cairo, and before the end of 1894 the line to Gaberones, Palapye and Bulawayo was well under way. The Gaberones section was opened in July, 1895, and two years later, with the completion of the line to Bulawayo – 1,360 miles from Cape Town – Mr. Rhodes was enabled to confound his critics by the fact that up to that stage, at any rate, the Cape to Cairo railway was anything but a ‘wild cat’ scheme. The difficulty in getting material through sufficiently quickly retarded construction as the track neared Bulawayo, and it is on record that Mr. Rhodes was so impatient to see the iron horse reach that objective that he offered the contractors an extra £200 per mile to lay a mile of metal a day. The result was that the ‘last lap’ was so hurriedly laid that, with the first heavy rains, the contractors had to face some rather serious washaways. But all that was subsequently remedied, and when once the trains were run into Bulawayo the contractors went back over the line and carefully completed the work in accordance with their contract.
November 4, 1897, was a red-letter day, not only in the history of Bulawayo, but also in that of the railways of South Africa. Leading men from all parts of South Africa, and many eminent person from Great Britain, forgathered in the town to celebrated the occasion. Mr. Rhodes was down with fever, and therefore could not be present, but high tribute to his foresight and energy was paid by Sir Alfred (afterwards Lord) Milner, the High Commissioner, at a banquet given on the occasion. ‘Few events of the century’, wrote Sir Henry M. Stanley, the distinguished explorer, who was present, ‘surpass it in interest and importance’ – marking, as it did, ‘the conclusion of an audacious enterprise’.

Despite this triumphal progress, Mr. Rhodes found it no easy matter, a year or two later, to gain the financial co-operation of the Imperial Government to enable him to extend the railway and the telegraph line from Bulawayo, across the Zambesi in the direction of Abercorn at the southern extremity of Lake Tanganyika – the idea then being to join up with Tabora, in what was then German East Africa but is now Tanganyika Territory. So he went to Berlin to seek the help of the German Government, and was so cordially received by the Kaiser that before he left the German capital he had practically arranged (in spite of newspaper criticism of his scheme) that his telegraph and railway should run through German East Africa, although it was believed that he actually had in his pocket at the time a concession to take his lines through Belgian territory – that is, the Congo, on the west side of Lake Tanganyika. However, soon after his return to London, the financial support he needed was forthcoming from the British South Africa Company and various Rhodesian mining companies, and preparations were at once made to continue the line to the Wankie coalfields, some 200 miles north-west of Bulaway. The work was begun in May, 1901, and completed in September, 1903.

Bridging the Victoria Falls.

From Wankie to the famous Victoria Falls on the River Zambesi is roughly 70 miles. Work thereon was begun in September, 1903, and finished on April 25, 1904, the whole line from Bulawayo to the Falls being opened for traffic on June 20. A few weeks later the first through train from Cape Town started for the north amid enthusiastic demonstrations. Then was commenced what by many is regarded as the most fascinating feature of this particular portion of the Cape to Cairo railway, viz., the construction of the Victoria Falls bridge. It is a record bridge in many respects, being the highest – 420 ft. – in the world, and it was constructed in the short period of 19 weeks. It was designed by Sir Charles Metcalfe, consulting engineer in Africa of the Rhodesia Railways Limited, and Mr. G. A. Hobson, M. Inst. C.E., of the firm of Sir Douglas Fox & Partners. The
work of construction was under the immediate charge of Mr. G. C. Imbault, who had with him a staff of English bridge builders, which never exceeded 25 men, and about 100 native labourers. Mr. Imbault practically superintended the construction of the bridge at Darlington, where it was made by the Cleveland Bridge & Engineering Co. Ltd., and also its erection across the Zambesi. The total length of the bridge is 650 ft., of which the central span accounts for 500 ft. between the pin centres on the two banks, the balance being made up of the two short spans. The two ends of the bridge, which were built from both sides of the gorge simultaneously, met so exactly that there was not a difference between them of an eighth of an inch. The girders were joined on April 1, 1905. Sir Charles Metcalfe once claimed that no other bridge of its size and capacity had ever been built so cheaply. Its erection was not effected without opposition, and it is curious to recall that Mr. Rhodes’s brother, the late Colonel Frank Rhodes, made no secret of his objection to the bridge, the site for which, he declared, ‘had been chosen in a hurry, and without that careful consideration which should be given when dealing with one of the grandest things in the world’.

Laying the Track to Kalomo.

While the Victoria Falls bridge was building, the work of laying the track north to Kalomo was proceeded with, the necessary material being conveyed across the gorge by a ‘Blondin’ transporter, driven by electricity and with a carrying capacity of 5 tons. In a remarkably short time Kalomo was reached, and later on the Kafue River – about half-way between the Falls and Rhodesia Broken Hill – was successfully crossed by a bridge which is the longest of its kind in Africa, running to nearly 1,500 ft., with 13 spans of 100 ft. each, standing on concrete pillars in 16 ft. of water. Thus Rhodesia has the distinction of possessing the highest and the longest railway bridges in the ‘Dark Continent’.

Early in December, 1909, Bwana Mkubwa was the scene of an interesting gathering of railwaymen and others, who were there for the special purpose of celebrating the passage of the first train across the Belgian border. Under a triumphal arch, gaily decorated with flags and situate in the heart of a forest, the last two fish-plates (made of locally smelted copper) were riveted on either rail by two of the leading personages present – namely, Mr. L. A. Wallace, Administrator of North-western Rhodesia, and Baron Wangere, the representative of the Congo. A few minutes later the special engine and train steamed across the border and pulled up in Belgian territory.
Carrying the Line Through the Congo.

There were not wanting those who predicted the breakdown or entire abandonment of the ‘fantastical Cape to Cairo scheme’, following the death of Mr. Rhodes in 1902, but as a matter of fact the work proceeded – slowly, perhaps, but none the less surely. Not a little of this advancement was due to Mr. Robert Williams, an intimate friend of the late Mr. Rhodes, and a commanding figure in the African railway world. It is on record that before Mr. Rhodes died, Mr. Williams promised him he would do his best to ‘carry his line through the Congo by connecting it to the railways of that State’ – Mr. Williams having originally negotiated with the late King Leopold to build the Cape to Cairo railway through the Congo State to the Nile. As readers of The Railway Gazette are well aware, Mr. Williams has also been the leading spirit in connection with the construction of the Benguella Railway which, beginning at Lobito Bay in Portuguese West Africa, will ultimately join the Katanga district in the Belgian Congo and link up with the Cape to Cairo railway at some point north of Elizabethville, probably Kambove. In an interesting paper on the Cape to Cairo railway read by him in London a few years ago, Mr. Williams told how the expeditions he had sent out in 1899 and 1901, under the leadership of his ‘splendid colleague’, the late Mr. George Grey, with the object of discovering a mineral area of sufficient importance to draw the line northwards, had already revealed the great copper wealth of Katanga, besides important gold, tin and diamond deposits.

Railhead at Bukama.

‘Suffice to say’, adds Mr. Williams, ‘that it at length arrived at the Congo frontier and that, thanks to the co-operation of King Leopold and of his great financier, Mons. Jadot, thanks also to the consistent effort of his present Majesty King Albert, the railway has now reached Bukama, on the navigable Congo, with the result that to-day one may travel from Cape Town by train and river steamer, running in direct connection with the trains, to Stanleyville, on the north side of the Congo State – a distance of 3,600 miles, of which 3,000 miles is railway – and to the mouth of the Congo River’.

Of the Cape to Cairo line there remain one or two comparatively small links to complete it and one big one. What Mr. Robert Williams calls the ‘small ones’ are along the Congo River, where steamers at present fill the gap. And there is, of course, the Wadi Halfa-Assuan break in Egypt. The big link is that between Stanleyville, in the Belgian Congo, and El Obeid, in the Sudan. This link will presumably run over part of the Darfur plateau and along the Nile Congo Divide. In the aforesaid paper, Mr. Williams revealed the fact that it had long been his desire to arrange for the systematic investigation of the Sudanese side of this Divide in the hope that possible mineral discoveries would attract the Sudan Railway south-
wards to complete this big link between the Cape and Cairo, ‘and thus at last realise Rhodes’s dream’. The opportunity, he says, at last presented itself, and an expedition was despatched under Major Christy to explore this least known of all the great African Divides. The expedition brought back a vast amount of information, ‘much of it of a most encouraging nature, with plentiful indications of yet another heavily mineralised zone’. Mr. Williams goes on to express the hope that ‘further investigation may succeed in locating / deposits sufficiently large and rich to justify the extension of the Sudan Railway southwards to meet an extension of the Kenya & Uganda Railway on the British side of the Divide and to link up with the northward extension from Stanleyville, on the Belgian side,’ and thus finally complete the railway between the two extremities of the continent.

**Lord Cromer’s View of the Scheme.**

Possibly nowadays a more generous view is taken of the Cape-Cairo railway as such by the powers-that-be in Egypt and the Sudan. Time was when precious little enthusiasm was shown there for Mr. Rhodes’s pet project. The late Lord Cromer, in 1904, officially declared that from a purely engineering point of view the establishment of a continuous railway communication from Cairo to Cape Town ‘would be absolutely impossible,’ and he was quite confident that, in view of the very great physical difficulties which would have to be encountered, the cost of constructing any such railway would be altogether out of proportion to its utility. But communication by rail and river was altogether a different matter, as that meant that ‘it would be no longer necessary to construct a railway across vast marshes lying, roughly, between the fifth and tenth parallels of north latitude. I cannot speak with any authority as regards the difficulties which, in the execution of the revised project, might have to be encountered south of Gondokoro. All I need say is that the Egyptian and Sudanese part of the work is already accomplished. A regular tourist service by rail and river now runs from Cairo to Gondokoro.’

**The Egyptian State Railways.**

An outstanding feature of the northern section of the Cape to Cairo railway was the recent gauge conversion on the Egyptian State Railways. When the winter time-table came into operation on November 1 last year, the Egyptian State Railways for the first time worked the whole of their lines, except for 125 miles on the 2-ft. 6-in. gauge, on the 4-ft. 8 1/2-in. gauge. The majority was previously laid to the standard gauge, but until comparatively recently the section from Luxor to Shellal, which was built as a military railway and afterwards taken over by the State, was on the 3-ft. 6-in. gauge. The line was approximately 160 miles in
length, with 19 stations. The Egyptian State Railways are the subject of a special article published on pages 7–11 herein.

**Rhodes’s Dream near Realisation.**

Whether the Sudan Government Railways will, in due course, follow the example of their Egyptian neighbours and change their present 3-ft. 6-in. gauge to the standard measurement is a moot point. Probably they will prefer to keep their track as it is. It may be interesting to recall that the Sudan Government mail steamers connect with the Egyptian State Railways at Wadi Halfa, whence the railway runs south to Khartoum and so to Sennar and El Obeid. The late Lord Kitchener opened to Khartoum-El Obeid Railway in 1912. El Obeid is distant about 430 miles from Khartoum by railway, about 1,000 miles by railway from Wadi Halfa, and about 2,000 miles by railway and river from Alexandria. Through railway communication between Egypt and the Sudan is not available, for there is still a break in the railway of some 200 miles between Wadi Halfa and Assuan, which has to be traversed by river steamer. As General Sir Reginald Wingate once observed: ‘It is possible that subsidiary lines may connect Stanleyville with Rejaf, following the present motor road connecting the important Belgian gold-mining area at Kilo with the Nile in that vicinity – thus turning the Rapids and Dufil and providing a trade route along the navigable Nile waterway to Khartoum, or to the nearest point on the Sudan railway system at Kosti. But should the recent mineral discoveries prove sufficiently large and rich to justify the extension of the Sudan Railway southwards, there is little doubt that the route to be followed will be as Mr. Robert Williams described: and clearly, through his prescience and indomitable perseverance, the wonderful dream of his great chief, Cecil Rhodes, is far nearer completion than any of us had contemplated.’

‘The Desert has Lost its Terrors.’

Alternative routes from Cape Town to the north have more than once been suggested. Twenty-two years ago when the present writer interviewed Sir Charles Metcalfe on the subject of the Cape-Cairo railway, that gentleman observed that in his opinion in the future there would probably be two lines running from Broken Hill in Rhodesia – one going up through the Congo Free State to Lake Chad and right through French territory, coming out perhaps at Algiers, or some other place on the north coast, the other ‘coming up through German East Africa and ultimately joining up with Khartoum and Cairo.’ The late Mr. H. Wilson Fox, M.P., of the British South Africa Company, also held pronounced views on the subject. More recently Dr. L. Dudley Stamp pleaded in the press for the construction of a line running from Calais to Cape Town – this, of course,
involving an 8-mile tunnel under the Straits of Gibraltar and utilising either the Lake Chad-Stanleyville route on the Congo, or ‘a truly international line’ from the Straits of Gibraltar across the Sahara to Nigeria, thence traversing the Congo to the Katanga mining district. This latter suggestion is specially interesting in view of recent activities in connection with the Trans-Saharan railway and the introduction of a Bill into the French Chamber of Deputies authorising the Government to provide 18 million francs to defray the cost of carrying out a technical survey and preparing the final plans for the construction of a line across the Sahara Desert – a scheme consistently advocated for years past. Truly, as an engineering contemporary recently observed, the desert has lost its terrors.
THE RAILWAY GAZETTE.

SOME TYPICAL MODERN LOCOMOTIVES AND ROLLING STOCK FOR AFRICAN RAILWAYS.

On this and the following pages will be found brief descriptions and photographs (not included) of a number of the latest locomotives and most modern carriage and wagon stock specially designed for service in various parts of Africa. In selecting our illustrations we have endeavoured to give as representative a view as possible of the latest practice in the design of locomotives and rolling stock for African railways, and we are indebted to the various railway administrations, locomotive and rolling stock builders and consulting engineers for the following descriptions and illustrations. In order to avoid repetition we have not published more than one photograph of the same or very similar type of locomotive or rolling stock, and in mentioning the builder’s name under the illustration we wish it clearly understood that, of course, very similar locomotives and vehicles may also have been constructed by other builders, but were we to illustrate each one it would only have the effect of making this number monotonous without adding to its value.

Pacific Type Locomotive, South African Railways.

Enlarged 4-6-2 Type Locomotive, Karoo Section, South African Railway, now being built by the Vulcan Foundry Ltd.¹

The diagram on this page shows one of the enlarged ‘Karoo type’ locomotives which the Vulcan foundry Ltd. have now under construction for the Karoo section of the South African Railways. These engines are of the 4-6-2 type, similar to those designed by Mr. H.M. Beattie, C.M.G., the late locomotive superintendent of the Cape Government Railways. They have outside cylinders 19 in. diameter
by 28-in. stroke and coupled wheels 5 ft. 1 in. diameter. The boiler is of generous proportions and fitted with Belapire firebox. It carries a working pressure of 200 lb. per sq. in. and with the fire-box contains a total heating surface of 2,066 sq. ft., while the grate area is 34`2 sq. ft. These proportions equal, and in some respects exceed, those common for the 4-ft. 8½-in., or standard, gauge, and they represent a very great advance for the 3-ft. 6-in. gauge on which, of course, the South African Railways are laid out. The accompanying drawing, for which we are indebted to the makers, clearly shows the leading characteristics of the design which, as might be expected, is typically British throughout its main particulars, but it is to be noted that in respect of the framing and cab, and also in the provision of a large headlight and ‘cowcatcher’, American practice is followed.

The engine trailing wheels are carried in a truck pivoted by means of a long arm projecting forward to a point near the front end of the fire-box. The latter it will be noticed has sloping front and back plates and mounted on it are safety valves of the ‘pop’ type. The rigid wheelbase of the engine is very short, viz., 10 ft. 8 in. out of a total base of 29 ft. 5 in. The bogie wheels are 2 ft. 6½ in. and the trailing truck wheels 2 ft. 10 in. in diameter on tread. In working order the engine weighs 69 tons.

The tender is mounted on two 4-wheeled bogies each having a wheelbase of 4 ft. 7 in. The total wheelbase is 16 ft. 9 in. The water capacity of the tender is 4,000 gallons and its coal capacity 10 tons.

Pacific Type Locomotives for the Cape Section, South African Railways.

A few years ago there were constructed at the works of Messrs. Beyer, Peacock & Co., Ltd., of Gorton, some 4-6-2 type passenger locomotives for the Cape Government Railways. These at the time represented a considerable advance on the passenger locomotive standards for that country and although they have now been surpassed in point of weight and power capacity by the new superheated locomotives of the same type, also built at Gorton Foundry, and which we also illustrate and describe in this issue, they are nevertheless interesting, if only as showing the development of the type on South African Railways within the space of a few years.

These earlier locomotives were fitted with outside cylinders to which steam was distributed by inside Stephenson motion. The valves of the balanced flat type worked above the cylinders and were actuated by rocking levers for transferring the motion from the inside gear. The boiler was fitted with a round top fire-box in place of the Belpaire box used in the latest engines.

The proportions were smaller throughout as the following table of dimensions will show:-
### 4-6-2 Type Superheated Steam Locomotive, Pacific Type, South African Railways.

We are indebted to Messrs. Beyer, Peacock & Co., Ltd., of the Gorton Foundry, Manchester, for the photographic reproduction on p.82, and the following particulars of the new Pacific type superheated express locomotives, which they have just built for the South African Railways, under the supervision of their Consulting Engineer, Mr. H.G. Humby, M.Inst.C.E. These engines are of an interesting character. They are of large proportions even for the standard gauge, and especially are the dimensions noteworthy when considered in relation to the 3-ft. 6-in. gauge for which the locomotives are constructed.

Pacific type passenger engines are not new in South Africa, and in the preceding article we have given a short illustrated description of an earlier type having the 4-6-2 wheel arrangement built at the Gorton Foundry. These latest locomotives, however, are altogether heavier and more powerful, and the fact of their using superheated, instead of saturated, steam constitutes an advance on previous standards.

[...] The outside cylinders are fitted with piston valves actuated by Walschaerts’ motion, the middle pair of couple wheels being the drivers. A large boiler with extended smokebox and Belpaire fire-box is employed, and a special feature of the construction, which we illustrate on this page, is a large combined stay and

<table>
<thead>
<tr>
<th>Specification</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinders</td>
<td>18½ in. by 26 in.</td>
</tr>
<tr>
<td>Wheels coupled, diameter</td>
<td>5 ft.</td>
</tr>
<tr>
<td>Leading bogie</td>
<td>2 ft. 4½ in.</td>
</tr>
<tr>
<td>Trailing bogie</td>
<td>2 ft. 9 in.</td>
</tr>
<tr>
<td>Boiler length</td>
<td>14 ft. 17¾ in.</td>
</tr>
<tr>
<td>&quot; diameter outside at front</td>
<td>4 ft. 10¾ in.</td>
</tr>
<tr>
<td>&quot; working pressure</td>
<td>180 lbs. Per sq. in</td>
</tr>
<tr>
<td>Tubes, No.</td>
<td>181.</td>
</tr>
<tr>
<td>&quot; diameter</td>
<td>2 in.</td>
</tr>
<tr>
<td>Tubes length between tube plates</td>
<td>15 ft.</td>
</tr>
<tr>
<td>Heating surface, tubes</td>
<td>1,421 sq. ft.</td>
</tr>
<tr>
<td>&quot; fire-box</td>
<td>107 sq. ft.</td>
</tr>
<tr>
<td>Total heating surface</td>
<td>1,528.5 sq. ft.</td>
</tr>
<tr>
<td>Grate area</td>
<td>26.5 sq. ft.</td>
</tr>
<tr>
<td>Coupled wheelbase</td>
<td>17 ft. 11 in.</td>
</tr>
<tr>
<td>Total wheelbase</td>
<td>27 ft. 6 in.</td>
</tr>
<tr>
<td>Ttractive power per lb. of mean effective pressure in cylinder</td>
<td>148.5</td>
</tr>
</tbody>
</table>
frame junction casting employed for connecting the frames at the wide fire-box end to the main engine frames. These castings were produced in Messrs. Beyer, Peacock & Company's own steel foundry. They are of pure acid open hearth steel of the highest quality. The casting, as shown, weighed approximately 38 cwt., a test piece from it gave the following mechanical tests:—

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength</td>
<td>30·40 tons per sq. in.</td>
</tr>
<tr>
<td>Elongation in 2 in.</td>
<td>29·5 per cent</td>
</tr>
<tr>
<td>Contraction of area</td>
<td>35·8 per cent</td>
</tr>
</tbody>
</table>

A 1-in. square bar bent cold round a bar of 1¼ in. radius to an angle of 90 degrees unbroken.

The trailing engine wheels take the form of a truck pivoted by a forward extension or arm at the front of the fire-box. A commodious cab is provided, and the equipment includes the vacuum automatic brake, a dynamo for generating electric current for the headlights, and the Wakefield mechanical lubricator. The super-heater is of the well-known Schmidt type. The leading dimensions are as follows:—

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinders, diameter and stroke</td>
<td>20 in. by 28 in.</td>
</tr>
<tr>
<td>Wheels coupled, diameter</td>
<td>5 ft. 2 in.</td>
</tr>
<tr>
<td>Bogie wheels (front), diameter</td>
<td>2 ft. 4½ in.</td>
</tr>
<tr>
<td>&quot; wheels (hind), diameter</td>
<td>2 ft. 9 in.</td>
</tr>
<tr>
<td>Boiler, length of barrel</td>
<td>18 ft. 1¼ in.</td>
</tr>
<tr>
<td>&quot; diameter of barrel</td>
<td>4 ft. 8 in.</td>
</tr>
<tr>
<td>&quot; No. of tubes and diameter</td>
<td>95=2¾ diam. 18=5¼ diam.</td>
</tr>
<tr>
<td>Superheated tubes</td>
<td>1½ in. diam</td>
</tr>
<tr>
<td>Fire-box, length at bottom</td>
<td>6 ft. 5/16in.</td>
</tr>
<tr>
<td>&quot; width at bottom</td>
<td>5 ft. 4½ in.</td>
</tr>
<tr>
<td>&quot; shell, length at bottom</td>
<td>7 ft. 3 in.</td>
</tr>
<tr>
<td>&quot; shell, width at bottom</td>
<td>6 ft. 1½ in.</td>
</tr>
<tr>
<td>Heating surface tubes</td>
<td>1,494·5 sq. ft.</td>
</tr>
<tr>
<td>&quot; fire-box</td>
<td>132·5 sq. ft.</td>
</tr>
<tr>
<td>&quot; total</td>
<td>1,617 sq.ft.</td>
</tr>
<tr>
<td>Superheater heating surface</td>
<td>359 sq. ft.</td>
</tr>
<tr>
<td>Grate area</td>
<td>34·6 sq. ft.</td>
</tr>
<tr>
<td>Working pressure</td>
<td>180 lb.</td>
</tr>
</tbody>
</table>

The wheelbase of the engine is 30 ft. 2 in., and the weight in working order 74 tons 9 cwt. The eight-wheeled tender has accommodation for 4,000 gallons of water and 10 tons of coal; the bogie wheels are 2 ft. 9½ in. diameter, and the wheelbase 16 ft. 9 in. In full working order the tender weighs 49½ tons.

These engines may be said to represent a marked development in South African locomotive standards.
2-8-0 Engines, Lagos Government Railway.

These engines, which are illustrated on p. 83, were recently built for the Lagos Government Railway by Messrs. R. & W. Hawthorn, Leslie & Co., Newcastle-on-Tyne. They are of the 2-8-0 type, with double-bogie tenders. The engines have large boilers with Belpaire type fire-boxes, and, as can be seen from the illustration, have cabs on both engine and tender to protect the enginemen from the sun and rain, as the Nigerian climate is both hot and damp. The boiler is carried at the smoke-box end by an iron casting, which also forms the cylinder cross stay and the pony centre support. The cylinders which drive on to the third pair of coupled wheels have Richardson’s balanced slide valves operated by Walschaerts’ type valve gear.

The coupled wheels are compensated throughout, and all are braked, the power being derived from a horizontal steam brake cylinder. Sanding is provided for leading and trailing wheels. The bogies on which the tender is carried have Fox’s patent pressed steel frames.

The tender frame is built of channel sections stiffly braced at the ends and centre, and the tanks are designed to carry 2,000 gallons of water and 125 cub. ft. of fuel (or 2¾ tons coal). Large tool boxes are fitted both on top of tank and in engine cab. The tender is provided with both steam and hand screw brakes. Central buffers and drawgear of the standard type used on the West African Government Railways are fitted.

In the accompanying table are given the leading dimensions of these engines:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge of railway</td>
<td>3 ft. 6 in.</td>
</tr>
<tr>
<td>Cylinders, diameter</td>
<td>17 in.</td>
</tr>
<tr>
<td>&quot; stroke</td>
<td>21 in.</td>
</tr>
<tr>
<td>Coupled wheels, diameter</td>
<td>3 ft. 4 in.</td>
</tr>
<tr>
<td>Pony wheels, diameter</td>
<td>2 ft. 4 in.</td>
</tr>
<tr>
<td>Boiler</td>
<td></td>
</tr>
<tr>
<td>Working pressure</td>
<td>160 lb per sq. in.</td>
</tr>
<tr>
<td>Diameter, inside</td>
<td>4 ft. 8 in.</td>
</tr>
<tr>
<td>Length of barrel</td>
<td>9 ft. 10 in.</td>
</tr>
<tr>
<td>&quot; fire-box</td>
<td>8 ft. 6 in.</td>
</tr>
<tr>
<td>Heating surface, tubes</td>
<td>1,163 sq. ft</td>
</tr>
<tr>
<td>&quot; fire-box</td>
<td>124 sq. ft.</td>
</tr>
<tr>
<td>&quot; total</td>
<td>1,287 sq. ft</td>
</tr>
<tr>
<td>Grate area</td>
<td>17·75 sq. ft</td>
</tr>
<tr>
<td>Wheelbase, engine, rigid</td>
<td>12 ft. 3 in.</td>
</tr>
<tr>
<td>&quot; engine, total</td>
<td>19 ft. 3 in.</td>
</tr>
<tr>
<td>&quot; tender</td>
<td>13 ft.</td>
</tr>
<tr>
<td>&quot; engine and tender total</td>
<td>40 ft. 9¾ in.</td>
</tr>
<tr>
<td>Capacity of tank</td>
<td>2,000 galls.</td>
</tr>
<tr>
<td>Fuel space</td>
<td>125 cub.ft. (2¾ tons coal)</td>
</tr>
</tbody>
</table>
Weights in working order –

<table>
<thead>
<tr>
<th></th>
<th>tons</th>
<th>cwt</th>
<th>qr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine</td>
<td>42</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>Tender</td>
<td>23</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>66</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

Mogul Locomotives for the South African Railways (Hopefield Section).

Some locomotives supplied by the Baldwin Locomotive Works\(^8\) for working on the Hopefield section of the South African Railways are of the Mogul or 2-6-0 pattern, and of one of these we publish an illustration on page 82. The gauge is 2 ft., and the locomotives are naturally restricted in size. They have outside cylinders and bar framing, with a system of spring compensation in accordance with American practice. The boiler is of the straight pattern with extended smokebox, and it contains 68 iron tubes, each 2 in. diameter by 10 ft. 9½ in. long. The total heating surface is 423·8 sq. ft. and the grate area 7·6 sq. ft.

The cylinders drive on the middle pair of coupled wheels, and steam is distributed to them by balanced slide valves working on top. Outside fly cranks are employed and hanging crossheads with double-slide bars are fitted. The cylinders are 11¾ in. diameter by 16-in. stroke, and the coupled wheels have a diameter on tread of 2 ft. 9 in. The wheelbase is 7 ft. for the coupled wheels, and 12 ft. 10 in. for the complete engine. A working pressure of 180 lb. per sq. in. is carried by the boiler.

The tender is of the double-bogie pattern, with a coal space of three tons and water capacity of 1,500 gallons. Engine and tender in working order weigh 33 tons.

[...] 4-8-0 Type Superheater Locomotive, Lagos Railway.

Two 4-8-0 locomotives of the type illustrated on page 83 have recently been delivered by Messrs. Nasmyth, Wilson & Co., Ltd., of Patricroft, near Manchester, to the order of the Lagos Government Railway (Southern Nigeria Line).\(^9\) These locomotives are designed to haul train-loads of 300 to 320 tons on gradients of 1 in 80 and loads of about 220 tons on gradients of 1 in 50. Rails of 50 lb. and 55 lb. per yard respectively are used, and the axle-loads are limited to 10 tons. The superheating apparatus is of the well-known Schmidt type, and Walschaert's mechanical lubricators are fitted. These are the first superheater engines to be put to work on West African Railways. The large smoke tubes for the superheater pipes are of solid drawn steel fixed in the tube plates, and the fire bars are of cast-iron and supported by strong bearers secured to the bottom ring of the box. The link motion is of the Walschaerts' type, and reversing is by means of a
screw fixed on the right-hand side of the engine. The following is a table of the leading dimensions and weights:–

**Engine:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Size/Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinders</td>
<td>18 in. diameter, 23-in. stroke</td>
</tr>
<tr>
<td>Coupled wheels</td>
<td>3 ft. 6¾ in. diameter</td>
</tr>
<tr>
<td>Bogie</td>
<td>2 ft. 4½ in. diameter</td>
</tr>
<tr>
<td>Wheelbase, rigid</td>
<td>12 ft.</td>
</tr>
<tr>
<td>&quot; total</td>
<td>21 ft. 3½ in.</td>
</tr>
<tr>
<td>Number of tubes</td>
<td>112.</td>
</tr>
<tr>
<td>Large tubes, diameter outside</td>
<td>5¼ in.</td>
</tr>
<tr>
<td>Heating surface, tubes</td>
<td>766 sq. ft.</td>
</tr>
<tr>
<td>&quot; fire-box</td>
<td>112 sq. ft.</td>
</tr>
<tr>
<td>&quot; superheater</td>
<td>170 sq. ft.</td>
</tr>
<tr>
<td>Total</td>
<td>1,048 sq. ft.</td>
</tr>
<tr>
<td>Grate area</td>
<td>17.5 sq. ft.</td>
</tr>
<tr>
<td>Weight in working order</td>
<td>49 tons 5 cwt.</td>
</tr>
</tbody>
</table>

**Tender:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Size/Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity, water</td>
<td>2,000 gallons</td>
</tr>
<tr>
<td>&quot; fuel</td>
<td>157 cub. ft or 3½ tons</td>
</tr>
<tr>
<td>Weight in working order</td>
<td>25 tons 15 cwt.</td>
</tr>
<tr>
<td>Engine and tender weight in working order</td>
<td>75 tons.</td>
</tr>
</tbody>
</table>

Three additional locomotives identical with the two described and illustrated (with the exception that A.B.C. couplers are included) are now under construction by Messrs. Nasmyth, Wilson & Co., Ltd., for use on the Lagos Railway, where a through rail service is shortly to be inaugurated from the Port of Lagos, the capital of Southern Nigeria, to Minna, the junction with the Baro Kano Railway, 30 hours to be the time occupied in transit.

This weekly mail train, which will connect with both the outward and homeward mail steamers at Lagos, will consist of saloon carriages provided with every modern convenience, including comfortable sleeping accommodation, lavatories and bathrooms, and fitted throughout with electric lights and fans. A restaurant car will be a special feature in connection with this service.

**Tank Locomotive, Lagos Railway.**

By the courtesy of Mr. Frederic Shelford, we illustrate on page 82 an 0-6-0 shunting tank locomotive built by the Hunslet Engine Co., Ltd., Leeds, for the Southern Nigerian Lagos Railway. This engine has cylinders 13 in. by 18 in.; heating surface 531 sq. ft., grate area 9.2 sq. ft., total weight 28 tons.
Speed Indicators and Recorders on African Railways.

An interesting feature of locomotive practice on the South African Railways is the use of speed indicators and recorders, the type mostly used being the Hasler Speed Indicator & Recorder (sold by the Hasler Telegraph Works, of 26, Victoria Street Westminster, S.W.) Such instruments are fitted to locomotives to serve two ends:— (1) As a precautionary measure against the occurrence of accidents due to excessive speed, and (2) as a means of assisting the driver to keep up to his scheduled running times. This subject was dealt with at some length on page 20 of Mr. W. W. Hoy’s Report on South African Railways for the year ending December 31, 1910, and is referred to in this issue.

In the first place, the knowledge that all movements of the engine (speeds attained at any point, time the engine is at work and duration of stops, and distance covered) are being registered on the chart undeniably has a moral effect on the driver, and in particular, is sufficient to deter him from reckless driving on portions of the road where in the interest of safety the speed must be reduced. Again, the indicator needle shows him the actual speed he is making at any moment, and this is of great assistance, particularly at night time, when it is especially difficult to gauge speeds accurately.

In the second place, it sometimes happens that through excess of caution, time is lost through running the trains more slowly than is actually necessary over sections where, by means of notice boards for example, drivers are warned not to exceed a certain speed. Here again, the installation of a speed indicator demonstrates its value, as the train can be kept up to the maximum speed allowable without infringing regulations, or endangering lives. Again, as mentioned above, the duration of all stoppages is clearly shown on the chart, so that loss of time through over long halts is readily detected, and disputes which occasionally occur over the timing of station stops are settled by referring to the speed recorder diagram.

The makers of the Hasler instrument have endeavoured to produce a speed indicator and recorder which will, as nearly as possible, indicate and register the momentary speeds, whilst retaining all the advantages of an entirely mechanical action. It conforms to the changes of speed every second, and the registration of speed is effected every three seconds, so that for all practical purposes the delay in the setting of the needles is negligible. In this respect, the makers justly claim that their instrument reaches a higher standard of accuracy than any other speed indicator and recorder having an entirely mechanical action.

Another great advantage possessed by the Hasler apparatus is that all registrations are punctured into the paper, not traced on the surface with a marker. Hasler diagrams therefore are permanent, and cannot be effaced or falsified in any way.
The instrument is very strongly built to withstand the severe conditions of railway service, and is easy inexpensive to maintain. The driving shaft is geared down so that it rarely makes more than 70 or 75 revolutions per minute, and it will therefore be appreciated that the wear on all moving parts is reduced to a minimum.

NORTH BRITISH LOCOMOTIVES IN AFRICA.

Herewith we give brief particulars of some typical locomotives recently built by the North British Locomotive Co., Ltd., for the South African, Sudan Government, and Nigerian Railway systems respectively, five of which are illustrated on pages 81 and 83.

[...]  

Mallet ‘Simple’ South African Railways.

Type 2-6-6-2. Gauge of railway, 3 ft. 6 in.

ENGINE.

Cylinders –

Diameter 15 in.
Stroke 23 in.

Wheels –

Coupled, diameter 3 ft. 6¼ in
Bogie, " 2 ft. 6 in.

Wheelbase –

Rigid 8 ft. 6 in.
Total 38 ft. 3 in.
Engine and tender 58 ft. 5½ in.
Working pressure 170 lb. per sq. in.

Heating surface –

<table>
<thead>
<tr>
<th>Part</th>
<th>Surface Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire-box</td>
<td>115 sq. ft.</td>
</tr>
<tr>
<td>Tubes (large)</td>
<td>357 sq. ft.</td>
</tr>
<tr>
<td>&quot; (small)</td>
<td>983 sq. ft.</td>
</tr>
<tr>
<td>Superheater</td>
<td>346 sq. ft.</td>
</tr>
<tr>
<td>Total</td>
<td>1,801 sq. ft.</td>
</tr>
<tr>
<td>Firegrate area</td>
<td>32 sq. ft.</td>
</tr>
<tr>
<td>Boiler feed, two injectors</td>
<td>No. 10</td>
</tr>
<tr>
<td>Ttractive force at 75 per cent. of boiler pressure</td>
<td>31,233 lb.</td>
</tr>
</tbody>
</table>
Weight –

In working order 72 tons 2 cwt
On coupled wheels 59 tons 8 cwt

Tender

Tank capacity 3,000 galls.
Fuel space 270 cub. ft.
Weight, full 37 tons 12 cwt.

4-8-2 Locomotive, South African Railways.

Gauge of railway, 3 ft. 6 in.

ENGINE.

Cylinders –

Diameter 21 in.
Stroke 24. in.

Wheels –

Coupled, diameter 3 ft. 9½ in.
Bogie, " 2 ft. 4½ in.
Truck 2 ft. 6 in.

Wheelbase –

Rigid 12 ft. 9 in.
Total 30 ft. 9 in.
Engine and tender 55 ft. 6¾ in.
Working pressure 200 lb. per sq. in.

Heating surface –

Tubes 2,582 sq. ft.
Fire-box 136 sq. ft.
Total 2,718 sq. ft.
Firegrate area 34 sq. ft.

Boiler feed, 2 injectors.
Tractive force at 75 per cent. of boiler pressure 34,893 lb.

Weight –

In working order 78 ton 16 cwt.
On coupled wheels 58 ton 19 cwt.

Tender.

Tank capacity 4,000 galls
Fuel space 330 cub. ft.
Weight, full 43 ton 1 cwt.
4-8-0 Locomotive, South African Railways.

Gauge of railway, 3 ft. 6 in.

ENGINE.

Cylinders –

Diameter 19 in.
Stoke 24 in.

Wheels –

Coupled, diameter 4 ft. 0 in.
Bogie, " 2 ft. 4½ in.

Wheelbase –

Rigid 13 ft. 6 in.
Total 23 ft. 3 in.
Engine and tender 48 ft. 4½ in.

Working pressure 180 lb per sq. in

Heating surface –

Tubes 1,183 sq. ft
Fire-box 141 sq. ft
Total 1,324 sq ft
Firegrate area 21.35 sq. ft
Boiler feed, 2 injectors No. 9
Tractive force at 75 per cent. of boiler pressure 24,367 lb.

Weight –

In working order 60 tons 14 cwt.
On coupled wheels 47 tons 15 cwt

TENDER

Tank capacity 3,000 galls.
Fuel space 380 cub. ft.
Weight, full 41 tons 9 cwt.

4-8-2 Locomotive, South African Railways.

Gauge of railway, 3 ft. 6 in.

ENGINE.

Cylinders –

Diameter 20½ in.
Stoke 28 in.
Wheels –

- Bogie 2 ft. 4½ in.
- Coupled, diameter 4 ft. 6 in.
- Radial, " 2 ft. 9 in.

Wheelbase –

- Rigid 14 ft 5 in.
- Total 31 ft 11 in.
- Engine and tender 57 ft. 8¾ in.
- Working pressure 180 lb. per sq. in.

Heating surface –

- Tubes 2,131 sq. ft.
- Fire-box 186 sq. ft.
- Total 2,317 sq. ft.
- Firegrate area 37 sq. ft.
- Boiler feed, 2 injectors
- Tractive force at 75 per cent. of boiler pressure 29,417 lb.

Weight –

- In working order 82 tons 2 cwt
- On coupled wheels 59 tons 2 cwt.

Tender

- Tank capacity 3,500 galls.
- Fuel space 300 cub. ft.
- Weight, full 43 tons 9 cwt.

4-8-0 Locomotive, Baro Kano Railway, West Africa

Gauge of railway, 3 ft. 6 in.

ENGINE.

Cylinders –

- Diameter 17 in.
- Stroke 23 in.

Wheels –

- Coupled, diameter 3 ft. 6¾ in.
- Bogie, " 2 ft. 4½ in.

Wheelbase –

- Rigid 12 ft.
- Total 21 ft. 3½ in.
- Engine and tender 44 ft.
- Working pressure 170 lb. per sq. in.
Heating surface –

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tubes</td>
<td>976 sq. ft.</td>
<td></td>
</tr>
<tr>
<td>Fire-box</td>
<td>112 sq. ft.</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,088 sq. ft</td>
<td></td>
</tr>
<tr>
<td>Firegrate area</td>
<td>17½ sq. ft.</td>
<td></td>
</tr>
<tr>
<td>Boiler feed, two injectors</td>
<td>1 No. 9 and 1 No. 8</td>
<td></td>
</tr>
<tr>
<td>Ttractive force at 75 per cent. of boiler pressure</td>
<td>19,824 lb.</td>
<td></td>
</tr>
</tbody>
</table>

Weight –

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>In working order</td>
<td>48 tons 2 cwt.</td>
</tr>
<tr>
<td>On coupled wheels</td>
<td>37 tons 14 cwt.</td>
</tr>
</tbody>
</table>

TENDER.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank capacity</td>
<td>2,000 galls.</td>
</tr>
<tr>
<td>Fuel space</td>
<td>150 cub. ft</td>
</tr>
<tr>
<td>Weight full</td>
<td>25 tons 2½ cwt.</td>
</tr>
</tbody>
</table>

Mallet Simple Engine with Schmidt Superheater, South African Railways, built by North Locomotive Co., Ltd.

[African Rolling Stock.]

We illustrate on pages 84, 85 and 87 some typical examples of rolling stock built by the Birmingham Railway Carriage & Wagon Company, Ltd., for various parts of Africa. The chief dimensions of these vehicles are given below:

Four-wheeled Open Sheep Wagon, Rhodesia Railways.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Length over headstock</td>
<td>20 ft. 10 in.</td>
<td></td>
</tr>
<tr>
<td>Length inside</td>
<td>20 ft. 6 in.</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>7 ft. 2 in.</td>
<td></td>
</tr>
<tr>
<td>Wheelbase</td>
<td>11 ft.</td>
<td></td>
</tr>
<tr>
<td>Gauge</td>
<td>3 ft. 6 in.</td>
<td></td>
</tr>
<tr>
<td>Load</td>
<td>30,000 lb.</td>
<td></td>
</tr>
</tbody>
</table>

Four-wheeled Covered Cattle Wagon, Rhodesia Railways.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Length over headstock</td>
<td>20 ft. 10 in.</td>
<td></td>
</tr>
<tr>
<td>Length inside</td>
<td>20 ft. 3 in.</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>7 ft. 5 in.</td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>7 ft. 3 in.</td>
<td></td>
</tr>
<tr>
<td>Wheelbase</td>
<td>11 ft.</td>
<td></td>
</tr>
<tr>
<td>Gauge</td>
<td>3 ft. 6 in.</td>
<td></td>
</tr>
</tbody>
</table>
Drop-sided Bogie Wagon, South African Railways.

Length over headstock 37 ft 10 in.
Length inside 37 ft 6¼ in.
Width 7 ft 9 in.
Centres of bogies 24 ft.
Bogie wheelbase 4 ft 9 in.
Gauge 3 ft 6 in.
Load 70,000 lb.

Third-Class Carriage, Gold Coast Government Railways.

Length over platform 45 ft
Length over body 40 ft
Width inside 7 ft 5 in.
Centres of bogies 30 ft.
Bogie wheelbase 5 ft 6 in.
Seating capacity Fitted with lavatory 60 passengers, third class
Gauge 3 ft 6 in.

Native Wagon, Rhodesia Railways.

Length over body 32 ft 4 in.
Length inside 31 ft 8 in.
Width inside 7 ft 4 in.
Centres of bogies 21 ft.
Bogie wheelbase 5 ft.
Gauge 3 ft 6 in.
Seating capacity Fitted with lavatory 40 native passengers.

Dining Car, Mashonaland Railways.

One of the illustrations on page 84 shows a dining car lately built by the Gloucester Railway Carriage & Wagon Company, Ltd., to the order of the British South Africa Company, for use on the Mashonaland Railways. The vehicle is most complete in every respect, and very luxuriously fitted. It is divided in the interior into a dining saloon, serving room, and kitchen, and is fitted in addition with store rooms, pantries, refrigerator, and lavatory.

The body framing is of Moulmein teak, with outside linings of the same material. The window openings are fitted with glass frames, louvre frames and dust screens, all movable and fitted with adjustable sash holders.

The end platforms, in addition to the half-screen of timber, are fitted with storm curtains of the usual South African type. The interior paneling of the dining saloon is finished up to the garnish rail in rich dark mahogany, the panels
and mouldings being of the same material, highly polished. Above the garnish rail the panels and mouldings are of white mahogany, half polished, the ceiling being lined with millboard,\textsuperscript{16} enameled white, and decorated in gold. All the fittings are nickel plated.

In the dining saloon there are four long and four short mahogany movable tables, and seats for 24 passengers. The chairs are upholstered in buffalo hide of sealing wax red colour, and an alcove is arranged over each table, between the windows, for the accommodation of some of the table service.

The kitchen is provided with an open and closed coal stove, with a very comprehensive arrangement of ovens, water boiler, hot water tank, steam heated plate rack, and other fittings, and this compartment is well fitted throughout with shelves, plate racks, cupboards, &c. The floors are covered with $\frac{1}{8}$ in. steel plates, and the sides lined with match boarding, enamelled white right up to the roof. There is a good water service on the car from a tank carried on the underframe, and another in the roof.

The underframe is constructed of steel channel bars, trussed in the manner common to the Cape Government Railways, and the vehicle is carried on bogies, also of the Cape Government pattern, \textit{i.e.}, of the spring bolster type constructed of double-plate steel frames and fitted with elliptical bearing springs and auxiliary coil bearing springs. The car is electrically lighted, and electric bells are provided in each compartment, with electric fans in the saloon. The wheels are of the open spoke pattern, 2 ft. 9½ in. on tread, fitted with wrought iron centres and steel tyres and axles. The car is fitted with automatic vacuum brake.

\textbf{Bogie First-Class Carriage, Egyptian State Railways.}

Carriages of the type illustrated on page 87 are 60 ft. 2½ in. long and 9 ft. 3 in. wide outside body, and run on the 4-ft. 8½-in. gauge. The length over platform headstocks is 60 ft., the length over buffers 63 ft. 3¼ in., centres of bogies 42 ft., and the height from floor to roof inside 9 ft. 5¾ in. The carriage illustrated was built by the Metropolitan Amalgamated Railway Carriage & Wagon Co., Ltd.\textsuperscript{17} It is built of teak, has a monitor roof, and presents a symmetrical external appearance. Two side doors open into the vestibule at each end; these are divided from the corridors by sliding doors. It contains six compartments 7 ft. 6 in. long by 6 ft. 3 in. wide, a coupe compartment (all of which are entered by sliding doors from the corridor), lavatory and w.c. compartment at one end. Movable teak windows and louvre frames are provided to all windows. The seating capacity is 39 passengers. The underframes and bogies are of mild steel. The weight of the carriage is 40 tons.
Day Saloon and Sleeping Carriage Train de Luxe, South African Railways.

This carriage illustrated on page 84 is 60 ft. 3 in. long by 8 ft. 6¼ in. over body, 59 ft. 9 in. long on frame, 44 ft. 6 in. centres of bogies, 6 ft. 1 in. wheelbase; the height of body outside is 9 ft. 1½ in., and the total height of car 12 ft. 2 5/16. from rail. It was built by the Metropolitan Amalgamated Railway Carriage & Wagon Co., Ltd. Entrance is effected from either end by folding doors opening inwards to vestibules, and a side door at each end opening into the same; the corridor is divided from the vestibule by a swing door at each end. The car contains a day saloon 12 ft. 6 in. by 6 ft. 0½ in. inside, three double sleeping compartments 7 ft. 3½ in. by 6 ft. 0¼ in., two single sleeping compartments 4 ft. 6 in. by 6 ft. 0½ in., a lavatory and bath-room for gentlemen and two w.c.'s for ladies. Access to all the sleeping compartments and the day saloon is by means of sliding doors opening from corridor, that the gentlemen's lavatory and bath-room and the ladies' w.c.'s are entered by folding doors from the vestibules.

The day saloon is lighted by four windows. It is fitted with two seats occupying the full width of compartment, and upholstered in green buffalo hide; also provided with washtand, two fixed tables each having two folding leaves forming a table 2 ft. 6 in. by 2 ft. 6 in. when open, and two cane arm chairs. Interior finish of wainscot oak, metallic fittings of brass finished nickel plated, and electric light fittings finished in the same manner.

In the three larger sleeping compartments are two seats, the backs of which are convertible into upper berths, the whole being upholstered in green buffalo hide. These compartments are also fitted with washtand similar to that in the day saloon, and a movable table. Sleeping accommodation is provided for four persons. Interior finish is of polished wainscot oak and metallic fittings, electric light fittings of brass, finished nickel plated.

The two smaller sleeping compartments provide sleeping accommodation for only two persons, having one seat the back of which can be converted into upper berth. They are also fitted with a folding table and washtand. Interior finish is of similar description to larger compartments. All the floors of these rooms are covered with linoleum and carpets of a deep green.

The gentlemen's lavatory and bath-room 5ft. 9in. by 6 ft. 0½ in., which is entered from one of the vestibules, is fitted with a shower bath, two wash-basins with marble slab, a fixed cane seat a narrow table with mirror above, brush and comb box, filter and water bottle, clothes hooks, &c.; the floor is covered with tiles, and hot and cold water is provided. Cupboards for linen, &c. are also fitted at each end. Floors of corridor and vestibules are covered with linoleum of parquetry pattern.
The underframes and bogies are of mild steel; vacuum brake and automatic centre couplers are fitted.

[...]

Covered Goods Wagon, Lagos Railway.

By the courtesy of Mr. Frederic Shelford, we illustrate on page 86 an example of some high capacity bogie stock built by the Bristol Carriage & Wagon Works, Ltd., for the Lagos Railway. These wagons are 32 ft. long and have a capacity for 15 tons with tare 8 tons 19 cwts. The bodies and underframes are of timber.

Third-Class Coach, Lagos Railway.

By the courtesy of Mr. Frederic Shelford, we illustrate on page 85 one of a number of bogie third-class carriages, built for the Lagos Railway by the Bristol Wagon & Carriage Works, Ltd. These vehicles have bodies 40 ft. long with two end platforms, each 2 ft. 6 in. The coaches have a seating capacity for 80 passengers, the bodies are of teak with steel underframes and are fitted with vacuum brake.

Passenger Rolling Stock for Natal.

On page 88 we illustrate one out of a complete equipment of carriages and vans supplied for the Natal Government 2-ft. gauge railways by Messrs. Cravens, Ltd., Darnall, Sheffield. The contract was for the supply of first and second-class composite cars, third-class cars, brake vans, native carriages, &c. The stock is 30 ft. long, with a platform at either end, and is mounted on pressed steel bogies. The underframes are made up of steel channels, angles, &c., and provided with vacuum and hand brakes. The bodies are constructed throughout of teak, the finishing of the first-class compartment being in sycamore and walnut, and the seats upholstered in green buffallo hide. The second-class interiors are finished in teak, the upholstery being in black and gold rep. The native carriages are arranged with hinged seats, &c., so that they may be converted into brake vans when required. All the carriages are provided with sliding lights and louvers, and are ventilated by torpedo air extractors. The lighting of the cars is efficiently provided for by Ridsdale roof lamps.

One of the principal orders executed by this firm was for a special corridor train, supplied to the Natal Government Railways, comprising dining and sleeping cars, kitchen cars and brake vans. The cars are 60 ft. 6 in. long, and are mounted on four-wheeled bogies of the built-up type. The underframes are of steel channels, angles, &c., suitably trussed. The body framing of the cars is of specially selected teak with compound steel bracing and steel panels. The combined sleeping and dining cars have seven compartments, each being provided with a removable flap table for use when meals are served. The total seating accom-
accommodation is for 30 passengers; the seats are arranged that they may be converted into sleeping berths, giving sleeping accommodation for 22 passengers. Lavatory compartments are provided at each end of the carriages, and the necessary cupboard accommodation for linen, &c., is to be found at the centre of the cars. The roofs are of the ‘Monitor’ type, having hinged side ventilators. Sliding lights and louvres are fitted, hit-and-miss ventilators being arranged above these lights. The interior finish is tastefully carried out in satin-wood panels with walnut facias, mouldings, &c. Electric lighting is provided, and also fans for keeping a constant circulation of air; in addition Ridsdale roof lamps are fitted, to be used in case of emergency. A comprehensive system of electric bells is provided.

At one end of this vehicle a bathroom is arranged and provided with a copper shower bath and the usual bathroom fittings. Next to this is a lavatory compartment for the use of the staff. At the opposite end of the car are two sleeping compartments, each capable of accommodating four persons, also a cold storage compartment for carrying meat, provisions, &c.

50,000 lb. Wagons, Mashonaland Railway.

The first photograph on page 85 illustrates one of a large number of wagons recently built for the Mashonaland and other railways by Messrs. Cravens, Ltd., Darnall, Sheffield. These wagons are 34 ft. 4 in. long over headstocks, and carry a load of 50,000 lb., the tare being 24,136 lb. The bogies are of the usual standard pressed steel type. The bodies have rounded ends, which can be removed, the sides being formed of three flap doors, supported at intermediate points by removable channel steel stanchions, so that when necessary the vehicles can be used as platform wagons. The automatic vacuum and hand brakes are fitted to these wagons.

THE SOUTH AFRICAN RAILWAYS’ ROYAL TRAIN.

On pages 56 and 57 we give three illustrations of the complete train placed at the disposal of T.R.H. the Duke and Duchess of Connaught and H.R.H. Princess Patricia during their recent visit to South Africa. This train was fully described in the Railway Gazette for January 20 last, but it is interesting to note that all the vehicles comprising it were designed by the staff of the Mechanical Department of the late Central South African Railways, now merged into the South African Railways, and that, with the exception of two carriages which were built at Durban, Natal, all the others, including the two specially designed Royal saloons, were constructed at the Railway Workshops, Pretoria, Transvaal.

The drawing of the train indicates the position of each carriage relative to the others. Each vehicle is 60 ft. 3 in. over the body, and is carried on two four-wheeled
bogies. The roofs are clerestoried, and the electric light is produced by Stone system. The train is also equipped with the Laycock storage steam heating system, and Laycock-Buckeye couplers are fitted throughout. The total length of the train of 10 carriages is 624 ft. 2 in., and the tare weight 727,600 lb., or 363.8 short tons.

The two Royal carriages, one for the Duke and the other for the Duchess of Connaught, were identical in design inside and outside, and were provided with day and night apartments, bathroom, baggage room, and accommodation for a personal servant. The internal decoration consisted of polished woods, the panels being made of Rhodesian teak, the framing of Nyasaland mahogany and the mouldings of Cape Walnut. The photographs, of course, do not convey the pretty effect obtained by this blending of South African timbers in conjunction with the colour and shade of the trimming and carpets. The prevailing colour of the Duke’s apartment was light green, and that of the Duchess’ light blue. To overcome vibration and soften the noise, sandwich floors, consisting of top and bottom boarding, with sawdust packed between, were adopted, and as a further precaution, extra thick cork linoleum was used for laying on the floor. The plan indicates the general arrangement of the apartments and the disposition of the furniture. The fittings throughout these carriages were specially designed to afford every possible comfort to the Royal passengers, and were supplied by Messrs. W. S. Laycock, Ltd., and the furniture generally was also specially selected.

In the van at one end of the train was carried a complete water sterilising plant, capable of supplying absolutely pure drinking water to every member of the train party. A special design of footstep gear to the Royal carriages was fitted, which enabled the footsteps to be folded out, providing an easy ascent and descent. As these steps, if left in the ‘out’ position when the train was moving, might come into contact with fixed structures, a special connection of the locking gear with the train pipe was devised to make it impossible for the brake to be ‘blown-off’ until the steps had been stowed away and locked, inside the loading gauge.

A NEW TYPE OF COMPOSITE FLAT-BOTTOMED SELF-DISCHARGING WAGON FOR THE UNION OF SOUTH AFRICA RAILWAYS.

[...]

For the Union of South Africa Railways, 165 patent composite wagons of the type illustrated in the engravings are now being put into service. These wagons have been specially designed by the Leeds Forge Company, Ltd., of Leeds, to meet the requirements of railways which have different classes of traffic to deal with in opposite directions, or at different times, and in which, hitherto, the wagons used for taking traffic, such as general merchandise, long steel rails or timber in
one direction, have not been suitable for taking the return traffic, such as coal or minerals, and have consequently, had to be returned without any paying load.

[...]

The wagons are made flat-bottomed so as to be suitable for carrying ordinary merchandise, and the greater part of the bottom consists of doors, which can be let down by turning a handle or hand-wheel, so that the bulk of the contents of the wagon, when consisting of minerals, may be automatically discharged. Another valuable feature of the design is that the door operating gear is fitted entirely below the bottom doors, so that doors of any type can be fitted in the sides of the wagon at any point, or for the full length of the wagon, and the side doorways can be made to reach right down to the level of the floor. This object is attained by constructing the solebar or side frame of the wagon of shallow upper and lower members well braced together, the load being discharged between the two members. By this construction, the solebar possesses sufficient strength, while at the same time there is no deep member above the level of the floor to prevent the easy unloading of rails, timber, &c., at the side of the wagon. It will thus be seen that this type of wagon combines the advantages of several different wagons and avoids the necessity of the railway employing a large number of different types of wagons, each of which types could only be used for certain classes of traffic, with the result that they lie idle for considerable periods.

The bottom door-operating gear is so designed that the weight of the doors and the load on them has no tendency whatever to open them; they are held closed by means of vertical links in pairs which butt directly on to supports on the frame. Any tendency for the links to shake in a direction transverse to the wagon is prevented by the operating screw. The doors, therefore, require no separate locking gear and may always be kept perfectly closed. The whole of the bottom doors are opened or closed in one operation, either by means of the handle placed on the shaft at the / end of the wagon, or on the end of the cross-shaft at either side of the wagon, that is to say, there are three points at any one of which the doors can be operated. The method of operating consists of turning the handle one way for opening and the opposite way for closing, and the doors automatically lock themselves when closed through the levers on the operating shafts and the links connecting the levers to the doors coming into a vertical line. Coil springs are placed at certain positions for the purpose of making it easier to lift the doors to close, but these are not necessary for the working and may be omitted, if desired.

The door-operating gear of this type of wagon can be arranged so that it can be worked from both sides of the wagon or from the end of the wagon. The doors may either be arranged so that the whole of them can be opened simultaneously from one shaft, or they may be divided into groups, each group being worked independently by a separate shaft. In official tests, conducted at the builders’
works, it was found that a period of about 3 minutes was occupied on discharging 90 per cent. of the contents, that is to say, in discharging from the full load to the nearly empty wagon, as shown in one of the photographs, while a further 5 minutes was required by two men to clear the contents by means of shovelling. The total load in the wagon during this test was 35 tons 6 cwt. The whole of the sides of the wagon are made removable for use during rail and timber transport.

 [...] The following is a table of the leading dimensions:

<table>
<thead>
<tr>
<th>Description</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge</td>
<td>3 ft. 6 in.</td>
</tr>
<tr>
<td>Length over solebars</td>
<td>47 ft. 9 in.</td>
</tr>
<tr>
<td>Length inside</td>
<td>45 ft. 0 in.</td>
</tr>
<tr>
<td>Width inside</td>
<td>7 ft. 9 in.</td>
</tr>
<tr>
<td>Height overall</td>
<td>8 ft. 3 in.</td>
</tr>
<tr>
<td>Buffer height (unloaded)</td>
<td>2 ft. 11 in.</td>
</tr>
<tr>
<td>Load</td>
<td>45 tons.</td>
</tr>
<tr>
<td>Net capacity</td>
<td>1,133 cubic ft.</td>
</tr>
<tr>
<td>Tare weight</td>
<td>19 tons 10 cwt. /</td>
</tr>
</tbody>
</table>

**AUTOMATIC CENTRAL BUFFER COUPLERS ON AFRICAN RAILWAYS.**

It is an interesting fact that the Governments of Southern and Northern Nigeria have after extended trials decided to abandon their existing type to central buffer and screw coupling, and adopt an automatic central buffer coupler which has proved itself to be entirely satisfactory on other railways.

We refer to the A.B.C. central automatic buffer coupler, Jepson’s patent. The whole of the new stock built in 1911, for the Southern and Northern Nigeria Railways, including the new 2-ft. 6-in. gauge Bauchi Railway, has been fitted with this coupler, and arrangements have been made for equipping the whole of the existing stock on those railways, as quickly as the Authorities in the Colony can carry out the conversion.

It should be noted that the conditions of service are exceptionally severe on these railways, as the minimum radius of curves is 200 ft., and the length of underframes of saloon cars is 56 ft. 3 in. over headstocks, the bogie centres being 41 ft. apart.

The illustrations on this page show locomotive and wagon stock as supplied to the Bauchi Light Railway of Northern Nigeria, a 35-ton bogie tip wagon, and 15-ton covered goods wagon of the Sudan Government Railway.

The wheelbase of the smallest wagons is 8 ft. 6 in., the length over headstocks being 15 ft. It can be readily understood by those who have had experience of the subject that when the long car is coupled to the short wagon, and the 200-ft. radius curve is being traversed by them, the central buffer coupler must be of
exceptional flexibility, and this condition is achieved by the use of the A.B.C. coupler, which at the same time is claimed to be the tightest coupling on the market to-day. The Sudan Government Railway also has over 200 vehicles in service equipped with A.B.C. couplers.

[...]

**West African Railway Expenditure.** – The Secretary of State for the Colonies was recently asked if he would give the figures for the cost per mile for constructing and equipping the Baro-Kano Railway in Northern Nigeria, the railway in the Gold Coast Colony, the Sierra Leone Railway, and the Uganda Railway. Mr. Harcourt said in reply that the capital expenditure up to the present date had been approximately:

<table>
<thead>
<tr>
<th>Railway</th>
<th>Cost (£ per mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baro-Kano Railway</td>
<td>3,650</td>
</tr>
<tr>
<td>Gold Coast (Sekondi-Coomassie)</td>
<td>10,500</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>4,200</td>
</tr>
<tr>
<td>Uganda</td>
<td>9,700</td>
</tr>
</tbody>
</table>

The above figures included in the case of the last three railways all capital expenditure since they were opened for traffic. The opening of the Baro-Kano Railway for traffic had not yet been announced.

[...]
IMPACT OF RAILWAYS

The impact of railways was immense, affecting the economy and urban geography of the continent and the African way of life. Usually, the sheer cost of construction concentrated the minds of colonial administrators on the development of their fiefdoms. Facing high annual payments on the loan taken out to finance the Uganda Railway, for instance, various Kenyan administrations promoted European settlement of the Highlands and later African production. The exception appears to be Nyasaland whose £5m debt incurred in the building of the protectorate’s network supposedly forced the local government to pursue a policy of labour migration that crippled the local economy.

Development was further promoted via the reduction of transport costs, the expansion of agriculture, mining and trade, and the easing of labour supply problems. Far cheaper than porterage, railways reduced the cost of transporting goods to the coast by relatively large amounts; in the Gold Coast in 1909 and 1925/6 by the equivalent of 2.1 per cent and 9.3 per cent of GDP, respectively. More importantly, they provided farmers with access to export markets, and, to a lesser extent, domestic urban/mining markets. Crops promoted include tobacco, cotton and tea in Nyasaland, grain in the Cape’s high veldt, ground nuts in Nigeria, rubber, cocoa and timber in the Gold Coast, and Kenyan wattle, initially grown as fuel for the Uganda railway and later exported for its tannin. In the east and south of the continent, however, construction disproportionately benefited European farmers. Lines were built through white agricultural areas, circumventing the African reserves, and, in Southern Rhodesia, reserves were deliberately located more than 25 miles from a line, land alongside which was set aside for Europeans. By allowing the mining companies to obtain cheaper food from further afield, railroads also often decimated local African agrarian sectors that had previously supplied the mines, and, in some areas, by extending the distribution of cheap Western imported goods, destroyed a variety of craft industries undertaken by native farmers. Although trains, by expanding markets, caused some crafts, such as bread-making, loom-weaving and pottery, to flourish.

The impact of railways on mining and trade was equally significant. Among the many mineral sectors given a boost the most significant were perhaps Rho-
As regards trade, in West Africa the railroad opened up the interior and allowed European commercial houses to move their activities inland and bypass the African traders who had previously supplied them with cash crops. In East Africa, the shift in trade involved the replacement of Arabs and Swahilis by Indian traders. Originally brought to the colony to construct the Uganda railway, these moved from the coast and set up businesses in the interior, purchasing agricultural produce and selling a vast range of Western goods.

A major problem faced by European, and, to a lesser extent, African employers was the shortage of labour. To some extent, the railways made recruitment even more difficult in that their construction and operation absorbed tens of thousands of workers. Overall, however, they had a positive impact on labour supply. Line construction prepared workers for industrial and mining employment, and the completion of lines released large numbers of head carriers for non-portering work and encouraged Africans to enter waged employment (as well as cash cropping) by allowing the distribution of cheap imported Western goods. More significantly, railways facilitated labour migration. From the start of the century, trains carried large numbers of workers to mines on the Rand and elsewhere, and, to a far lesser extent, to farms and plantations. The use of railroads ensured that labour arrived promptly and in good condition, curtailing the exhaustion and invalidity/loss of life associated with walking, and reduced the pilferage of migrants by farmers and other employers en route. It also reduced costs. The per capita expense of rail transportation was relatively low and mine owners no longer had to maintain roadside way-stations, where migrants were sheltered and fed, and had lower wage bills. Rather than recruiting locally or from a certain area, they could now import workers from distant regions where incomes were relatively low. Furthermore, the greater distance travelled by migrants reduced wastage through desertion.

Drawbacks were the configuration of the rail network, which failed to extend into economically barren regions, where the cheapest workers resided; limited railway capacity, labour being relatively bulky; and the problems of dealing with numerous railway authorities. Each train company had its own timetable and fare regimes, and, in some regions, fares were deliberately raised in order to prevent the loss of workers to employers in other regions. The poor conditions of travel also tended to lead to worker discontent, which could affect productivity. In order to reduce costs, the railway companies packed migrants into unheated and unventilated cattle trucks, known as ‘bombelas’, which lacked seats, lavatories and drinking facilities.

The urban geography of the continent and the way of life of its people were similarly transformed by the railway. The building of lines led to the decline of desian copper, Nigerian tin, South African gold and chrome, and Nigerian and Transvaal/Natal coal, the majority of which was used by the railways themselves.
old trading centres and settlements circumvented by construction; the growth of existing urban centres through which lines travelled; and the establishment of brand new towns around depots and at railway junctions and places of trans-shipment. The Uganda Railway, for instance, spurred the establishment of Nairobi, initially a rail depot, and Nakuru, situated at the junction of the Kisumu and Uganda lines, but contributed to the decline of the old caravan town of Mumias, along with Mombasa and Eldama Ravine.\textsuperscript{18} Railroads, as a form of transportation and by contributing to the decline of local agriculture, and, in South Africa, re-enforcing the capitalization of farming, also encouraged migration to urban areas and determined the geography of these towns/cities.\textsuperscript{19} In South Africa and elsewhere, trains permitted the establishment of the black dormitory townships that surrounded most conurbations – each morning bringing workers into the city and then returning them home at night. The construction of such township lines often being underwritten and the fares subsidized by the state in order to ensure apartheid.\textsuperscript{20}

Segregation, which in South and East Africa was imposed on all trains via the fares charged and colour-specific compartments, was just one of a number of ways railways changed the lives of ordinary Africans.\textsuperscript{21} Railroads facilitated the relief of famine; permitted improvements in health care, the quality of education, policing and the diffusion of information; promoted the formation of intercommunity networks; and altered the subjective view of geographical space, encouraging individuals to regard themselves as members of a region and a country rather than merely a village.\textsuperscript{22} Like all paid work, employment on the construction of lines also enabled young males to become financially independent and to marry earlier and transformed men’s family role into one of breadwinner.\textsuperscript{23} On the distaff side, the railway contributed to the spread of disease, particularly syphilis, and increased the consumption of alcohol with all its damaging consequences.\textsuperscript{24} Alcohol formed a significant proportion of the freight of most lines, and, to tackle the associated problems, the Nigerian railway authorities were forced to place a high tariff on alcoholic freight and prohibit the carriage of spirits beyond Ikirun, ensuring compliance though in-transit checks.\textsuperscript{25}

Notes


15. Pirie, 'Railways and Labour Migration'.


In 1881, when I first went to Africa, there were only 300 miles of the Cape to Cairo Railway constructed – viz., the line connecting Cape Town with Beaufort West. In 1885 it was extended to Kimberley, and here for several years its progress was arrested for political reasons into which I need not enter. But even at this early date the dream had been dreamed of continuing this iron road for thousands of miles northward, through the vast and unknown spaces of Africa.

Rhodes died in 1902, when his railway had advanced only as far as Bulawayo, 1,362 miles from Cape Town and 3,600 miles as the crow flies from Cairo.

Shortly before Rhodes died I promised him I would carry his line forward.
The expeditions I had sent up in 1899 and 1901 under the leadership of my splendid colleague, the late George Grey, brother of Viscount Grey, with the object of discovering a mineral area of sufficient importance to draw the line northwards, had already revealed the great copper wealth of Katanga, besides important gold, tin, and diamond deposits.

I will not weary you with the story of the slow advance of the line to the north. I have told it often elsewhere. Suffice to say that in 1909 it at length arrived at the Congo frontier, and that, thanks to the co-operation of King Leopold and of his great financier, Monsieur Jadot, thanks also to the consistent support of his present Majesty, King Albert, the railway has now reached Bukama, on the navigable Congo, with the result that to-day one may travel from Cape Town, by train and river steamers running in direct connection with the trains, to Stanleyville, on the north side of the Congo State – a distance of / 3,600 miles, of which 3,000 miles is railway – and to the mouth of the Congo River.

Meanwhile another transcontinental railway, traversing Africa from west to east, has been simultaneously coming into being. I refer, of course, to the Benguela Railway, which, with the co-operation of King Leopold of Belgium and of the Portuguese Government, I initiated some twenty years ago, and which, but for the interruption caused by the war, would have already been connected with the Cape to Cairo Railway. In about four years from now these railways will be connected. It will then be possible to cross Africa from Lobito Bay on the west coast to Beira or Mombasa on the east, or, at its junction with the Cape to Cairo line, to run southward to the Cape or northward towards Cairo.

Of the Cape to Cairo line there remain one or two small links to complete it and one big one. The small ones are along the Congo River, where steamers at present fill the gaps. The big link is the one between Stanleyville and El Obeid. This link will run over part of the Darfur Plateau and along the Nile Congo Divide.

It had long been my desire to arrange for the systematic investigation of the Sudanese side of this Divide in the hope that possible mineral discoveries would attract the Sudanese Railway southwards to complete this big link between the Cape and Cairo, and thus at last realize Rhodes’ dream. The opportunity at last presented itself, and during the past year an expedition under Major Christy has been at work exploring this least known of all the great African Divides. The expedition has now returned, bringing with it a vast amount of information, much of it of a most encouraging nature. There are plentiful indications of yet another heavily mineralized zone, and I am hopeful – I cannot say more at present – that the further investigations we are now undertaking may succeed in locating deposits sufficiently large and rich to justify the extension of the Sudanese Railway southwards to meet an extension of the Uganda Railway on the British side of the Divide and to link up with the northward extension now
being made from Stanleyville to the Kilo Gold-Mines on the Belgian side, and thus finally complete the railway between the two extremities of the Continent.

Those of us, therefore, who are alive ten or twelve years hence will probably witness the completion of the great trunk railway line from north to south, popularly spoken of as the Cape to Cairo Railway; and the other trunk line from Lobito Bay and Benguella on the west to Beira on the east, often termed the Benguella to Beira Railway, which, as I said, will be completed within about four years.

Now what does this portend for Africa, and not for Africa only, but for Asia, Europe, and all the world? I venture to say the completion of these railways will be followed by political and economic effects of a very far-reaching character. To begin with, on account of its extraordinary geographical situation, Africa is the pivot on which turn all our trade communications with the East and with Australasia, whether by land or sea or air. All these routes must pass along one or other of the coasts of Africa, or through Africa itself from north to south or west to east. The African Continent is, in fact, a world highway. Nature has made it so. Those are important facts, but they are small when compared with the political and economic influence upon the world of a civilized, educated, and industrialized Africa. And Africa is rapidly becoming civilized and industrialized. Less rapidly, but none the less certainly, Africa is being educated.

Livingstone said that African civilization would come through commerce and industry. This is proving to be the case. The African native is gradually being changed from a warrior to a worker. He no longer comes – as I remember he used to come – to seek work at the mines armed with assegais. He no longer has the fear of being attacked and of having to defend himself on his way to work.

My personal experience of the native of Africa has been, perhaps, as extensive as that of any man. I have had thousands of them in my employ in the various diamond, gold, and copper fields of southern and central Africa, and in the construction of the Cape to Cairo and Benguella to Beira railways. I have travelled long distances with them all over Africa, from Cairo to the Cape, and studied them at close quarters. I have discussed the future prospects of the natives with Rhodes and with some of the greatest administrators and missionaries in Africa, and have witnessed the splendid results achieved by those missionaries, especially in the teaching of useful trades, and I have been struck by the ability of the African native in acquiring those trades. One has only to study the remarkable work of the Tuskegee Institute in Alabama, founded by the late Booker Washington, a liberated slave, to learn what a high level of industrial skill the negro is capable of attaining.

The following quotation from a speech by Booker Washington at the opening of the Atlanta Exposition is most applicable to Africa. Speaking of his race, he said – and this shows a mind of high and lofty order:
‘In all things that are purely social we can be as separate as the fingers, yet one as the hand in all things essential to mutual progress

‘Nearly sixteen millions of hands will aid you in pulling the load upward, or they will pull against you the load downward. We shall constitute one-third and more of the ignorance and crime of the South, or one-third its ... intelligence and progress: we shall contribute one-third to the business and industrial prosperity of the South, or we shall prove a veritable body of death stagnating, depressing, retarding every effort to advance the body politic ... /

‘The wisest among my race understand that the agitation of questions of social equality is the extremest folly, and that progress in the enjoyment of all the privileges that will come to us must be the result of severe and constant struggle rather than of artificial forcing. No race that has anything to contribute to the markets of the world is long in any degree ostracized’,

These are the words of a liberated slave! Instead of the sixteen millions Booker Washington refers to as forming one-third of the Southern States of America, alter the words to 190 millions, and it will apply to Africa.

What then, I ask again, is to be the future of a civilized and industrialized Africa? Observe the progress already made. Sixty years ago Africa was practically an unknown Continent. Livingstone had just published the first of his journals, and was rousing the world to the horrors of the slave trade. Even in 1881, when I went to Africa as a young engineer, the slave trade was rampant in Central Africa, and cannibalism was rife up to very recently. The ‘red road to the West’ as Livingstone called it, along which we are building the Benguella Railway, was littered from end to end with bleaching skulls and bones, less than twenty-five years ago. To-day the slave trade in Central Africa is extinct. The coming of the railways has blotted out this atrocious traffic. In its place have come the civilizing influences of commerce and industry. The African has already been taught in hundreds of thousands to work instead of to fight. Thousands of them have been trained to the trade of carpenters, bricklayers, blacksmiths; others drive locomotives, work the telegraph instruments, and perform other skilled jobs. Many are entering the colleges and passing out as surveyors, architects, and medical men. In short, the African is rapidly becoming civilized. He prints and edits his own newspapers. He is beginning to realize that he is somebody and the native of a very great land called Africa. A national self-consciousness is developing as the result of the railway and other industrial developments. And all this in a short sixty years!

What about the next sixty years? Africa contains the last but also the greatest reserve of raw material for the future requirements of the whole world. It also contains a vast reservoir of the most magnificent labour. Anyone who has had any experience with the native of Africa must admit that he is magnificent human material. He has many good points and many bad. We want to develop the good and eliminate the bad. The African negro is, I affirm, naturally peace-
able, cheerful, almost always singing at his work, imitative, by no means devoid of ability, with the heart of a child, affectionate, with a keen sense of humour, and an unbounded respect for the white man of high character. The mere fact that for many years Livingstone went about scatheless, and that two of his servants voluntarily bore the body of their beloved master hundreds of miles to the coast, at great risk to their lives, to deliver it up to the white man, gives a clue to the character of the native of Africa.

These natives are a gigantic force to reckon with for good or evil. The wise or unwise handling of the millions of natives who people this continent must inevitably have a far-reaching influence on the whole world. Take, for example, the thousands of instances where the black man is capable of doing skilled work. Instead of the white man dictating to the black man what he shall be allowed to earn, as is now being done on the Rand, I would urge the white man to allow the black man to earn the full amount which his abilities and training enable him to earn. All that is possible should be done to secure the black man’s confidence in the white man’s sense of fair play and fair dealing. I foresee real danger in any other policy.

The highest status to which the black man may aspire must be limited only by his education and ability. In our future relations with the African, our aim should be to refrain as far as possible from accentuating the colour bar, but emphasize the vital importance of showing him that harmonious working between all classes and colours is the true secret of success.

Speaking for myself, I believe that the black man in Africa will, for a long time yet to come, be unequal in efficiency to the white man as a skilled workman, or in any position where he will be called upon to manage his fellow-natives. I believe he will long need the guidance of the white man in both his industrial and political development. Nevertheless he has begun to feel his feet, and to think politically.

In a few years, when the two great trunk railway lines to which I have alluded shall cut the continent longitudinally and transversely from sea to sea, Africa will come well within the range of the globe-trotting tourist, and the black man will be brought into still closer contact with the white, and will beyond doubt develop still further those political aspirations which are manifesting themselves even to-day. Already there is heard a demand for voting powers and for self-determination. ‘Africa for the African!’ is the cry. The catching phrase ‘Self-determination!’ launched during the war and offered as a panacea for most political ills, has winged its way into the recesses of Africa. Whether self-determination will always succeed remains to be seen. Self-determination carried to its logical conclusion means anarchy – each unit doing what seems right in its own eyes. As a working political principle it is only practicable if the minority in any unit area is self-disciplined enough to subordinate itself to the will of the
majority. And there seem to be races temperamentally unfit for so-called 'self-determination' by reason of their inability to abide by the principle of majority rule. We need not travel as far as Africa to witness this phenomenon. The demand for self-determination has, however, been created, has gone forth, and cannot be recalled.

What, then, should be our attitude to this coming claim for self-determination on the part of the African? I regard the position of the white man in Africa as that of a trustee for the welfare of the black. In fulfilment of this trust we must assist the African to work out his own salvation. This cannot be done rapidly, and it is doubtful whether it will follow Western democratic ideals. To be successful, democratic Government demands a high level of education, a high standard of political and municipal purity, and a greater degree of experience and self-discipline than the black man is likely to attain in many generations.

We must recognize, however, that self-government is the goal to which the more educated Africans aspire, and that it is no part of the white man's duty to repress that aspiration. That does not mean that we are to yield forthwith to any clamorous demands of a noisy minority of extremists, who are bent less on the welfare of their country than on obtaining an undesirable influence over the great uneducated masses of their countrymen, too ignorant to realize that they are merely dupes in the hands of ambitious, and often unscrupulous, agitators.

It is, unhappily, one of the defects of a democratic Government that it is so easily moved to hasty and ill-considered action by the clamorous demands of a handful of well-organized extremists. We have seen it over and over again in recent years in our own country and elsewhere. We may find the same thing occurring in Africa. Already Egypt, taught by ourselves what good government means, has now been granted the right to manage her own affairs. It remains to be seen whether this grant has been accorded as the result of a genuine demand by the whole Egyptian people, or as a concession to sectionary violence. The success or failure of this experiment will constitute a supremely valuable object-lesson in dealing with future claims for self-determination on the part of other, and perhaps less civilized, of the African peoples. We do not wish to see in Egypt any repetition of the dismal failures in self-government of Hayti, San Domingo, and Liberia. Hence the highest form of statesmanship at home will be demanded in dealing with the African during his growing political pains. We must prepare him for the difficult task of self-government by training him in the ways of law, order, and justice, of industry and commerce, gradually accustoming him to positions of responsibility, and creating in him a tradition of public service.

Our duty is to guide and not to hurry him along the road of self-development.

In the short space at my disposal I cannot do more than lay down these general principles. I feel greatly strengthened, however, in the views I have expressed by Sir Frederick Lugard's valuable treatise entitled, 'The Dual Mandate in
British Tropical Africa,' issued since you invited me to address you, and since I began to formulate my notes for that purpose. I would strongly urge everyone interested in Africa to study Sir Frederick Lugard's volume, in which, with ripe wisdom, and a wealth of knowledge gained by long experience as an administrator, the author works out in detail the problems, and indicates the lines on which the white man may co-operate with and assist the black in his upward path towards self-government.

I associate myself whole-heartedly with one piece of wise counsel given by Sir Frederick Lugard. 'Festina lente,' he says, 'is a motto which the Colonial Office will do well to remember in its dealings with Africa ... The danger of going too fast with native races is even more likely to lead to disappointment, if not to disaster, than the danger of not going fast enough. The pace can best be gauged by those who have intimate acquaintance alike with the strong points and the limitations of the native peoples and rulers with whom they have to deal.'

I endorse every word of this, and hope that the Home Authorities will definitely resolve to be guided in every decision by the opinion of the responsible white men on the spot – by those, in short, who are face to face and in daily contact with the problems to be solved.

In my personal opinion, a step that we should promptly take is towards a Federation of British Africa from the Cape to the Nile, with railway connection all the way, so as to be able to co-ordinate as far as possible one policy towards the black races, and establish some leading principles to guide us in meeting any demand by those under our tutelage for self-determination. As General Smuts said the other day, 'The white man in Africa is on his trial.' From so eminent and sagacious a statesman these words cannot go unheeded. For this reason, as well as for many others, I would gladly see a movement towards the Federation I suggest.

The world has need of Africa, and \textit{per contra} Africa has need of the world. She needs the world's markets; she also needs her own markets. The north will need the products of the south, and the south will need the products of the north.

To a steady development of her commerce and her industries we must look for the ultimate means by which she can, in Livingstone's words, 'be introduced into the body corporate of nations.' The great iron highways we are building are the arteries through which will pulse the new life to which Africa is rapidly awakening. They will be a great asset not only to Africa herself, but through the development of Africa to the whole world.

Sixty years ago the influence of Africa beyond her own borders was nil. What will her influence be at the end of the present century? It is conceivable that you may have a United States of Africa under \textit{one} flag or, possibly groups of States under different flags, united in general commercial policy, and protected by a Monroe doctrine. This is no wild dream.
I ask you therefore to project your vision into the not-too-distant future and think out for yourselves the nature of the political influence in the councils of the world of an Africa composed of Federated States, an Africa seamed with railroads, an Africa in which vast industries have been established, and in which both white and black men are co-operatively interested, an Africa upon whose resources and whose labour the whole world in large measure depends.

I ask you to consider all these possibilities – I might even say probabilities – in view of the boundless natural wealth of the Continent, in view of Africa’s geographical position athwart the highways to the Far East and to Australasia, and last, but not least, in view of her immense, prolific, and readily civilizable population. Having regard to all these elements of greatness, I ask you how otherwise are we to deal with the problems of African development than in the sense that I have indicated?

The Chairman: Sir Reginald Wingate, I am sorry to say, has been unable to be present to-day; but he had the advantage of seeing an advance copy of Mr. Williams’ lecture, and he sent some notes to Colonel Yate, the Honorary Secretary, who will now read them.

Lieut.- Colonel A.C. Yate then read extracts from the following notes sent by General Sir Reginald Wingate, G.C.B. 10

I much regret that I am prevented from leaving Scotland in order to attend the lecture of Mr. Robert Williams, of which I have seen an advance copy – and take a personal part in the discussion. I shall be grateful, therefore, if you would read out any extracts from the enclosed notes you think desirable in the circumstances. I recognize with the lecturer that as Africa received its first civilizing influences from Asia, so will future developments in Africa tend to bring these two great continents still more closely in touch with one another, especially when the great deserts and vast unknown spaces come to be bridged over for thousands of miles by that great iron road which is the theme of the lecturer, and I am sure all will have listened with absorbing interest to what he has to say.

From the material facts which Mr. Williams has placed before us, and from the large and wide views to which he has given such lucid expression, he has furnished us with food for thought in a variety of directions; but to me two points especially emerge:

Firstly, the modesty of the lecturer, who is so largely responsible for the wonderful transformation in the African continent during the last forty years.

Secondly, the vital importance of bringing home to the British / public, through such a lecture, the immense possibilities of Africa in the scheme of world development which Mr. Williams has so concisely summarized in its concluding paragraph.

[...]
An American journalist – Mr. Marcosson, who recently travelled in Central Africa – pays a tribute to Mr. Williams’ work which I cannot refrain from quoting. In his third letter to *The Times*, entitled ‘Wonders of the Congo’, he writes:

‘*British Enterprise.* – I entered the Congo at Sakania, which is on the border of Northern Rhodesia. It is the outpost of the Katanga, the most prosperous province of the colony. The Katanga is one huge mine, principally copper. The pioneer of Katanga exploitation was an Englishman, Robert Williams, the moving spirit in the construction of the Benguela Railway from Lobito Bay (Portuguese Angola) to the Katanga. Late in the nineties he sent George Grey, brother of Sir Edward, now Viscount, Grey, to the Katanga region on a prospecting expedition. There he discovered large deposits of copper, and also tin, lead, iron, coal, platinum, and diamonds. Williams organized the Tanganyika Concessions, which became the instigator of Congo copper-mining. Subsequently, the Union Minière du Haut Congo was formed by leading Belgian colonial capitalists, and the Tanganyika Concessions acquired more than 40 per cent. of its capital. The Union Minière took over all the concessions and discoveries of the British corporation. Within ten years it has grown from a small / prospecting outfit in the wilderness, 250 miles from a railway, to an industry employing at the time of my visit more than 1,000 white men and 15,000 blacks, with four completely equipped mines which produced nearly 30,000 tons of copper in 1917, and a smelter with an annual capacity of 40,000 tons of copper. A concentrator capable of handling 4,000 tons of ore per day is nearing completion’.

With regard to my second point, the importance of bringing home to our people the immense possibilities of Africa in the scheme of world development, it is no easy matter for me to add one word to the admirable record and the sound advice on this subject given by the lecturer, but what specially appeals to me – and I think it must appeal to all interested in empire development – is the immense future opened out by the completion of the Benguela Railway and the final linking up of the Congo railway system with that of the Sudan – thus forging the last link in the dream of that great empire-builder Cecil Rhodes and his able lieutenant Robert Williams, who has so faithfully carried out his promise to his dying chief to ‘carry his line forward’. As he truly says, if we are still alive ten or twelve years hence, we should see the completion of this vast project and the progress in African development which it implies.

Although the period covered by our lecturer extends to forty years back, I would ask you to retrace with me the salient points of the last twenty-five years only – for they are curiously interesting. Mr. Williams points out that the Katanga discoveries at the close of the last century formed another of those ‘milestones’ of mineral deposits whereby the Cape to Cairo Railway would be advanced. Situated on the watershed of the Zambesi and Congo, the Katanga province of the Southern Belgian Congo is the greatest mineralized copper-belt
known to the world. Slowly but surely the great iron spine advanced from the south, and though it took ten years to reach the Congo border, it arrived, in spite of every sort of difficulty and obstacle, financial and other. Simultaneously with this northward advance the Katanga copper-mines also caused Mr. Williams to initiate that other great transcontinental railway scheme from west to east – from Lobito Bay in Portuguese Angola – to connect up with the Cape to Cairo line at Katanga. It was clear that trade must follow the shortest route to the sea.*

The completion of the Benguella line will mean a saving of close on 3,000 miles of transport, and provided the financial difficulties, which are in a fair way of being solved, are finally overcome, it is expected the railway connection between the Atlantic Ocean and the Indian Ocean will be achieved within four years. This railway has been truly called the ‘master key’ of Africa, and I think the term must have been coined by the Germans, for it will be remembered how keenly anxious they were to secure the concession, and how bitterly annoyed they were to find that Robert Williams had forestalled them.

I believe it is now generally admitted that when the main trunk line from north to south is completed, the feeders east and west will follow; but, as we have seen, many of these feeders are already made, or approaching completion. The great gap between the two terminals of the trunk line, Stanleyville and El Obeid, is something like 1,750 miles out of a total of 4,500 miles.

Mr. Williams has made a most important proposal as to how this gap is to be bridged, and I think he is probably right in urging that the prime need is now to extend the railway from the northern terminal further south, though, in all probability, once the route is finally decided upon, work from the south northwards will advance as well.

It is a curious coincidence that with the great activity in pushing the railway northwards, consequent on the Katanga discoveries, a similar activity, but arising from entirely different causes, resulted in pushing the railway southwards into the Sudan almost at the same moment. This is neither the time nor the occasion to describe the development of the Sudan railway system; suffice it to say that within the last twenty-five years the following railway construction has been completed:–

* On this point Sir Frederick Lugard, in his last publication, ‘The Dual Mandate in British Tropical Africa,’ is insistent. At p. 464, footnote 1, he writes: ‘The Cape to Cairo Railway can only be justified in so far as each section has a definite objective which offers reasonable prospects of being remunerative. Railways in Africa must lead by the shortest route to the seaport, and not along its length.’ This statement must be modified by an opinion which I heard expressed by Sir Reginald Wingate a month before this lecture, and by Sir Edgar Bonham-Carter at the lecture – viz., that if grave danger threatened the British Empire in Egypt, or the Sudan, or the Suez Canal, or any where in that quarter, the Cape to Cairo Railway was a channel by which the Overseas Dominions could move forces to the aid of the mother-country. – A. C. Y.
The Wadi-Halfa-Khartoum line, with bridges over the Atbara and Blue Nile (579 miles).

The Khartoum-El Obeid line, with a bridge over the White Nile (428 miles).

The Atbara Junction-Port Sudan line, with a branch to Suakin (305 miles).

The Abu-Hamed-Kareima branch (145 miles).

Thus El Obeid is in direct railway communication (just over 900 miles) with an excellent and up-to-date port on the Red Sea.

Clearly this situation has long been thoroughly grasped by Mr. Williams, and, true to his instinct, he has sought Nature's help to guide him in his selection of the various routes between El Obeid on the north and Stanleyville on the south, where best the gap can be bridged over, and the final link forged of the great north to south chain.

He has sought, and I think he must have found, that missing 'milestone' in the Great Congo Nile Divide to which he refers. Is there not some connection between what he has told us regarding Major Christy’s expedition and the following telegram, which appeared in *The Times* of the 23rd instant, in a message dated Cairo, March 22?

‘An extensive mineralized area has been discovered by prospectors of the Congo-Nile Syndicate, which belongs to the Tanganyika Concessions Group. The discovery is described as of alluvial gold, which is said to have been traced in several rivers. What is believed to be the source of the gold has also been discovered in the form of an auriferous belt of rocks extending several miles. An old working carrying copper and gold has also been discovered, with evidence of an ancient copper-smelting industry in the vicinity’.

If this discovery prove to be the mineralized ‘milestone’ which, magnet-like, is to draw the railway there, then it is clearly somewhere on the great Congo-Nile Divide, and it will imply that – as Mr. Williams says in his lecture – ‘the unfinished link lies between Stanleyville and El Obeid, and that the line will run over part of the Darfur Plateau and along the Nile-Congo Divide’.

It is, of course, possible that subsidiary lines may connect Stanleyville with Rejaf, following the present motor-road connecting the important Belgian gold-mining area at Kilo with the Nile in that vicinity – thus turning the Rapids and Dufilé, and providing a trade route along the navigable Nile waterway to Khartoum, or to the nearest point on the Sudan railway system at Kosti. But should the recent mineral discoveries prove sufficiently large and rich to justify the extension of the Sudan Railway southwards, there is little doubt that the route to be followed will be as Mr. Williams describes; and clearly, through his prescience and indomitable perseverance, the wonderful dream of his great chief, Cecil Rhodes, is far nearer completion than any of us had contemplated.

If a quarter of a century has seen such progress in the once savage Sudan – where in that short space of time the revenue has risen from eight thousand
pounds in 1900 to five million pounds in 1920, and the trade to close on twelve million pounds – and if the British Government has such faith in its cotton-growing possibilities as to guarantee a loan of several million pounds for its development, shall we question the accuracy of Mr. Williams' forecast, that in the not remote future we may have an Africa composed of federated States, seamed with railroads, where vast industries have been established and upon whose resources and labour the whole world may in a large measure depend?

How is this great result being achieved? Surely it is in the main due to that great iron spine which is now nearing completion, with its many arteries and vertebrae already stretching east and west to the two oceans washing the shores of Africa. This marvellous achievement is represented by the Cape-Zambesi express, the Rhodesia-Katanga extension, the Congo-Nile steamer, rail, and motor routes, the Sudan / steamer and railway services, the connection of Stanleyville with El Obeid – in all, a distance of nearly 7,000 miles. Then, forming a sort of cross with the north and south routes, the great transcontinental east to west connection is extending from Lobito Bay to Beira, with eventual through connections via Tanganyika to Dar es Salaam and with the Uganda Railway to Mombasa.

All honour, then, to the great men who have spent their lives and their energies – some, alas! have not lived to participate in the success of their undertakings – and all honour especially to Robert Williams, who, practically single-handed, has built up an organization for the development and transportation to the markets of the world of the rich treasures his vivid imagination has discovered for us in those great mineralized 'milestones' which mark the various stages in the progress of African railways.

The Chairman: I believe Sir Frederick Lugard is present this evening. We should be very grateful if he would favour us with any observations. (Applause.)

Right Hon. Sir Frederick Lugard, P.C., G.C.M.G.: My Lord, Ladies and Gentlemen, — [...]

We recognize to-day how important and essential a part railways play in the rapid material development of a country like Africa, whose exports consist solely of foodstuffs and raw materials, but perhaps their civilizing and educational value has hardly been equally appreciated. Mr. Williams has told us how at first the labourers employed in construction works come with their bows and arrows and spears, and how before long these are discarded. Wild, primitive savages learn to value the regular pay, which enables them to purchase in the camp market the little luxuries of cloth, tobacco, and meat. Volunteers come forward more eagerly, soon they learn to appreciate piecework, and gradually become more skilled. The railway workshop is the most potent institution in Africa for the spread of technical education, and the railway in its various departments offers hundreds, and even thousands, of openings to the youth of the Government
and Mission / schools as clerks, signallers, telegraphists, guards, stationmasters, storekeepers and accountants, etc.

Though I cannot rival Mr. Williams’ forty-one years of African work, my own experience of Africa is sufficiently long and varied to justify me in expressing a hearty concurrence in all that he has said regarding the character of the negro tribes and the incalculable importance of securing their confidence in the justice and fair play of Europeans. I endorse most heartily his view both of the ability of the African and of the limitations which for many a generation preclude the possibility of his being able to stand alone in industrial and political development. The striking quotation which Mr. Williams made from the writings of Booker Washington seems to echo and confirm the views I recently expressed concerning the Colour Question in the Edinburgh, and since the President of the United States did me the honour to quote them and to assert that they presented the true solution of the problem, I may ask your indulgence if I repeat them: ‘Here, then, is the true conception of the inter-relation of colour: complete uniformity in ideals, absolute equality in the paths of knowledge and culture, equal opportunity for those who strive, equal admiration for those who achieve; in matters social and racial a separate path, each pursuing his own inherited traditions, preserving his own race purity and race pride; equality in things spiritual, agreed divergence in the physical and material’. This, too, as I gather from his lecture, is the view held by Mr. Williams. I would, however, like to alter one word in his description of the new spirit which is beginning to show itself among the natives of Africa. It is, I think, rather a racial than a national self-consciousness, and its exponents advocate the prerogatives of race rather than those of tribal affinities.

Mr. Williams has not told us quite as much as I, at any rate, should have liked to hear about the more recent progress and the programme for the immediate future of the Cape to Cairo and the Benguella-Beira railways. I must confess that the latter interests me more than the former, for its object is to open up a fertile plateau abounding in vegetable products, to tap the wonderful mineral deposits of the Katanga district, and to provide a means of conveying them to the nearest seaport by the shortest and cheapest means. Of this great railway Mr. Williams was the originator and constructor. The story of its inception and the difficulties encountered by international rivalries is one of extraordinary interest. In the far future, when Africa becomes civilized and industrialized, internal railways as in Europe will, no doubt, become important and remunerative means of transport, conveying the products and manufactures of one region to another. Or, again, if another Great War should break out (which God forbid), it is impossible to forecast the rôle which railways in Africa, especially those which cross the continent from west to east, / may play; but to-day the great need of Africa is for railways leading from the centre to the seaports, and she has little need of a longitudinal north to south railway. Mr. Williams forecasts an extension of
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the Sudanese railways southwards from El Obeid to connect with the line from Stanleyville. It is possible that from the same point a line may some day extend to the Nigerian system at Lake Chad, and, as the ‘Niger to the Nile’, may add one more to the alliterations (Cape to Cairo and Benguela to Beira) which seem to exercise a fascination for the financier.

Sir Edgar Bonham-Carter, K.C.M.G. 11: [...] Dealing with the question of the railway, I have only a few remarks to make. Of course, to those of us who have lived and worked in the Sudan, it is a matter of the very greatest interest. The first object of those who were responsible for railway policy in the Sudan was to provide railway communication between the interior and the Red Sea, this being the shortest and cheapest route for the export and import of goods. This was accomplished by the opening in 1905 of the railway connecting the Halfa-Khartoum Railway with Port Sudan and Suakin. Subsequently the extension of the railway from Khartoum southwards was begun, and, as Mr. Williams stated, in 1912 Lord Kitchener opened the Khartoum-El Obeid Railway. El Obeid is distant about 430 miles from Khartoum by railway, about 1,000 miles by railway from Wadi-Halfa, and about 2,000 miles by railway and river from Alexandria. I need hardly mention that there is not yet complete through railway communication between Egypt and the Sudan: for there is still a break in the railway of about 200 miles between Wadi-Halfa and Aswan, along which one has to travel by river-steamer.

It is not without interest that the White Nile is navigable by river-steamer for a thousand miles south of Khartoum as far as Gondokoro. At one time it seemed likely that, as a preliminary stage in the construction of the Cape to Cairo Railway, the railway would be carried from the south as far as Gondokoro, or to some other point on the upper White Nile, where it would for the time being stop, and transport between that point and Khartoum would be carried on by river steamer. It is interesting, therefore, to hear from Mr. Williams that it is now proposed that the Cape to Cairo Railway shall join the existing Sudan railway system at El Obeid, and that only about 1,700 miles remain to be completed. The amount remaining to be completed is, therefore, a small amount compared with what has already been built.

I will conclude my remarks with a few observations on the utility of the Cape to Cairo Railway, considered from the point of view of the Sudan. In the first place, it is obvious that, strategically, the railway will be of the very greatest importance. In the case of any disturbance in, or foreign aggression to, any British territory through which it passes, it will enable troops to be brought rapidly and easily from South Africa and the other territories which it traverses to the point in danger. Secondly, the railway will be of the highest value in facilitating the internal administration of the Sudan. There are places in the southern parts
of the Sudan to reach which from Khartoum at present necessitates a journey of from a month to six weeks. The railway will enable the same journey to places through which it passes to be completed in not many more hours than the number of days now required. Thirdly, as regards the commercial point of view, I believe that it will be found that there is no great physical difficulty in the making of the railway when it gets into Sudan territory. It will, therefore, be cheaply constructed, and experience in the Sudan has been that, where you can make a railway cheaply, it is extraordinary how soon it will pay its way, even though the population through which it passes may be uncivilized and scanty. In this connection, it is relevant to point out that hitherto the Sudan has been developed, one may say, in a topsy-turvy way. For the northern part of the Sudan, which, because it is closer to the means of communication, has been developed first, is the more desert part. While in the north the Sudan is almost rainless, and vegetation is, generally speaking, confined to a narrow strip along the Nile, the rain increases as one travels south, until on the southern border there is an average rainfall of 40 inches a year, and the whole country is under vegetation. The completion of the Cape to Cairo Railway through Sudan territory will enable the development of the southern portions of the Sudan, which, from a commercial point of view, have hitherto been neglected, to be gradually taken in hand.

Mr. Chairman, I will conclude by again thanking Mr. Williams for his extremely interesting lecture. (Applause.)

Sir Lee Stack\textsuperscript{12} (Governor-General of the Sudan): Mr. Chairman, Ladies and Gentlemen, – I have only landed from the Sudan in the last few days, and came here to listen, not to speak, but I would like to say how much I appreciate the opportunity of hearing Mr. Williams’ lecture, in which he has developed his theory and practice of the route from the Cape to Cairo, and the transverse route from Benguella to Beira. It is interesting to me, because one of the big links, or the big link, is through the Sudan. The Sudan is as yet a poorish country, and we have not been able to develop our communications as fast as we would like to have done; but if the indications of mineral wealth which Mr. Williams has told you about in the Southern Sudan materialize, then the inducement for a railway south-westward from El Obeid is a very great one, and a further stage in bridging that / gap will no doubt be feasible. I also would like to associate myself with Mr. Williams’ sentiment as regards the trusteeship the white man holds towards the black man in Africa. If we develop our possessions in the interests of the native, and not by exploiting him in the interests of ourselves, then I am sure our administration will be successful. You have heard a good deal about the Sudan from Sir Reginald Wingate and Sir Edgar Bonham – Carter, so I will not say anything more about it; but I should like to thank Mr. Robert Williams for his lecture and express the great interest it has been to me.
Mr. Donald Mellor, F.R.G.S.: Mr. Chairman, – I must say I thank Mr. Williams for the lecture. I know what a splendid help he was to the late Cecil Rhodes, and I only hope that the railway will be constructed directly as shown according to the map on the wall. If so, I think it will be a splendid monument to Mr. Williams’ courage, determination, and tact. From what I have read, I know that he has had unforeseen difficulties to face, and that no man who had not got what I may call a bulldog determination to carry on the work that Cecil Rhodes inaugurated could possibly have achieved the work that he has done up to the present time. When Colonel Lugard spoke, he expressed the wish that Mr. Williams might have mentioned more about the railway line. I should have liked to hear more also, because I believe, as regards the Benguella Railway, there have been a great many difficulties. Respecting the pushing forward of this line to the border and its continuation, it all depends upon the Belgian extension from their border to the Katanga district through Lulua. The success of the Benguella line depends on that. If this extension is not made the rest of the railway is no good for the chief purpose for which it has been built. I understand that there are several other schemes that have been broached lately for a line in the Belgian Congo across country for about 900 kilometres, which apparently is an offset against the Benguella line. As regards the line from Stanleyville, as laid down on the map, there have been several schemes for lines from this place in the direction of Lake Albert. I understand that one (the southern route) has been practically dropped, and that another scheme taking a more northerly route, making connection with the Nile (north of Lake Albert), which one of the last speakers mentioned, will replace it. Mr. Williams did not say anything about this; I hope he will not mind my mentioning it. I have worked out an itinerary from Stanleyville to Capetown. It is possible to travel from Stanleyville in accordance with a properly printed timetable to Capetown in twenty-six days, and from Capetown to Stanleyville in about twenty days, because one saves time when going down the river. I greatly appreciate Mr. Williams’ lecture, and I should like to thank him for it. (Applause.) / [...]

**COLONIAL RAILWAYS 1929–1938:**
**AN ECONOMIC REVIEW**

**BY**

JOHN WYATT SPILLER,¹ C.M.G., M. Inst. C.E.

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1941.

[...]
Railway Working Results, 1929–1938.

Nigerian Railway.

The revenue statistics of the Nigerian railway for the 10-year period 1929–1938 are given in Table VII. For purposes of comparison, indexes of the sterling value of world trade and of the foreign trade (imports plus domestic exports) of Nigeria are included.

Table VII.

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<th>1929</th>
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<td>45</td>
<td>62</td>
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<td>90</td>
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<td>48</td>
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<td>Railway coaching receipts</td>
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<td>88</td>
<td>63</td>
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<td>61</td>
<td>58</td>
<td>66</td>
<td>77</td>
<td>81</td>
</tr>
<tr>
<td>Railway goods receipts</td>
<td>£2,220,754</td>
<td>100</td>
<td>79</td>
<td>70</td>
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<td>71</td>
<td>77</td>
<td>74</td>
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<tr>
<td>Railway gross receipts</td>
<td>£2,692,661</td>
<td>100</td>
<td>80</td>
<td>68</td>
<td>69</td>
<td>69</td>
<td>75</td>
<td>72</td>
<td>99</td>
<td>105</td>
</tr>
<tr>
<td>Railway net receipts*</td>
<td>£1,355,242</td>
<td>100</td>
<td>62</td>
<td>50</td>
<td>58</td>
<td>59</td>
<td>71</td>
<td>67</td>
<td>111</td>
<td>111</td>
</tr>
</tbody>
</table>

There was a 9-per-cent. extension of mileage of open lines during the decade, and this should have produced some additional revenue quite apart from changes in industrial conditions. The indexes show that at the bottom of the world slump Nigeria’s foreign trade fell to lower levels proportionately than world trade, but subsequently recovered to a greater extent, the 1937 figure for Nigeria being 10 per cent. above whilst world trade was still 23 per cent, below the 1929 level. Between the middle of 1937 and the middle of 1938 there was a recession in world trade, and Nigeria appears to have suffered from this recession to a remarkable extent, as the value of foreign trade in 1938 was but little more than half its value in 1937. It is difficult to explain, so great a reduction in so short a period, but it would certainly appear that Nigeria’s prosperity is particularly vulnerable to external influence.

During the slump railway revenue did not fall to quite such relatively low levels as foreign trade, and by 1937 goods, gross, and net receipts were all higher

* Before providing for renewals.

– 332 –
than in 1929. Coaching receipts did not show a similar recovery, but the reason for this will be discussed later. If 1937 be compared with 1929, it will be seen that Nigeria’s foreign trade increased by 10 per cent., the railway mileage by 9 per cent., and the gross railway receipts by 5 per cent. Doubtless the development of alternative forms of transport affected railway receipts to some extent, but a more important reason why the railway did not benefit more from increased trade was the reduction in rates. It should be noted that coaching receipts are small in comparison with goods receipts; in 1937 they amounted to only 11½ per cent. of the gross receipts.

In the early years of the depression the net revenue fell more rapidly than the gross revenue; this is the common experience of all railways, as a time-lag usually occurs between a reduction of traffic and a corresponding reduction in working expenses. Moreover some part of railway expenditure is not affected by the volume of traffic.

In Table VIII the goods traffic on the railway has been separated into export, import and internal traffic. The export and import figures are the tonnages dealt with at the ocean ports, and the internal traffic has been calculated by subtracting the export and import tonnages from the total paying tonnage. The figures are exclusive of coal.

<table>
<thead>
<tr>
<th>Year</th>
<th>Export</th>
<th>Import</th>
<th>Internal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>310</td>
<td>190</td>
<td>219</td>
<td>719</td>
</tr>
<tr>
<td>1930</td>
<td>274</td>
<td>153</td>
<td>156</td>
<td>583</td>
</tr>
<tr>
<td>1931</td>
<td>251</td>
<td>68</td>
<td>213</td>
<td>532</td>
</tr>
<tr>
<td>1932</td>
<td>320</td>
<td>73</td>
<td>146</td>
<td>539</td>
</tr>
<tr>
<td>1933</td>
<td>310</td>
<td>72</td>
<td>143</td>
<td>525</td>
</tr>
<tr>
<td>1934</td>
<td>342</td>
<td>71</td>
<td>139</td>
<td>552</td>
</tr>
<tr>
<td>1935</td>
<td>316</td>
<td>88</td>
<td>187</td>
<td>591</td>
</tr>
<tr>
<td>1936</td>
<td>434</td>
<td>110</td>
<td>223</td>
<td>767</td>
</tr>
<tr>
<td>1937</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1938</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Whilst during the depression import traffic fell to one-third, and internal traffic to two-thirds, of the tonnages in 1929, export tonnage suffered no similar reduction, and in fact the volume increased in 1932 and the later years of the decade. Export and import traffics were completely out of balance with respect to volume, but there was no similar disparity between their values. The increase in the export tonnage was mainly due to the marketing of greater quantities of ground nuts, a commodity of low value. Further, the serious decline in the price-level of tropical commodities during the slump reduced the export values, even though the volume was maintained. It was the fall in commodity prices which
was responsible for the reduction in imports and, by reducing the wealth of the country and the amount of money in circulation, caused a diminution of internal trade and traffic.

*Passenger Traffic.* – In Table IX the passenger statistics for 1937 are compared with those for 1929.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of passengers</th>
<th>Passenger receipts</th>
<th>Number of Passenger miles</th>
<th>Average fare paid per mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>3,851,060</td>
<td>£325,894</td>
<td>157,893,460</td>
<td>0.495d.</td>
</tr>
<tr>
<td>1937</td>
<td>7,356,764</td>
<td>£279,717</td>
<td>223,903,343</td>
<td>0.300d.</td>
</tr>
</tbody>
</table>

Percentage-change, 1929 to 1937  
-91  -14  +42  -37

Although during the 10-year period coaching receipts never recovered to the 1929 level, this was entirely due to the reduction in fares. Comparing the two peak years 1929 and 1937, the number of first-class passengers was nearly 50 per cent. lower, and the number of third-class passengers nearly 100 per cent. higher in the latter year. The numbers of second-class passengers were approximately equal in the two years. Of the passengers using the railway 99 per cent. travel third class, and the reduction in coaching receipts was due mainly to a reduction in the third-class fare from ½d. to ¼d. per mile. The cheaper fare enabled the railway to retain its passenger traffic in competition with road motors, but did not increase its revenue.

*Goods Traffic.* – In Table X the goods statistics for 1937 are compared with those for 1929.

<table>
<thead>
<tr>
<th>Year</th>
<th>Paying tonnage hauled</th>
<th>Goods receipts</th>
<th>Average length of haul: miles</th>
<th>Net ton-mileage, paying</th>
<th>Average rate per ton-mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>929,608</td>
<td>£2,220,154</td>
<td>283</td>
<td>263,497,909</td>
<td>2.02d.</td>
</tr>
<tr>
<td>1937</td>
<td>881,976</td>
<td>£2,406,654</td>
<td>383</td>
<td>337,594,117</td>
<td>1.71d.</td>
</tr>
</tbody>
</table>

Percentage-change, 1929 to 1937  
-5  +8  +35  +28  -16

During the years of depression goods receipts never fell below 70 per cent. of the 1929 level, whereas the value of Nigeria’s foreign trade fell to less than half of its value in 1929. Goods traffic is mainly dependent upon foreign trade, and the
The difference between the indexes for foreign trade and goods receipts is due to the fact that, although goods rates may have been reduced, commodity prices fell to a greater extent, with a corresponding reduction in values.

The tonnages of some of the more important commodities carried by rail during the 10 years are shown in Table XI. During the depression coal and cotton fell to less than one-half and tin-concentrates to one-third of the 1929 level, but the other commodities included in the Table did not fall to anything like the same extent. This is in accordance with general experience, as in most countries foodstuffs are affected less than raw materials by changes in industrial activity; they rise less during booms and fall less during slumps. Ground nuts and Kola nuts increased to a remarkable extent during the decade, and even in the worst years of depression; 1932, 1933, and 1934 exceeded the tonnages carried in 1929. Between 1929 and 1937 the world production of ground nuts increased by 42 per cent; but as, in the latter year, the railway transported 64 per cent. more than in 1929, it would appear that production in Nigeria increased considerably more than the world average.

Ground nuts are such an important factor in the railway economy that they deserve more than passing attention. As they are planted yearly by native farmers, production is capable of rapid expansion when the price is attractive. The length of haul to the coast is, however, considerable, and when world prices are low the cost of inland and ocean transport leaves little margin for profit to producers. In the two crop seasons 1936–1937 and 1937–1938 the price at Kano varied between limits of £9 and £3 per ton, and so great a difference must have proved a disturbing element to the growers. The tonnages conveyed in recent years, and the railway revenue therefrom, were as follows:—

<table>
<thead>
<tr>
<th>Tonnage</th>
<th>Railway revenue.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1935–1936</td>
<td>164,441</td>
</tr>
<tr>
<td>1936–1937</td>
<td>285,445</td>
</tr>
<tr>
<td>1937–1938</td>
<td>257,145</td>
</tr>
<tr>
<td>1938–1939</td>
<td>177,347</td>
</tr>
</tbody>
</table>
### Table XI. – Commodities Railed: Tons.

<table>
<thead>
<tr>
<th>Year</th>
<th>Coal (Tons)</th>
<th>Cocoa (Tons)</th>
<th>Cotton (Tons)</th>
<th>Ground Nuts (Tons)</th>
<th>Kola Nuts (Tons)</th>
<th>Palm Nuts (Tons)</th>
<th>Tin Concentrates (Tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920</td>
<td>210,310</td>
<td>30,636</td>
<td>21,383</td>
<td>156,932</td>
<td>10,682</td>
<td>88,373</td>
<td>15,341</td>
</tr>
<tr>
<td>1930</td>
<td>178,802</td>
<td>18,151</td>
<td>18,969</td>
<td>131,586</td>
<td>11,792</td>
<td>88,659</td>
<td>11,080</td>
</tr>
<tr>
<td>1931</td>
<td>135,124</td>
<td>18,031</td>
<td>6,174</td>
<td>157,882</td>
<td>12,291</td>
<td>77,843</td>
<td>9,391</td>
</tr>
<tr>
<td>1932</td>
<td>107,132</td>
<td>26,945</td>
<td>10,019</td>
<td>198,032</td>
<td>12,686</td>
<td>90,754</td>
<td>5,120</td>
</tr>
<tr>
<td>1933</td>
<td>102,347</td>
<td>27,252</td>
<td>11,726</td>
<td>205,965</td>
<td>12,925</td>
<td>79,535</td>
<td>5,314</td>
</tr>
<tr>
<td>1934</td>
<td>108,233</td>
<td>29,585</td>
<td>25,028</td>
<td>219,874</td>
<td>18,530</td>
<td>78,302</td>
<td>7,742</td>
</tr>
<tr>
<td>1935</td>
<td>118,583</td>
<td>35,398</td>
<td>42,515</td>
<td>164,441</td>
<td>17,158</td>
<td>105,201</td>
<td>10,680</td>
</tr>
<tr>
<td>1936</td>
<td>124,929</td>
<td>27,865</td>
<td>27,525</td>
<td>285,444</td>
<td>16,661</td>
<td>116,911</td>
<td>13,576</td>
</tr>
<tr>
<td>1937</td>
<td>141,249</td>
<td>33,533</td>
<td>23,022</td>
<td>257,145</td>
<td>24,115</td>
<td>90,143</td>
<td>14,681</td>
</tr>
<tr>
<td>1938</td>
<td>135,115</td>
<td>42,944</td>
<td>16,287</td>
<td>177,347</td>
<td>19,562</td>
<td>74,376</td>
<td>8,340</td>
</tr>
</tbody>
</table>
The average cost of rail transport to the coast was about £3 17s. per ton, and the ocean freight charge to Europe was probably not less than £1 7s. per ton. Further transport costs for bagging, loading and discharging, etc., would amount to at least 7s. per ton, so that the total cost of transport from loading-station to a British port would not be less than £5 10s. per ton. In addition, the farmer has to deliver to the railway, and expenses for marketing, middleman's profits, etc., have to be paid. Altogether the total cost of marketing – as distinct from growing – is likely to average £6 10s. a ton, and the difference between this figure and the world market price is what the grower receives. The cost of marketing and transport varies between narrow limits only, but the world market price, which is governed largely by the law of supply and demand, varies widely, and the producer may or may not receive a price that is profitable. The percentages of gross goods receipts attributable to ground-nut traffic during recent years were as follows:—

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1934</td>
<td>50</td>
</tr>
<tr>
<td>1935</td>
<td>38</td>
</tr>
<tr>
<td>1936</td>
<td>47</td>
</tr>
<tr>
<td>1937</td>
<td>42</td>
</tr>
<tr>
<td>1938</td>
<td>39</td>
</tr>
</tbody>
</table>

These figures indicate the extent to which the railway is dependent upon a single commodity, and it is probably true to state that the price of ground-nuts is the largest single factor affecting the prosperity of the railway.

The principal operating results for the two peak years are tabulated below:—

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross railway receipts.</td>
<td>£2,692,661</td>
<td>£2,834,967</td>
<td>+5</td>
</tr>
<tr>
<td>Working expenditure.</td>
<td>£1,337,419</td>
<td>£1,326,955</td>
<td>-1</td>
</tr>
<tr>
<td>Surplus of receipts over expenditure.</td>
<td>£1,355,242</td>
<td>£1,508,012</td>
<td>+11</td>
</tr>
<tr>
<td>Passengers carried.</td>
<td>3,851,060</td>
<td>7,356,766</td>
<td>+91</td>
</tr>
<tr>
<td>Fare, third-class, per mile.</td>
<td>½d.</td>
<td>¾d.</td>
<td>-50</td>
</tr>
<tr>
<td>Paying ton-mileage.</td>
<td>263,497,909</td>
<td>337,594,117</td>
<td>+28</td>
</tr>
<tr>
<td>Average rate paid per ton-mile.</td>
<td>2.02d.</td>
<td>1.71d.</td>
<td>-16</td>
</tr>
</tbody>
</table>

Although the work done by the railway in 1937, due to a 91-per-cent. increase in the number of passengers and a 28-per-cent. increase in goods ton-miles, was so much greater than in 1929, railway receipts – in consequence of reduced fares and rates – advanced by only 5 per cent., whilst working expenditure was actually lower.

The year 1937 was the most prosperous in the railway’s history, in spite of a considerable reduction in passenger fares and goods rates since the previous best year (1929); but there had been a number of lean years between, and not until 1936 had railway receipts showed any marked recovery from the slump. In 1937 gross receipts were sufficient to cover working expenses and interest on
capital expenditure, to contribute £427,547 to the renewals fund, and to leave a
net surplus of £231,286 available for reserve.

In order to cover interest charges on capital and enable an adequate contribu-
tion to be made to the renewals fund, about £1,200,000 is needed yearly from
the net receipts, that is, about 90 per cent. of the net receipts in 1929. Table VII
shows that in the 10 years 1929 to 1938 the net receipts averaged only about 75
per cent. of their 1928 value. The average shortage was 15 per cent., or a total
of about £1,800,000 over the 10-year period, which, however, included several
years of exceptionally depressed conditions in world trade and industry which it
may be reasonable to hope may not occur again.

Gold Coast Railway.
The working results of the Gold Coast railway for the 10-year period 1929–
1938 are shown in Table XII.

During part of 1937 the native farmers refused to market their cocoa, as they
considered that the price offered was not adequate. Consequently, there was a
hold-up of cocoa traffic, and it is estimated that 106,000 tons of cocoa which,
in normal circumstances, would have been transported to the coast during the
1937 financial year, was not put on rail until 1938. The value of this traffic was
probably not less than £250,000, and but for the temporary hold-up the goods
receipts for 1937 would have been increased and those for 1938 reduced by this
amount. Moreover, railway receipts were affected in other ways by the cocoa hold-
up, as general trading practically ceased in the areas concerned, and this caused a
reduction in passenger travel and in the movement of imported commodities. It
is not easy to assess the modification necessary to enable the railway revenues of
1937 and 1938 to be adjusted to cover the effects of the hold-up, but it is clear
that without adjustment neither year’s figures are suitable for comparison with
those for 1929, in determining the extent of the recovery from the depression of
the intervening years. In spite of the cocoa hold-up, a record tonnage was handled
by the railway in 1937, and in normal circumstances this would have been a peak
year with respect to gross and net receipts; but the record tonnage was due partly
to a record manganese traffic, which brings in less revenue per ton than cocoa. In
view of the difficulty of estimating the effect of the cocoa hold-up on the 1937 and
1938 results, it is probably best, when making comparisons with 1929, to use the
average of the 1937 and 1938 figures; this average is shown in Table XII.

Table XII shows that the value of foreign trade in the Gold Coast fell to
a greater extent than world trade, but recovered more quickly, and in 1937
exceeded the 1929 value by 15 per cent. As in Nigeria, however, there was a con-
siderable recession in 1938. Coaching receipts were / affected more than goods
receipts during the slump, and with no extension of mileage both gross and net
revenues at the end of the decade showed no improvement over the 1929 lev-
els; but this was due mainly to the reductions in rates and fares, although road
transport had doubtless taken profitable traffic from the railway. The net revenue remained considerably below the 1929 level throughout the greater part of the decade, and although railway revenue appears to have recovered from the slump at an earlier date in the Gold Coast than in Nigeria, it failed to show any real improvement over the 1929 figures.

**Table XII. – Indexes of Working Results (1929 = 100).**

<table>
<thead>
<tr>
<th>Year</th>
<th>World trade, sterling</th>
<th>Gold coast foreign trade</th>
<th>Railway mileage</th>
<th>Coaching receipts</th>
<th>Goods</th>
<th>Gross</th>
<th>Net</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>Amount</td>
<td>Index</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>1930</td>
<td>81</td>
<td>82</td>
<td>52</td>
<td>55</td>
<td>55</td>
<td>48</td>
<td>43</td>
</tr>
<tr>
<td>1931</td>
<td>82</td>
<td>52</td>
<td>55</td>
<td>47</td>
<td>47</td>
<td>71</td>
<td>81</td>
</tr>
<tr>
<td>1932</td>
<td>52</td>
<td>55</td>
<td>47</td>
<td>66</td>
<td>66</td>
<td>115</td>
<td>66</td>
</tr>
<tr>
<td>1933</td>
<td>55</td>
<td>52</td>
<td>66</td>
<td>84</td>
<td>66</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td>1934</td>
<td>52</td>
<td>47</td>
<td>84</td>
<td>66</td>
<td>91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1935</td>
<td>55</td>
<td>66</td>
<td>84</td>
<td>66</td>
<td>91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1936</td>
<td>62</td>
<td>115</td>
<td>66</td>
<td>66</td>
<td>91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1937</td>
<td>77</td>
<td>77</td>
<td>66</td>
<td>66</td>
<td>91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1938</td>
<td>68</td>
<td>68</td>
<td>66</td>
<td>66</td>
<td>91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1939</td>
<td>72</td>
<td>72</td>
<td>66</td>
<td>66</td>
<td>91</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Passenger Traffic.** – In **Table XIII** the passenger statistics for 1929 are compared with the mean of the 1937 and 1938 figures.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of passengers</th>
<th>Passenger receipts</th>
<th>Passenger miles</th>
<th>Average fare paid per mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>1,873,662</td>
<td>£245,982</td>
<td>53,540,414</td>
<td>1.10d.</td>
</tr>
<tr>
<td>1938</td>
<td>3,397,137</td>
<td>£186,164</td>
<td>92,294,004</td>
<td>0.48d.</td>
</tr>
</tbody>
</table>

Although the number of passengers increased by 81 per cent., and the passenger-miles by 72 per cent., the passenger receipts were 24 per cent. lower at the end of the decade, owing to a reduction of 57 per cent. in the average fare. Doubtless the railway was forced to make fare reductions to meet the competition of road transport, but the extent to which users of the railway have benefited from cheaper travel should not be overlooked. There is little doubt that railway receipts have suffered more from the reduction of fares on the traffic retained than from the absolute loss of traffic to road transport. Experience in Nigeria and the Gold Coast – and also in other colonies – shows that colonial railways can retain a large proportion of their passenger traffic if fares are reduced to a sufficiently low level – but without financial gain.

*  Imports plus domestic exports, but exclusive of bullion.
†  Before providing for renewals.
*Goods Traffic.* – In Table XIV the goods receipts for 1929 are compared with the average receipts for 1937 and 1938.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>932,229</td>
<td>£866,665</td>
<td>52.5</td>
<td>48,943,561</td>
<td>4.22d.</td>
</tr>
<tr>
<td>Average of 1937 and 1938</td>
<td>918,300</td>
<td>£804,213</td>
<td>61.5</td>
<td>55,596,511</td>
<td>3.45d.</td>
</tr>
</tbody>
</table>
| Difference between 1929 and average of 1937 and 1938 | -2                    | -7              | +17                           | +14                       | -18 /                     

Although at the end of the decade the net goods ton-miles were 14 per cent. more than in 1929, the paying tonnage handled was 2 per cent. less. This was doubtless due to the loss of short-distance traffic to the roads. The increase in net ton-miles was more than balanced by reductions in rates, and goods receipts at the end of the decade were 7 per cent. lower than in 1929. Although the gross receipts did not recover to the 1929 level, the working expenditure was reduced, and in 1936 and 1938 the net receipts exceeded those of 1929. At the end of the decade more traffic was being handled, at lower cost, but the financial results did not show the same improvement as in Nigeria. Moreover, the average rate charged was double that on the Nigerian railway.

The tonnages of the most important commodities carried by rail during the 10 years are shown in Table XV. Coal, wines and spirits, timber, and manganese ore suffered most from the world slump, whilst cocoa varied to only a small extent; but the tonnage at the end of the decade was no larger than at the beginning, whilst, owing to development in the gold mining industry, machinery showed a considerable increase. During the latter years the volume of wines and spirits was less than half that of 1929, reflecting the vulnerability of this class of traffic to the competition of road transport. Cocoa varied only slightly in volume from year to year, whilst timber for export and manganese ore suffered to the full extent from the decline in world industry during the earlier years of the decade; but these products recovered more rapidly, and in 1937 record tonnages were attained. During the 1938 recession in world trade, however, the demand for timber and manganese ore was reduced to such an extent that the tonnages railed to the coast were less than half the 1937 figures.

In 5 of the 10 years included in Table XV more than half of the total tonnage dealt with by the railway consisted of manganese ore. The Gold Coast railway is one of the few colonial railways that has important mineral traffic: the principal demand for the mineral is for the manufacture of steel, and very little is used for other purposes. About 2 tons of manganese ore is required for 100 tons of steel,
and the world consumption of manganese ore will vary directly with the world production of steel. A considerable part of the ore mined in the Gold Coast is shipped to America, and the following figures of steel-ingot production in the United States in 1937, 1938, and 1939 will explain to a large extent why manganese ore traffic on the Gold Coast railway in 1938 was only half the volume in 1937:–

<table>
<thead>
<tr>
<th>Year</th>
<th>Steel-ingot Production (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1937</td>
<td>50,318,000</td>
</tr>
<tr>
<td>1938</td>
<td>28,200,000</td>
</tr>
<tr>
<td>1939</td>
<td>46,800,000</td>
</tr>
</tbody>
</table>

Table XV. – Principal Commodities Railed: Tons.

<table>
<thead>
<tr>
<th>Year</th>
<th>Firewood</th>
<th>Coal</th>
<th>Wines and spirits</th>
<th>Machinery</th>
<th>Local produce</th>
<th>Cocoa</th>
<th>Timber (exported)</th>
<th>Manganese ore</th>
<th>Total (including miscellaneous goods)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>122,618</td>
<td>13,033</td>
<td>2,685</td>
<td>689</td>
<td>10,868</td>
<td>139,462</td>
<td>10,523</td>
<td>507,075</td>
<td>932,229</td>
</tr>
<tr>
<td>1930</td>
<td>96,120</td>
<td>8,646</td>
<td>1,072</td>
<td>1,381</td>
<td>10,236</td>
<td>132,499</td>
<td>7,891</td>
<td>396,895</td>
<td>758,888</td>
</tr>
<tr>
<td>1931</td>
<td>96,826</td>
<td>2,086</td>
<td>924</td>
<td>503</td>
<td>7,544</td>
<td>123,488</td>
<td>3,593</td>
<td>208,767</td>
<td>526,313</td>
</tr>
<tr>
<td>1932</td>
<td>99,627</td>
<td>1,579</td>
<td>698</td>
<td>1,303</td>
<td>8,208</td>
<td>121,987</td>
<td>5,567</td>
<td>73,099</td>
<td>391,077</td>
</tr>
<tr>
<td>1933</td>
<td>107,035</td>
<td>2,913</td>
<td>472</td>
<td>4,332</td>
<td>8,716</td>
<td>125,860</td>
<td>5,085</td>
<td>335,927</td>
<td>663,180</td>
</tr>
<tr>
<td>1934</td>
<td>113,519</td>
<td>4,328</td>
<td>468</td>
<td>9,468</td>
<td>11,228</td>
<td>122,395</td>
<td>16,338</td>
<td>357,581</td>
<td>729,887</td>
</tr>
<tr>
<td>1935</td>
<td>122,149</td>
<td>7,236</td>
<td>662</td>
<td>17,100</td>
<td>15,411</td>
<td>130,553</td>
<td>15,209</td>
<td>465,679</td>
<td>911,709</td>
</tr>
<tr>
<td>1936</td>
<td>143,383</td>
<td>10,464</td>
<td>951</td>
<td>16,534</td>
<td>14,784</td>
<td>140,110</td>
<td>14,508</td>
<td>442,611</td>
<td>1,004,876</td>
</tr>
<tr>
<td>1937</td>
<td>109,099</td>
<td>21,265</td>
<td>1,084</td>
<td>26,058</td>
<td>14,508</td>
<td>34,622</td>
<td>17,535</td>
<td>566,152</td>
<td>830,659</td>
</tr>
<tr>
<td>1938</td>
<td>84,484</td>
<td>18,068</td>
<td>1,069</td>
<td>5,844</td>
<td>19,801</td>
<td>207,808</td>
<td>8,107</td>
<td>268,089</td>
<td></td>
</tr>
</tbody>
</table>

The railway is largely dependent upon cocoa and manganese ore for its goods receipts, as is evident from the following figures:–

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue from cocoa (£)</th>
<th>Revenue from manganese ore (£)</th>
<th>Total goods revenue (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1936</td>
<td>£341,646</td>
<td>£143,784</td>
<td>£856,897</td>
</tr>
<tr>
<td>1937</td>
<td>£82,447</td>
<td>£183,999</td>
<td>£665,718</td>
</tr>
<tr>
<td>1938</td>
<td>£505,638</td>
<td>£100,554</td>
<td>£942,709</td>
</tr>
</tbody>
</table>

Of these two commodities, which account for something like 55 per cent. of the total goods receipts, cocoa, the more remunerative traffic, is a food the consumption of which is unlikely to vary widely from year to year, but manganese ore is a raw material, and its consumption will vary with steel production, which is often regarded as a yardstick of industrial activity. Moreover, a reduction in demand for the ore is likely to precede a reduction in steel production, as steel-makers will operate on their stocks as soon as there is a diminution in new orders. For this reason it is difficult to foresee a change in the demand.
The principal operating results at the beginning and end of the decade were as follows:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross railway receipts</td>
<td>£1,183,035</td>
<td>£1,057,858</td>
<td>– 10</td>
</tr>
<tr>
<td>Working expenditure</td>
<td>£539,422</td>
<td>£500,124</td>
<td>– 7</td>
</tr>
<tr>
<td>Surplus of receipts over expenditure</td>
<td>£643,613</td>
<td>£557,734</td>
<td>– 13</td>
</tr>
<tr>
<td>Passengers carried</td>
<td>1,873,662</td>
<td>3,397,137</td>
<td>+ 81</td>
</tr>
<tr>
<td>Average fare paid</td>
<td>110d</td>
<td>48d</td>
<td>– 57</td>
</tr>
<tr>
<td>Paying ton-mileage</td>
<td>48,943,561</td>
<td>55,596,511</td>
<td>+ 14</td>
</tr>
<tr>
<td>Average rate per ton-mile</td>
<td>422d</td>
<td>345d</td>
<td>– 18</td>
</tr>
</tbody>
</table>

Financially the results for 1937 and 1938 were not so satisfactory as for 1929, but more work was done at lower cost, and the reduced receipts were the consequence of cheaper rates and fares.

In 1938 it was necessary to meet the following charges from net receipts:

- Interest and loan charges £349,217
- Sinking-fund contributions £54,448
- Renewals-funds contributions £140,671
- Total £544,336

The average net receipts over the two years 1937 and 1938 were £557,734, and the railway was able, therefore, to meet all charges from its revenue. In considering the financial results of a railway's operations, it does not appear necessary to debit the net receipts with sinking fund charges when an adequate sum is set aside yearly to cover the renewal of wasting assets. By means of the renewals fund the railway and its equipment can be adequately maintained without further capital expenditure, and this is all that a commercially-owned railway attempts to do, as no part of the revenue is set aside for the redemption of capital. It is true that the loans raised for the construction of the railway have eventually to be redeemed, but it can be assumed that the Government will be able to raise further loans, if necessary, as they did when the railway was constructed. If the principle is accepted that the railway is financially sound, provided that its net receipts are sufficient to cover interest charges and renewals contributions, the sum of £490,000 is required annually for this purpose. During the 10 years 1929 to 1938 the net receipts averaged £478,105 yearly, or nearly sufficient to meet the railway’s financial obligations, even though the period included several years of acute world industrial depression.

Funds for the construction and equipment of the railway were provided partly by interest-bearing loans and partly by sums advanced by the Colonial Government from surplus revenue, which are free of interest. Expenditure on capital account reached a maximum in 1937, when it amounted to £9,374,991; but in 1938 capital expenditure was written down by £773,525 by a charge against
the depreciation account, and in the Administration report for 1938–1939 the total capital expenditure is shown as £8,686,238, of which £6,776,699 is represented by interest-bearing loans. In 1928 interest-bearing loans amounted to £8,510,986, with annual charges for interest and sinking fund of £493,443, but loan indebtedness has since been reduced by redemption to £6,776,699, with annual charges of £403,655. There has thus been a reduction in loan indebtedness of £1,734,197, and of annual charges of £89,788, since 1928, with the result that the financial position of the railway has been considerably strengthened. Further, there was a balance of £651,901 in the sinking fund account for the amortization of outstanding loans, leaving little more than £6,000,000 to be provided in the future for the repayment of interest-bearing loans.

Kenya and Uganda Railways.

Indexes showing the revenue earned during the 10-year period 1929–1938 are given in Table XVI.

Railway extensions were in progress at the beginning of the decade, and by 1931 a total of 200 miles had been added to open lines. The foreign trade of Kenya and Uganda did not suffer during the world depression to quite the same extent as did world trade, whilst it recovered more rapidly, and in 1937 was 13 per cent. above the 1929 level; but as in other colonies, there was a recession in 1938.

Owing perhaps to the additional mileage, the goods, gross, and net receipts did not reach quite such low levels during the slump as did those of other Colonial railways, and in 1937 goods receipts were 19 per cent. above and net receipts 45 per cent. above the values in 1929. On the other hand, coaching receipts failed to recover, and in 1937 were still one-third below the 1929 level. They are, however, small in comparison with goods receipts, and in 1937 and 1938 amounted to only 8½ per cent. of the gross receipts.

Table XVI – Indexes of Working Results (1929=100).

<table>
<thead>
<tr>
<th></th>
<th>1929</th>
<th>1930</th>
<th>1931</th>
<th>1932</th>
<th>1933</th>
<th>1934</th>
<th>1935</th>
<th>1936</th>
<th>1937</th>
<th>1938</th>
</tr>
</thead>
<tbody>
<tr>
<td>World trade, sterling value.</td>
<td>100</td>
<td>81</td>
<td>62</td>
<td>54</td>
<td>55</td>
<td>58</td>
<td>62</td>
<td>77</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>*Kenya and Uganda foreign trade</td>
<td>£16,724,000</td>
<td>100</td>
<td>80</td>
<td>60</td>
<td>55</td>
<td>67</td>
<td>77</td>
<td>90</td>
<td>113</td>
<td>100</td>
</tr>
<tr>
<td>Railway mileage</td>
<td>1,426</td>
<td>100</td>
<td>107</td>
<td>114</td>
<td>114</td>
<td>114</td>
<td>114</td>
<td>114</td>
<td>114</td>
<td>114</td>
</tr>
<tr>
<td>Railway coaching receipts</td>
<td>£348,358</td>
<td>100</td>
<td>98</td>
<td>75</td>
<td>60</td>
<td>58</td>
<td>56</td>
<td>60</td>
<td>67</td>
<td>65</td>
</tr>
<tr>
<td>Railway goods receipts</td>
<td>£2,035,369</td>
<td>100</td>
<td>89</td>
<td>78</td>
<td>78</td>
<td>97</td>
<td>105</td>
<td>111</td>
<td>119</td>
<td>117</td>
</tr>
<tr>
<td>Railway gross receipts</td>
<td>£2,448,960</td>
<td>100</td>
<td>90</td>
<td>78</td>
<td>75</td>
<td>91</td>
<td>97</td>
<td>103</td>
<td>111</td>
<td>109</td>
</tr>
<tr>
<td>†Railway net receipts</td>
<td>£1,003,890</td>
<td>100</td>
<td>77</td>
<td>60</td>
<td>79</td>
<td>123</td>
<td>129</td>
<td>138</td>
<td>145</td>
<td>126</td>
</tr>
</tbody>
</table>

* Imports plus domestic exports, but exclusive of bullion.
† Before providing for renewals.
Passenger Traffic. – In Table XVII the number of passengers and the passenger receipts in 1938, which were slightly higher than in 1937, are compared with 1929. The numbers of passenger-miles in the 2 years are not available, but, owing to the increase in mileage, it is probable that the average length of journey in 1938 was greater than in 1929.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of passengers</th>
<th>Passenger receipts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>1,161,770</td>
<td>£293,688</td>
</tr>
<tr>
<td>1938</td>
<td>886,039</td>
<td>£192,413</td>
</tr>
</tbody>
</table>

The number of passengers is small in comparison with the mileage of the railway because so much of the territory served is sparsely populated. Fares have been reduced in recent years, and the third-class fare is now a little less than ½ d. per mile.

Goods Traffic. – In Table XVIII the goods statistics for 1938 are compared with those for 1929. Goods receipts were slightly higher in 1937, but the tonnage transported in 1938 was greater.

<table>
<thead>
<tr>
<th>Year</th>
<th>Public goods tonnage</th>
<th>Public goods receipts</th>
<th>Average length of haul: miles</th>
<th>Net ton-mileages, public goods traffic</th>
<th>Average rate per ton-mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>952,934</td>
<td>£1,989,080</td>
<td>292</td>
<td>278,256,728</td>
<td>1.61d.</td>
</tr>
<tr>
<td>1938</td>
<td>1,050,881</td>
<td>£2,347,835</td>
<td>440</td>
<td>462,129,386</td>
<td>1.21d.</td>
</tr>
</tbody>
</table>

It will be seen that as a result of the longer haul a 10-per-cent. larger tonnage produced a 23-per-cent. increase in receipts, in spite of lower rates; the average rate charged per ton-mile was reduced by 25 per cent. during the 10-year period. Goods receipts were maintained at a higher level relative to other Colonial railways during the years of depression, but it must not be overlooked that 200 miles of new lines were brought into operation during 1930 and 1931. The 66-per-cent. increase in net ton-mileage demonstrates the increased importance of the railway as a medium of transport.

The tonnages of some of the more important commodities carried by rail during the 10 years are shown in Table XIX. Maize and wheat suffered the greatest reduction during the slump, their tonnages being reduced to about one-third of the 1929 figures. Although these cereals are carried at the lowest rates, the long rail haul to the coast prevents profitable marketing abroad when world prices are low. With the exception of maize, wheat, and soda-ash, the tonnages of all the other commodities included in the Table increased considerably during the
latter years of the decade; the tonnages of cotton, cotton-seed, and coffee railed to the coast in 1938 were the highest on record. The total tonnage of goods carried for the public was only 10 per cent. higher in 1938 than in 1929, whilst the domestically-produced commodities included in Table XIX increased by 39 per cent.; the difference in these two percentages was doubtless largely due to the loss of other traffic to road transport.

The highest class rate (class 3) is 6d. per ton-mile, and three other classes, Nos. 4, 5, and 6, exceed 3d. per ton-mile. The total tonnage carried under these rates in 1938 was 93,279. The lower rates include classes Nos. 7, 8, 9, and 10, exceptional rates, and export rates. Class 10 rate is 1.2d. per ton-mile; 165,129 tons of goods were carried at this rate in 1938, whilst 168,125 tons were carried at exceptional rates and 439,488 tons at export rates. Rates are tapered, but in 1938 large tonnages were moved under exceptional rates at ¾d. per ton-mile, and under export rates at little more than ¼d. per ton-mile. Of a total public tonnage of 1,050,881 tons, 93,279 tons were moved at rates exceeding 3d. per ton-mile, 349,989 tons at rates between l.2d and 3d. per ton-mile, and 607,613 tons at the lowest two rates. /  

Table – XIX. Principal Commodities Railed: Tons.

<table>
<thead>
<tr>
<th></th>
<th>1929</th>
<th>1930</th>
<th>1931</th>
<th>1932</th>
<th>1933</th>
<th>1934</th>
<th>1935</th>
<th>1936</th>
<th>1937</th>
<th>1938</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee</td>
<td>22,595</td>
<td>38,833</td>
<td>33,797</td>
<td>40,011</td>
<td>42,799</td>
<td>42,745</td>
<td>56,836</td>
<td>63,743</td>
<td>58,775</td>
<td>71,638</td>
</tr>
<tr>
<td>Cotton, ginned and unginned.</td>
<td>41,325</td>
<td>26,055</td>
<td>38,574</td>
<td>38,888</td>
<td>58,699</td>
<td>55,733</td>
<td>52,231</td>
<td>69,133</td>
<td>68,963</td>
<td>83,585</td>
</tr>
<tr>
<td>Fibre, sisal.</td>
<td>15,129</td>
<td>14,312</td>
<td>11,209</td>
<td>13,919</td>
<td>19,284</td>
<td>22,593</td>
<td>30,410</td>
<td>34,463</td>
<td>32,088</td>
<td>28,770</td>
</tr>
<tr>
<td>Maize</td>
<td>96,366</td>
<td>154,354</td>
<td>25,967</td>
<td>29,828</td>
<td>30,829</td>
<td>40,223</td>
<td>31,203</td>
<td>106,742</td>
<td>72,738</td>
<td>87,401</td>
</tr>
<tr>
<td>Wheat</td>
<td>15,629</td>
<td>21,214</td>
<td>5,710</td>
<td>6,346</td>
<td>6,385</td>
<td>6,990</td>
<td>7,472</td>
<td>12,820</td>
<td>15,138</td>
<td>12,433</td>
</tr>
<tr>
<td>Cotton-seeds.</td>
<td>71,943</td>
<td>38,957</td>
<td>50,985</td>
<td>60,060</td>
<td>86,598</td>
<td>40,755</td>
<td>56,119</td>
<td>94,849</td>
<td>84,393</td>
<td>128,866</td>
</tr>
<tr>
<td>Soda-ash</td>
<td>61,798</td>
<td>44,164</td>
<td>43,851</td>
<td>42,529</td>
<td>37,379</td>
<td>31,486</td>
<td>42,882</td>
<td>42,537</td>
<td>43,144</td>
<td>30,275</td>
</tr>
<tr>
<td>Wattle-bark</td>
<td>4,595</td>
<td>7,008</td>
<td>11,570</td>
<td>15,168</td>
<td>22,170</td>
<td>23,339</td>
<td>27,640</td>
<td>27,347</td>
<td>28,169</td>
<td>16,227</td>
</tr>
<tr>
<td>Total</td>
<td>329,380</td>
<td>459,195</td>
<td>50,985</td>
<td>60,060</td>
<td>86,598</td>
<td>40,755</td>
<td>56,119</td>
<td>94,849</td>
<td>84,393</td>
<td>128,866</td>
</tr>
</tbody>
</table>

The principal operating results for 1929 and 1938 are tabulated below: –

<table>
<thead>
<tr>
<th></th>
<th>1920</th>
<th>1938</th>
<th>Percentage-change, 1929 to 1938.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross railway receipts</td>
<td>£2,448,960</td>
<td>£2,659,176</td>
<td>+8</td>
</tr>
<tr>
<td>Working expenditure (exclusive of renewals)</td>
<td>£1,445,070</td>
<td>£1,396,970</td>
<td>–4</td>
</tr>
<tr>
<td>Surplus of receipts over expenditure</td>
<td>£1,003,890</td>
<td>£1,262,206</td>
<td>+26</td>
</tr>
<tr>
<td>Passengers carried</td>
<td>1,161,770</td>
<td>886,039</td>
<td>–24</td>
</tr>
<tr>
<td>Public ton-mileage</td>
<td>278,256,728</td>
<td>462,129,386</td>
<td>+66</td>
</tr>
<tr>
<td>Average rate paid per ton-mile</td>
<td>1.61d.</td>
<td>1.21d.</td>
<td>–25</td>
</tr>
</tbody>
</table>
The number of passengers in 1938 was lower than in 1929; but passenger traffic amounts to only 8½ per cent. of the railway revenue, and the very large increase in public goods ton-mileage was met without any addition to working expenditure.

In 1938 interest-charges on railway loans amounted to £542,119, and £347,560 was contributed to the railway renewals fund. If, therefore, sinking-fund charges are not brought into account, and it is agreed that the railway is financially sound provided that its net receipts are sufficient to cover interest charges and renewals, £889,679 is required annually in addition to working expenses. During the 10 years 1929 to 1938 the average net annual receipts were £1,090,343, or more than sufficient to meet the railway’s financial obligations.

By the end of 1938 capital expenditure reached the sum of £22,340,321, but interest was payable on only £14,035,321 of this amount, the remainder having been obtained from parliamentary grants and other sources. Since 1929 the interest-bearing debt has increased by £1,278,120, and interest charges by £56,250 per annum, but 200 miles of new track has been opened for traffic during the period.

**Tanganyika Railway.**

Indexes showing the revenue earned by the Tanganyika railways during the 10-year period 1929 to 1938 are tabulated in Table XX. There was an addition to open lines during the decade consequent upon the completion of the Kinyanggiri branch.

Tanganyika’s foreign trade fell during the worst period of the world depression to half its value in 1929, and this could not fail to affect railway revenue. Coaching receipts suffered more than goods receipts and – as in other colonies – never recovered to the 1929 level. During the worst 3 years of the depression goods receipts amounted to only about two-thirds of their value in 1929, but recovered subsequently, and in 1937 exceeded the 1929 level. Goods receipts did not, however, increase after the slump to the same extent as foreign trade. The net receipts varied widely during the 10-year period; but the volume of traffic is small in comparison with the length of line, and the railway is physically capable of dealing with a denser traffic. Consequently a moderate increase in traffic can be met without appreciable increase in working expenses, and net receipts increase faster proportionately than gross receipts.
TABLE XX. – INDEXES OF WORKING RESULTS (1929 = 100).

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount.</th>
<th>Index.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>1930</td>
<td>81</td>
<td>82</td>
</tr>
<tr>
<td>1931</td>
<td>62</td>
<td>65</td>
</tr>
<tr>
<td>1932</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>1933</td>
<td>52</td>
<td>59</td>
</tr>
<tr>
<td>1934</td>
<td>55</td>
<td>76</td>
</tr>
<tr>
<td>1935</td>
<td>58</td>
<td>93</td>
</tr>
<tr>
<td>1936</td>
<td>62</td>
<td>105</td>
</tr>
<tr>
<td>1937</td>
<td>77</td>
<td>82</td>
</tr>
<tr>
<td>1938</td>
<td>68</td>
<td>82</td>
</tr>
</tbody>
</table>

World trade, sterling value.

* Tanganyika foreign trade

Railway mileage:

Railway coaching receipts

Railway goods receipts

Railway gross receipts

† Railway net receipts

**Passenger Traffic.** In Table XXI the passenger statistics for 1938 and 1929 – the two peak years – are compared.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of passengers</th>
<th>Passenger receipts</th>
<th>Average length of journey: miles</th>
<th>Passenger-miles</th>
<th>Average fare paid per mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>538,750</td>
<td>£123,490</td>
<td>82</td>
<td>44,177,500</td>
<td>0.67d</td>
</tr>
<tr>
<td>1938</td>
<td>499,603</td>
<td>£99,780</td>
<td>80</td>
<td>40,040,136</td>
<td>0.60d</td>
</tr>
</tbody>
</table>

Percentage change, 1929 to 1938:

-7 -19 -2 -9 -10

Although passenger traffic was less in 1938 than in 1929, there has been a large measure of recovery from the worst years of the depression, when passenger traffic dropped to little more than half the volume in 1929. The number of passengers is small considering the mileage of the railway, but in 1938 coaching receipts amounted to 20 per cent. of the gross railway receipts.

**Goods Traffic.** – The two peak years for goods traffic during the decade / were 1930 and 1937. The paying goods tonnage and receipts for these 2 years are shown below; the goods ton-mileage figures for 1930 are not available.

<table>
<thead>
<tr>
<th>Year</th>
<th>Goods tonnage</th>
<th>Goods receipts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1930</td>
<td>318,688</td>
<td>£632,268</td>
</tr>
<tr>
<td>1937</td>
<td>302,764</td>
<td>£552,138</td>
</tr>
</tbody>
</table>

Percentage change, 1930 to 1937:

-5 -13

The average rate paid per ton-mile in 1937 was 2.1d. In spite of an increase in mileage, neither coaching nor goods receipts have recovered to the level of

* Imports plus domestic exports, but exclusive of bullion.
† Before providing for renewals.
the peak year at the beginning of the decade, and there has been no increase in
the volume of work done such as has occurred in Nigeria, in the Gold Coast
Colony, and in Kenya and Uganda, although the value of foreign trade was 5
per cent. higher in 1937 than in 1929. Remunerative traffic has been lost to
the roads, whilst a considerable volume of traffic which formerly passed over
the Tanganyika railway to and from the Belgian Congo has been diverted to
Matadi, on the west coast. The extent of this loss is evident from the following
figures:

<table>
<thead>
<tr>
<th>Traffic to and from Belgian territories.</th>
<th>Tons.</th>
<th>Receipts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1930</td>
<td>71,415</td>
<td>£313,461</td>
</tr>
<tr>
<td>1937</td>
<td>7,413</td>
<td>£72,610</td>
</tr>
</tbody>
</table>

In 1930 this traffic accounted for one-half of the revenue of the Central Line,
and one-third of the total revenue of the railway. As will be shown in a later
paragraph, the tonnage of domestically-produced commodities increased in the
later years in correspondence with the advance in foreign trade, but this did not
entirely compensate for the loss of traffic with the Belgian Congo – a traffic of
maximum length of haul – and for the loss due to road motors.

The tonnages of some of the more important commodities carried by rail
during the 10 years are shown in Table XXII. Cotton, cotton-seed, and timber
suffered most during the slump, but in 1937 all improved on their 1929 ton-
nages. Coffee, hides, and skins and sisal also recorded substantial increases, the
tonnages railed at the end of the decade being double those at the beginning.
Ground nuts varied widely from year to year, and following considerable ton-
nages in 1935, 1936, and 1937, the quantity railed during 1938 was the lowest
in the decade. The total tonnage of the commodities included in Table XXII
was 50 per cent. higher in 1937 than in 1930, indicating a considerable increase
in the –marketing of colonial produce, due mainly to the increased production
of / sisal. But for the lack of confidence consequent upon political uncertainty,
development would, perhaps, have been greater.
Table XXII. – Principal Commodities Railed: Tons.

<table>
<thead>
<tr>
<th></th>
<th>1929-30.</th>
<th>1930-31</th>
<th>1931-32 (9 months)</th>
<th>1933</th>
<th>1934</th>
<th>1935</th>
<th>1936</th>
<th>1937</th>
<th>1938</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee</td>
<td>1,914</td>
<td>2,805</td>
<td>1,467</td>
<td>2,121</td>
<td>3,119</td>
<td>2,264</td>
<td>4,903</td>
<td>4,203</td>
<td>3,692</td>
</tr>
<tr>
<td>Cotton (ginned and unginned)</td>
<td>9,776</td>
<td>5,024</td>
<td>2,785</td>
<td>4,939</td>
<td>4,312</td>
<td>5,734</td>
<td>9,805</td>
<td>9,806</td>
<td>11,025</td>
</tr>
<tr>
<td>Cotton-seed</td>
<td>5,699</td>
<td>2,057</td>
<td>1,802</td>
<td>2,073</td>
<td>2,492</td>
<td>2,659</td>
<td>3,512</td>
<td>8,067</td>
<td>9,862</td>
</tr>
<tr>
<td>Grain</td>
<td>20,428</td>
<td>16,573</td>
<td>14,407</td>
<td>19,940</td>
<td>21,488</td>
<td>26,500</td>
<td>23,848</td>
<td>23,227</td>
<td>31,480</td>
</tr>
<tr>
<td>Ground nuts</td>
<td>7,554</td>
<td>17,486</td>
<td>2,908</td>
<td>14,687</td>
<td>7,708</td>
<td>15,663</td>
<td>21,457</td>
<td>20,895</td>
<td>2,783</td>
</tr>
<tr>
<td>Hides and skins</td>
<td>1,837</td>
<td>1,706</td>
<td>1,870</td>
<td>1,428</td>
<td>3,800</td>
<td>3,546</td>
<td>4,727</td>
<td>4,351</td>
<td>4,082</td>
</tr>
<tr>
<td>Sisal and sisal tow</td>
<td>28,570</td>
<td>34,518</td>
<td>37,600</td>
<td>30,675</td>
<td>44,002</td>
<td>49,193</td>
<td>52,323</td>
<td>51,316</td>
<td>65,008</td>
</tr>
<tr>
<td>Timber</td>
<td>4,158</td>
<td>2,296</td>
<td>514</td>
<td>358</td>
<td>775</td>
<td>2,006</td>
<td>4,851</td>
<td>6,548</td>
<td>9,127</td>
</tr>
<tr>
<td>Total</td>
<td>79,936</td>
<td>82,465</td>
<td>63,353</td>
<td>76,221</td>
<td>97,696</td>
<td>99,043</td>
<td>119,632</td>
<td>128,975</td>
<td>148,886</td>
</tr>
</tbody>
</table>

The principal operating results for 1930 and 1937 are tabulated below:

<table>
<thead>
<tr>
<th></th>
<th>1930</th>
<th>1937</th>
<th>Percentage-change, 1930 to 1937</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route mileage</td>
<td>1,282</td>
<td>1,376</td>
<td>+7</td>
</tr>
<tr>
<td>Gross railway receipt</td>
<td>£798,023</td>
<td>£691,582</td>
<td>-13</td>
</tr>
<tr>
<td>Working expenditure, exclusive of renewals</td>
<td>£556,949</td>
<td>£337,663</td>
<td>-40</td>
</tr>
<tr>
<td>Receipts per route-mile</td>
<td>£622</td>
<td>£503</td>
<td>-19</td>
</tr>
<tr>
<td>Expenditure per route-mile</td>
<td>£434</td>
<td>£245</td>
<td>-43</td>
</tr>
<tr>
<td>Surplus of receipts over expenditure</td>
<td>£241,074</td>
<td>£353,919</td>
<td>+47</td>
</tr>
<tr>
<td>Goods tonnage</td>
<td>554,980</td>
<td>460,730</td>
<td>-17</td>
</tr>
<tr>
<td>Total</td>
<td>318,688</td>
<td>302,764</td>
<td>-5</td>
</tr>
</tbody>
</table>

In spite of the decrease in traffic, the net receipts were 47 per cent, higher in 1937 than in 1930, owing to the very substantial reduction in working expenditure. The density of traffic is very low in comparison with the other Colonial railways dealt with in this report, as will be seen from the following figures relative to 1938.

<table>
<thead>
<tr>
<th></th>
<th>Route mileage</th>
<th>Gross receipts, per mile</th>
<th>Working expenditure, per mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nigeria</td>
<td>1,900</td>
<td>£1,123</td>
<td>£708</td>
</tr>
<tr>
<td>Gold Coast</td>
<td>500</td>
<td>£2,384</td>
<td>£1,004</td>
</tr>
<tr>
<td>Kenya and Uganda</td>
<td>1,625</td>
<td>£1,636</td>
<td>£860</td>
</tr>
<tr>
<td>Tanganyika</td>
<td>1,376</td>
<td>£420</td>
<td>£245</td>
</tr>
</tbody>
</table>

A noteworthy feature of the above figures is the low operating cost per mile of the Tanganyika railway.

The Kinyangiri branch, 94 miles in length, runs in a northerly direction from Manyoni on the Central railway and attains an altitude of more than 5,000 feet; it was opened in 1932. Revenue from the branch increased steadily, if slowly, until 1937, but in 1938 there was a very definite recession, and the receipts
amounted to only a little more than half of the 1937 revenue. Gross receipts have always been sufficient to cover working expenditure, but net receipts have been inadequate to pay loan charges and make provision for renewals. In 1937, which was the best year, the deficit, when all charges were brought into account, amounted to £25,300, and the net loss since the branch was opened was estimated to amount to £230,500 at the end of 1938. The branch passes through a relatively thickly-populated area, but the use made of it has been disappointing. Between 1933 and 1937 the gross receipts increased from £4,900 to £19,500; and even if this rate of improvement be continued in the future, it will be some years before the branch will be self-supporting.

The Moshi-Arusha branch, 54 miles in length, which was completed in 1929, connects with the Northern lines. It is close to the Noi-Hahe link which joins the Northern line with the Kenya and Uganda railway, and is thus served by the two ports of Tanga and Mombasa, with the result that some of the traffic to and from the branch passes over the Kenya and Uganda railway in preference to the Tanganyika railway. Although the gross receipts are more than sufficient to cover working expenses, the net receipts are inadequate to pay loan charges and provide for renewals, and at the end of 1938 the total accrued deficit was estimated to amount to £177,200. Moreover, during recent years revenue has shown little improvement.

The Central and Tanga lines, when taken over on the 1st April, 1919, were valued at £4,894,050, but interest charges, are not paid on this amount. British capital expenditure on the railway subsequent to that date amounted to £4,578,485 at the end of 1938, on which the following charges are payable annually:

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest</td>
<td>223,443</td>
</tr>
<tr>
<td>Sinking fund</td>
<td>58,180</td>
</tr>
<tr>
<td>Total</td>
<td>281,623</td>
</tr>
</tbody>
</table>

It is estimated that £97,927 should be contributed annually to a renewals fund, and that, in order that the railway may be self-supporting, £321,372 should be available annually from net receipts for interest and renewals. During the 10-year period 1929 to 1938, the net receipts averaged £203,047 annually, or more than £100,000 per year less than the amount now required. The 10-year period includes the years of the world depression when net receipts were reduced to small proportions, and they do not, perhaps, indicate what may be expected in the future. During the 4 years 1935 to 1938 the net receipts averaged nearly £300,000, that is, sufficient to pay interest charges and to enable a considerable sum to be set aside for renewals. The total interest-bearing capital expenditure on railways, wharves, steamships, etc., is £5,056,624; but the accumulated sink-
ing fund at the end of 1938 amounted to £516,962, leaving about £4,500,000 to be provided in the future for the repayment of interest-bearing loans.

Having regard to the length of the line, the interest charges are not high relative to other Colonial railways, because nearly half of the cost of the system was provided by German capital. Additional traffic is all that is needed to make the railway financially sound and, but for the loss of so much of the Congo traffic, this would have been achieved already. Even now in prosperous years the railway is nearly able to meet its financial obligations from its own resources.

[...]
When the world recovers from the economic malaise from which it at present suffers, it will probably be found that Great Britain will need to find new markets for her manufactures. The efforts to achieve a greater measure of economic independence which so many nations have made in recent years will not be immediately relaxed, and, while the present restrictive effects of exchange variations, quotas, tariff walls, etc., may be modified, it is too much to expect that
international trade will be conducted under the simpler conditions of former years. Where, then, can new markets be found? The colonies and dependencies of the Crown offer a field of vast extent supporting a population of many millions of prospective buyers. Here will be found territories with sound finances, currencies linked to sterling, and none of the restrictions to trading which are found elsewhere. It can be confidently predicted that increased trade with the mother country will follow colonial development.

In recent years considerable sums have been spent by colonial Governments on the construction of new roads and railways, and additional expenditure will be necessary in the future for further development. Both roads and railways will be needed, and, in order that funds allocated for their construction may be spent to the best advantage, it is necessary to determine how each form of transport can best be utilized to provide the facilities required. When comparing road transport with rail transport it is necessary to bring into account:

(a) Construction and maintenance costs.
(b) The cost of moving traffic.
(c) The traffics for which each form of transport is peculiarly suitable.

In many colonies to-day road transport and rail transport are in active competition, and a study of the results of such competition may indicate in some measure the proper sphere of each and show how both should be developed in order that the needs of the community can best be served.

During the past ten years nearly 2,500 miles of new railway have been built by colonial Governments, the principal extensions being in the following territories:

Kenya and Uganda 907 Miles.
Nigeria 779 "
Ceylon 219 "
Tanganyika 200 "
Gold Coast 194 "
Malaya 158 "
Total 2,457 miles

In addition, a very large mileage of new roads was also built.

In the territories enumerated above, which support a population of over 42 millions, there existed, at the end of 1932, 7,394 miles of railway, about 37,500 miles of roads maintained by the Public Works Departments, and, in addition, a large mileage of roads maintained by native administrations, district councils, etc. Not all the roads are usable by motors in the wet season. In the African colonies most of the roads are of the ‘earth’ or ‘dirt’ type, and only a comparatively small mileage has been provided with a metal or gravel surface, while only a small proportion of the metalled roads have received tar treatment. As an example, in Tanganyika only 86 miles of a total of over 12,000 miles of road maintained
Spiller, ‘The Respective Merits of Roads and Railways for Colonial Development’

by the Public Works Department are metalled. In the older colonies a larger mileage of metalled roads exists, and in some cases metalled roads preceded the advent of railways. It will be realized that motor transport cannot be conducted over earth roads with the same ease and freedom from breakdown, nor at the same cost, as on the roads of a higher standard in more developed countries.

**Cost of Railway Construction.**

The cost of building railways will vary widely according to such factors as the physical characteristics of the country traversed, the gauge and weight of rail used, the standard of construction and the cost of labour, but the following examples can be quoted of the cost of constructing railway extensions in recent years:

<table>
<thead>
<tr>
<th>Colony</th>
<th>Gauge</th>
<th>Extension</th>
<th>Length: miles</th>
<th>Cost per mile: £</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nigeria</td>
<td>3 ft. 6 ins</td>
<td>Zaria to Gusau branch</td>
<td>108</td>
<td>7,047</td>
</tr>
<tr>
<td></td>
<td>3 ft. 6 ins</td>
<td>Gusau to Kaura Namoda extension</td>
<td>29½</td>
<td>4,579</td>
</tr>
<tr>
<td></td>
<td>3 ft. 6 ins</td>
<td>Idogo branch</td>
<td>24</td>
<td>4,985</td>
</tr>
<tr>
<td>Kenya and Uganda</td>
<td>Meter</td>
<td>Gilgil to Thomson’s Falls</td>
<td>48</td>
<td>3,291</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Toroto to Sorote</td>
<td>101½</td>
<td>5,322</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kisumu to Yala</td>
<td>32½</td>
<td>5,200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Naro Moru to Nanyuki</td>
<td>17¼</td>
<td>3,200</td>
</tr>
</tbody>
</table>

*Note.* – In the less expensive of the above lines second-hand permanent way was used.

It will be seen that under favourable conditions it is still possible to build metre or 3-feet 6-inch gauge railways at a cost not exceeding £5,000 a mile.

**Cost Of Road Construction.**

In most new countries financial reasons prevent the use of any but local materials for road construction, and in areas where road surfacing materials, such as laterite, gravel, or stone are not available an earth-surfaced road only is possible. With adequate drainage, untreated earth surfacing will support a moderate amount of traffic, although it is difficult to keep in good condition in all weathers, being dusty in dry weather and getting badly cut up in wet weather.

Besides depending upon the width and character of the road, the cost of construction will vary widely according to such factors as the topography of the country, the amount of clearing necessary, and the cost of labour. An earth road may vary from a track where little more has been done than felling and clearing the tree stumps to a properly drained and graded roadway with a carefully selected top surface.
Earth Roads. – In the Gold Coast roads have been constructed by communal (i.e. free) labour under the supervision of the Political Department at a cost of £26 per mile. This is an exceptionally low figure, as the average cost of grading and draining a double-track road in West Africa is from £150 to £200 per mile, while in East Africa the cost is from £200 to £300 per mile. These figures apply only to easy country, and include the cost of culverts, but not bridges of major importance.

Gravel and Broken Stone Roads. – In West Africa a Class I road with gravel or laterite surfacing costs about £400 per mile in easy country, but through heavy forest or more difficult country may cost £800 per mile.

In Uganda road construction is simplified by the existence almost everywhere of a laterite called ‘murram’, which is used for the surfacing, while the natural soil – a red earth – when consolidated forms a hard and compact foundation. A road 18 feet wide with a 6-inch ‘murram’ surfacing costs about £400 per mile, exclusive of major bridges, which are rarely necessary. In Kenya the cost of a similar road is somewhat greater.

Bituminous-Surfaced Roads. – A macadam road is difficult to maintain under tropical conditions for modern high-speed heavy traffic, as the binding material is sucked out and the heavy rains of the wet season disintegrate the surface. Apart from the discomfort due to dust, the loss of material from an untreated gravel- or stone-surfaced road is considerable, and the replacement of the material adds considerably to the cost of maintenance. The surface can be stabilized and the cost of maintenance reduced by the application of a cold bitumen emulsion or a hot mixture of tar and bitumen to the surface. Such treatment is costly, and in West Africa an 18-foot metalled road with tar or bitumen surface would cost at least £1,000 per mile.

Cost of Road Maintenance.
The cost of maintenance will depend mainly on the density of the traffic and the standard of surface which it is necessary to maintain. It will also be affected by climatic conditions. In East Africa many thousands of miles of earth roads are maintained at an average annual cost of less than £20 per mile. In West Africa the cost is higher, and probably approaches £40 per mile; while in Ceylon and Malaya, where the roads are metalled and the traffic is denser, the maintenance costs average £100 per mile.

Traffic-carrying Ability of Roads.
The selection of a suitable road surface should be based primarily on the volume and character of the traffic which the road will have to carry. It is clearly extravagant to provide an expensive surface for a small amount of traffic; while a low-grade surface will be physically incapable of supporting a heavy and intense
traffic. Opinions differ as to the amount of traffic for which various forms of road surfaces are suitable. In America a questionnaire was addressed to a large number of engineers asking how many vehicles a day could be carried by various types of road surfaces. Several hundred replies were received, and the weighted average of the answers gave the following results:

<table>
<thead>
<tr>
<th>Road Surface</th>
<th>Vehicles per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graded earth roads</td>
<td>220</td>
</tr>
<tr>
<td>Sand-clay and top soil roads</td>
<td>360</td>
</tr>
<tr>
<td>Gravel and water-bound macadam</td>
<td>800</td>
</tr>
<tr>
<td>Surface-treated roads</td>
<td>1,500–2,000</td>
</tr>
</tbody>
</table>

In America skilled labour is available, and a high standard of maintenance is possible. In undeveloped countries with native labour it would be unwise to assume that similarly surfaced roads could carry the same densities of traffic. Mr. C. L. Cox, M. Inst. C.E., the Director of Public Works in Nigeria, has expressed the view that under the best conditions a first-class gravel road in Nigeria cannot be maintained to carry a denser traffic than 500 tons a day. In new countries, therefore, probably one-half of the above figures would represent fair maximum loadings.

**The Economics of Road Surfaces.**

The most economical road surface is that which gives the cheapest return to its users, having regard to the cost of construction, the cost of maintenance and the cost of conveying transport over it. While it may not be difficult to estimate the cost of construction, it is more difficult to estimate the cost of maintenance for a given volume of traffic, and still more difficult to strike a balance between the two so that the annual charges are a minimum. The higher the standard of construction the less the cost of maintenance for a given volume of traffic, and vice versa. It will sometimes be found that the saving on interest charges due to the adoption of a low standard of construction is less than the additional cost of maintenance incurred in preserving the road surface. In other words, a higher standard of construction could have been provided in the first place, with all the advantages of additional safety, greater speed, lower cost of operation, and at no greater cost. In Australia it was found that sealing gravel roads with bitumen effected a saving in maintenance costs of £35 per mile per year, which if capitalized would have been more than sufficient to pay the cost of sealing. If, however, the reduced operating costs of the vehicles are taken into account, the total saving was estimated to amount to £150 per mile per year.

While a superior standard of construction will reduce maintenance charges, a still greater saving will be effected in the operating costs of the motor vehicles using the road. The tractive effort per ton (2,240 lbs.) on different road surfaces is approximately:

* Victoria County Roads Board Annual Report, year ended June 30, 1932.
It is obvious that a reduction of tractive effort will decrease fuel consumption, and, in addition, that the better surfaces will reduce tyre wear, permit a higher daily mileage, and reduce depreciation costs by adding to the life of the vehicle. It is not easy to place a value on these benefits, but the Main Roads Board, of New South Wales, who operate a large fleet of cars and trucks, have been able to make a comparison of the costs of vehicle operation according to the class of road used, and the conclusion was reached that operating on bad roads cost at least 1½d more per vehicle-mile travelled.

Careful estimates have also been made in America by Professor T. R. Agg, of the Iowa State College,* and Mr. John A. Johnson, District Engineer, Massachusetts Highways Department,† from the operating costs of transport undertakings over different types of road-way. Professor Agg reached the conclusion that a change from a lower type to a higher type of road surface resulted in a saving of one-eighth of the operating costs on the lower type. Mr. Johnson estimated that the operating costs over different types of roadway from records of Massachusetts vehicle users in cents per mile were as follows:–

<table>
<thead>
<tr>
<th>Type of Road</th>
<th>High</th>
<th>Intermediate</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger cars</td>
<td>8×02</td>
<td>9×14</td>
<td>11×56</td>
</tr>
<tr>
<td>Trucks to 1½ tons</td>
<td>11×86</td>
<td>13×88</td>
<td>18×47</td>
</tr>
<tr>
<td>Trucks from 1½ to 3 tons</td>
<td>20×83</td>
<td>24×41</td>
<td>31×05</td>
</tr>
<tr>
<td>Trucks and buses over 3½ tons</td>
<td>31×56</td>
<td>36×97</td>
<td>46×08</td>
</tr>
</tbody>
</table>

The high-type roads were those with a firm, true surface of bitumen, Portland cement mixtures, or blocks in good condition. The intermediate types were plain gravel or water-bound macadam in fair condition. The low types were natural local soil with no surface treatment.

From the above figures it would appear that the cost of operation on earth roads is greater than on macadam roads to the extent of / nearly 2 ½ cents per vehicle mile for passenger cars and over 4 ½ cents per vehicle mile for light lorries. These figures, it must be remembered, are applicable in America, where the cost of cars, accessories, motor spirit, etc., is less than in any other country in the world, and the savings in operating costs due to good roads are likely to be greater elsewhere.

* Engineering News-Record, Vol. 111 (1933), p. 5; and Bulletin 91, Engineering Experiment Station, Iowa State College, 1928.
The above figures are enlightening, and show what a small amount of traffic suffices to justify a good road if the cost of operation is given adequate consideration. In Nigeria it costs £850 a mile more to provide a road with stone metalling and bitumen surfacing than it does to build an earth road. If interest and sinking fund charges are taken at 6 per cent. on the additional cost of constructing the superior type of road surface, the annual charges amount to £51 or 12,240d. Assuming a saving of only 1d. per vehicle mile, a traffic of 34 vehicles a day would suffice to justify the superior type of road. Facts such as these prompted Mr. Thomas H. Macdonald, the Chief of the Bureau of Public Roads, U.S.A., to remark, ‘We pay for good roads whether we have them or not, and we pay less for them if we have them not’.

**Cost of Motor Transport.**

The cost of motor transport will vary widely according to the remoteness of the district from the source of supplies. In some parts of Central Africa petrol costs 7s. 6d. per gallon, while cars and accessories are also expensive.

Apart from the privately-owned car, a considerable measure of competition in the provision of transport facilities will be found in most colonies. In some instances the Government itself owns and operates a large fleet of vehicles, usually as feeders to the State railway system, but occasionally to undertake general haulage work for its own departments. In many districts, too, substantial firms, with European managers, operate transport services, while the native-owned and driven bus and lorry will be found almost everywhere.

Whether a motor service is Government-owned or operated by a firm of substance, it must be conducted on sound economic lines, and its charges must take into account the cost of interest on capital expenditure, depreciation, etc. It must, in addition, pay adequate wages to its staff, provide garages, repair shops, etc., so that its fleet of vehicles can be kept in sound running order. The native bus owner has no overhead charges, the roadside is his garage and the bus is his home. He is willing to work very long hours, and is satisfied if he obtains a bare living from his enterprise. The amount of capital required is small, as wooden seats on a Ford chassis with a timber framework supporting an awning with curtains suffices, and he is generally able to obtain his vehicle on the hire-purchase system by an initial payment of £20. It will be realized how difficult it is for a large motor transport organization operated on sound business principles to compete successfully with a large number of small independent enterprises conducted on uneconomic lines.

It has been said that the cost of motor transport varies widely, but a few examples will be quoted of operating costs which have been published in certain countries.
The Nigerian Railway Department operates a fleet of vehicles providing feeder services to the railway, and in the year ended the 31st March, 1933, the vehicles ran 244,434 miles and carried 3,275 passengers and 11,935 tons of goods. The net loaded or goods ton-miles run were 537,000, at an average cost of 6×18d. per ton-mile, exclusive of interest and renewal charges.

The Kenya and Uganda Railway also operates motor services in the neighbourhood of the Great Lakes, which in 1932 carried 11,204 passengers and 10,074 tons of goods. The average load per lorry-mile was 1×88 tons, and the total ton-miles run were 616,057, at an average cost of 6d. per ton-mile, including depreciation.

The Oversea Mechanical Transport Committee,² appointed in 1928 by the Secretary of State for Dominion Affairs and for the Colonies, has designed a special unit for operation over earth roads. It consists of an 8-wheeled tractor and two 8-wheeled trailers, the tractor carrying a paying load of 3 tons and the trailers of 6 tons each. The unit has been operated over the 240 miles between Kumasi and Tamale in the Gold Coast, and has proved easy to drive and manœuvre. The useful load carried has averaged less than 10 tons, and after making generous allowances for interest, depreciation, repairs, maintenance and supervision the all-in cost of transport has worked out at 5½d. per ton-mile.

The Uganda Public Works Department operates a fleet of cars and lorries for transport purposes, and in 1931 the lorry mileage run was 718,508 miles. The total all-in cost, including depreciation, insurance, etc., amounted to 10½d. per lorry mile. Road motor services are also operated by responsible firms in Uganda at rates approximating to 1s. per ton-mile, but in a number of cases irresponsible competition is carried on at rates as low as from 7d. to 9d. per ton-mile.

In Tanganyika well-established transport companies run regular services of lorries for the transport of passengers, mails, produce, etc., over long distances in districts not provided with railways at charges which vary from 1s. to 2s. per ton-mile. A difference is made in the rates charged according to the season, the rate being less in the dry season, while the highest rates are for the most remote districts. Where competitive with the railway, motor-lorry rates vary from 8d. to 1s. 4d. per ton-mile.

It will be seen from the foregoing that in new countries a motor-transport service run on sound commercial lines is likely to cost at least 6d. per ton-mile, and in remote districts far removed from sources of supply, the cost may amount to 1s. or more per ton-mile. Where there is no railway competition the cost to the public is likely to be at least 1s., and may be considerably more per ton-mile. By means of excessive over-loading native-owned lorries can operate at less than 6d. per ton-mile, while low rates are sometimes quoted in cases where vehicles would otherwise return empty. It is, however, doubtful if road transport can be

* Described in The Engineer, 21 July 1933, p. 55.
operated in the colonies on economic lines at less than 6d. per ton-mile, particularly over earth roads.

**Cost of Rail Transport.**

The charge for motor transport bears a close relation to the cost of service, but this is not so with rail transport. A railway is a ‘common carrier’, and as such is compelled to provide facilities for transporting all kinds of traffic. The greater part of its freight consists of commodities which can only afford to pay low rates, and to compensate for this it has been the practice on all railways to charge for valuable goods, not on the cost of service, but on what it was estimated the traffic would bear. In this way the highly rated freight – which is only a small proportion of the total tonnage transported – bears the greater part, if not the whole, of the overhead costs of the railway, and the low-rated freight is freed from its share of overhead charges. This principle of rating is known as ‘charging what the traffic will bear’, and the late Sir William M. Acworth comments upon it as follows:–

‘This, in principle and outline, is the system of charging what the traffic will bear. It is the system which – the point must be reiterated – is, always has been, and, as far as we can see, always will be adopted on all railways, whether they be State enterprises or private undertakings’.

[...] [As regards] the rate structure of the Kenya and Uganda railway. The various commodities transported are separated into ten different classes, each of which pays a different rate. In addition there are ‘special rates’ and ‘export rates’. /

The charge made for a commodity in Class 1 is from nine to fourteen times that made for a commodity in Class 10, although the actual cost of transport may be the same. It is difficult, therefore, to make any useful comparison between road transport rates and railway rates, but what is of vital importance is the relative cost of movement by railway and by road. It has been shown that road transport costs at least 6d. per ton-mile under favourable circumstances, and may cost 1s. per ton-mile or more in remote districts where there is no competition. These figures represent the actual cost of moving commodities by road. On a railway the cost of movement is the average rate paid per ton-mile, which on certain colonial railways in 1932 was as under:–

<table>
<thead>
<tr>
<th>Railway</th>
<th>Rate per ton-mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federated Malay States Railway</td>
<td>1×37 Pence.</td>
</tr>
<tr>
<td>Nigerian Railway</td>
<td>1×72 &quot;</td>
</tr>
<tr>
<td>Kenya and Uganda Railway</td>
<td>1×46 &quot;</td>
</tr>
<tr>
<td>Tanganyika Railway</td>
<td>2×00 &quot;</td>
</tr>
</tbody>
</table>

These average rates were not entirely economic, as in 1932 the net revenues of railways concerned were inadequate to meet the whole of their interest and

depreciation charges. In more prosperous years revenue probably would have been adequate, and it can be fairly assumed that the cost of movement by rail is certainly not more than one-third of the cost of movement by road. / 

Comparisons between Rail and Road Transport.

It will be seen from the foregoing that railway construction in the colonies, even in favourable circumstances, is likely to cost from £3,000 to £5,000 per mile, while an earth road can be built for about £300 per mile. The cost of transport on the road is, however, likely to be at least three times as great as on the railway, and a rail service will be more economical than a road service if the amount of traffic to be transported is sufficient to make the saving on operating expenses justify the cost of constructing and equipping a railway. Whether a railway or a road should be built in new areas where no transport facilities exist will depend primarily on the volume of traffic which is likely to make use of the facilities provided, but roads possess the advantage of allowing the expense of construction and maintenance to be made proportionate to the importance of traffic served where the volume of traffic is small. Roads can be constructed to carry light vehicles, including motor lorries, at much less cost than any type of railway. Owing to the ability of the motor truck to operate on gradients and curves more severe than would be possible on a railway the cost of formation and grading is much less, while the cost of surfacing for a limited amount of traffic would also be less than that of the permanent way of a railway.

Some indication of the classes of traffic which are more suitable for rail transport and of those which can be more conveniently handled by road will be obtained by studying the effects of road competition on railway traffics in districts where roads and railways are in active competition. Since the competitive effect of motor transport is felt most with short hauls, examples of countries of small area will be considered first.

The island of Mauritius is approximately 39 miles long by 27 miles wide, rising to a height of 2,000 feet in the centre, and has a population of 410,000. It possesses a considerable mileage of excellent roads, which run parallel to the railway in many places and short-circuit it at others. Owing to the hilly nature of the island it was necessary, when building the railway, to introduce many severe grades and sharp curves, so that the railway is difficult to operate. These facts establish ideal conditions for road traffic, and during the last ten years the railway has suffered severely from road competition. The island is largely dependent for prosperity on its sugar crop, and, with the exception of the year 1931, when the sugar plantations were badly damaged by a hurricane, the tonnage of sugar produced has not varied to a wider extent in recent years than would be anticipated for a product of the soil. But for the competition of road transport it can be assumed that railway revenue would not have varied widely.
Railway revenue, from the peak year 1923–24 to the 30th June, 1933, [fell] [...] and it would be difficult to present a more depressing picture of the effects of road competition, passenger receipts having fallen to about one-seventh of their value in 1923–24. The island's sugar crop and the tonnages of goods conveyed on the railway during the period from 1923–24 to 1932–33 are shown in Table I; the figures for 1931–32 were adversely affected by the hurricane.

### Table I – Mauritius Railway.

<table>
<thead>
<tr>
<th>Year</th>
<th>Island’s sugar crop: tons.</th>
<th>Sugar-canes: tons.</th>
<th>Sugar: tons.</th>
<th>Other commodities: tons</th>
<th>Total: tons.</th>
<th>Total of sugar and other commodities: tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1923–24</td>
<td>201,550</td>
<td>150,621</td>
<td>156,371</td>
<td>187,716</td>
<td>494,708</td>
<td>344,087</td>
</tr>
<tr>
<td>1924–25</td>
<td>224,710</td>
<td>161,505</td>
<td>198,701</td>
<td>189,834</td>
<td>550,040</td>
<td>388,535</td>
</tr>
<tr>
<td>1925–26</td>
<td>239,106</td>
<td>176,453</td>
<td>200,865</td>
<td>164,978</td>
<td>542,296</td>
<td>365,843</td>
</tr>
<tr>
<td>1926–27</td>
<td>190,712</td>
<td>126,732</td>
<td>161,316</td>
<td>173,073</td>
<td>487,279</td>
<td>360,547</td>
</tr>
<tr>
<td>1927–28</td>
<td>214,627</td>
<td>99,340</td>
<td>186,255</td>
<td>194,833</td>
<td>480,428</td>
<td>381,088</td>
</tr>
<tr>
<td>1928–29</td>
<td>250,094</td>
<td>100,384</td>
<td>206,198</td>
<td>132,331</td>
<td>438,913</td>
<td>338,529</td>
</tr>
<tr>
<td>1929–30</td>
<td>234,015</td>
<td>75,029</td>
<td>192,528</td>
<td>121,521</td>
<td>389,078</td>
<td>314,049</td>
</tr>
<tr>
<td>1930–31</td>
<td>220,096</td>
<td>68,551</td>
<td>181,487</td>
<td>84,386</td>
<td>334,424</td>
<td>265,873</td>
</tr>
<tr>
<td>1931–32</td>
<td>164,010</td>
<td>48,074</td>
<td>124,483</td>
<td>71,724</td>
<td>244,281</td>
<td>196,207</td>
</tr>
</tbody>
</table>
| 1932–33  | 247,000                     | 63,389             | 207,933      | 73,346                  | 348,668      | 265,279 /

The large reduction in the tonnage of sugar-canes is due to the plantations laying down their own systems of light railways for conveying canes from the fields to the factories, so that the loss of sugar-cane traffic cannot be ascribed to road transport. Of the remainder of its goods traffic (‘Sugar and other commodities’) the railway had retained 83 per cent., showing that in spite of conditions particularly favourable to road transport the island is dependent on its railway for the greater portion of its transport services.

[...]

The Gold Coast, including Ashanti, the Northern Territories and Togoland, has an area of 91,843 square miles with a population of 3,124,202, and railways run from Accra and Sekondi on the coast to the interior. Road competition first began to be felt in 1924–25, and although the number of passengers carried in 1930–31 was approximately the same as in 1924–25, the receipts were about 8 per cent. less, while passenger train-miles run were more than double. Road competition, therefore, had the effect of compelling the railway to augment the local services in order to retain its passenger traffic, and thus of reducing its net earnings from this source.

The railway has, moreover, lost much of its freight traffic. The average export of cacao from Accra for the five years 1927–31 was 96,500 tons, of which the railway in 1924–25 carried approximately 95 per cent., but only 53 per cent. in
1931. Thus in six years there was a fall of over 40,000 tons in cacao freight alone as the result of road competition. In order to retain its traffic the railway has made successive reductions in rates, and the following figures show the modifications which have been made to the rates charged on spirits and cacao between Accra and the more important stations on the Accra-Kumasi line:– /

<table>
<thead>
<tr>
<th>Station</th>
<th>Distance</th>
<th>Spirits: rate per ton.</th>
<th>1923.</th>
<th>1929.</th>
<th>1931.</th>
<th>1931. Rate per ton-mile.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nkawkaw</td>
<td>110 miles</td>
<td>195/10</td>
<td>62/6</td>
<td>50/–</td>
<td>5×45 Pence</td>
<td></td>
</tr>
<tr>
<td>Ayinam</td>
<td>86 &quot;</td>
<td>170/–</td>
<td>53/8</td>
<td>35/–</td>
<td>4×88 &quot;</td>
<td></td>
</tr>
<tr>
<td>Tafo</td>
<td>65 &quot;</td>
<td>125/–</td>
<td>37/11</td>
<td>25/–</td>
<td>4×62 &quot;</td>
<td></td>
</tr>
<tr>
<td>Koforidua</td>
<td>52 &quot;</td>
<td>103/4</td>
<td>30/4</td>
<td>18/6</td>
<td>4×27 &quot;</td>
<td></td>
</tr>
<tr>
<td>Nsawam</td>
<td>27 &quot;</td>
<td>54/–</td>
<td>15/9</td>
<td>8/–</td>
<td>3×55 &quot;</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Station</th>
<th>Distance</th>
<th>Cacao: rate per ton.</th>
<th>1923.</th>
<th>1927.</th>
<th>1931.</th>
<th>1931. Rate per ton-mile.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nkawkaw</td>
<td>110 miles</td>
<td>76/8</td>
<td>65/–</td>
<td>50/–</td>
<td>5×45 Pence</td>
<td></td>
</tr>
<tr>
<td>Ayinam</td>
<td>86 &quot;</td>
<td>61/6</td>
<td>41/–</td>
<td>35/–</td>
<td>4×88 &quot;</td>
<td></td>
</tr>
<tr>
<td>Tafo</td>
<td>65 &quot;</td>
<td>47/6</td>
<td>35/6</td>
<td>25/–</td>
<td>4×62 &quot;</td>
<td></td>
</tr>
<tr>
<td>Koforidua</td>
<td>52 &quot;</td>
<td>38/10</td>
<td>27/–</td>
<td>18/6</td>
<td>4×27 &quot;</td>
<td></td>
</tr>
<tr>
<td>Nsawam</td>
<td>27 &quot;</td>
<td>15/–</td>
<td>9/–</td>
<td>8/–</td>
<td>3×55 &quot;</td>
<td></td>
</tr>
</tbody>
</table>

The ton-mile figures indicate a new policy in railway rating, since the rates are less per ton-mile for short distances than for long distances, whereas in the past it has been usual for railways to reduce their ton-mile rates as the length of haul increased. The motor lorry is, however, more competitive over short distances and the railway rates have been modified accordingly. The effect of motor competition has been, in fact, to modify in principle the rates policy of the railway, and the alteration, though sound from the railway point of view, is difficult to justify, as it penalises districts remote from the coast which are most in need of cheap transport.

Some of the stations on the Central Province railway have more direct access by road to the coastal ports of Winnebah, Saltponds and Cape Coast Castle than by rail to Takoradi Harbour, and road transport is in consequence favourably placed to handle the traffic offering. Railway rates for cacao and goods have in consequence been reduced to less than 3d., and in some cases to less than 2d. per ton-mile from stations on the Central Province railway to Takoradi. Examples of existing rates are given below:– /

<table>
<thead>
<tr>
<th>Station</th>
<th>Distance</th>
<th>Cacao: rate per ton.</th>
<th>Goods: rate per ton.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>per ton.</td>
<td>per ton-mile.</td>
</tr>
<tr>
<td>Kade</td>
<td>156 miles</td>
<td>28/– 2.0 Pence</td>
<td>30/– 2.3 Pence</td>
</tr>
<tr>
<td>Oda</td>
<td>138 &quot;</td>
<td>20/– 1073 &quot;</td>
<td>22/– 1.9 &quot;</td>
</tr>
<tr>
<td>Achiasi</td>
<td>133 &quot;</td>
<td>18/– 1.62 &quot;</td>
<td>20/– 1.8 &quot;</td>
</tr>
<tr>
<td>Foso</td>
<td>108 &quot;</td>
<td>18/– 2.0 &quot;</td>
<td>20/– 2.2 &quot;</td>
</tr>
<tr>
<td>Twifu</td>
<td>87 &quot;</td>
<td>18/– 2.5 &quot;</td>
<td>20/– 2.75 &quot;</td>
</tr>
</tbody>
</table>
Even with these low rates the railway is unable to secure the bulk of the traffic, although it must be remembered that the length of haul by road is less than by rail.

Nigeria has an area of 373,078 square miles, or a little less than the combined areas of the United Kingdom, France and Belgium. Its population is about 19½ millions, and the mileage of its railways is 1,905 miles; N’Guru, the most remote station, being 845 miles from Lagos on the coast. In so large a country it will be realized that road competition cannot be so effective as in small islands like Mauritius and Trinidad. This will be more readily appreciated when it is stated that the average length of haul of goods traffic in Nigeria is 358 miles. The revenue of the railway over the ten-year period, 1923 to 1932, is shown in Table III.

Table III – Nigerian Railway Statement of Receipts.
1923–24 to 1932–33

<table>
<thead>
<tr>
<th>Year</th>
<th>Mileage</th>
<th>Passenger: £</th>
<th>Goods: £</th>
<th>Telegraph: £</th>
<th>Sundries and motors: £</th>
<th>Total: £</th>
</tr>
</thead>
<tbody>
<tr>
<td>1923–24</td>
<td>1,126</td>
<td>299,688</td>
<td>1,308,537</td>
<td>2,794</td>
<td>42,096</td>
<td>1,653,115</td>
</tr>
<tr>
<td>1924–25</td>
<td>1,220</td>
<td>290,639</td>
<td>1,736,194</td>
<td>3,054</td>
<td>46,704</td>
<td>2,076,591</td>
</tr>
<tr>
<td>1925–26</td>
<td>1,265</td>
<td>308,675</td>
<td>2,019,094</td>
<td>3,347</td>
<td>46,192</td>
<td>2,377,308</td>
</tr>
<tr>
<td>1926–27</td>
<td>1,265</td>
<td>321,763</td>
<td>2,046,228</td>
<td>3,576</td>
<td>48,589</td>
<td>2,420,156</td>
</tr>
<tr>
<td>1927–28</td>
<td>1,597</td>
<td>365,623</td>
<td>2,045,710</td>
<td>4,045</td>
<td>39,713</td>
<td>2,455,091</td>
</tr>
<tr>
<td>1928–29</td>
<td>1,625</td>
<td>393,620</td>
<td>2,093,443</td>
<td>4,063</td>
<td>61,536</td>
<td>2,552,662</td>
</tr>
<tr>
<td>1929–30</td>
<td>1,744</td>
<td>398,490</td>
<td>2,220,754</td>
<td>3,910</td>
<td>93,092</td>
<td>2,716,246</td>
</tr>
<tr>
<td>1930–31</td>
<td>1,851</td>
<td>350,548</td>
<td>1,758,403</td>
<td>3,459</td>
<td>65,846</td>
<td>2,178,256</td>
</tr>
<tr>
<td>1931–32</td>
<td>1,905</td>
<td>253,527</td>
<td>1,548,100</td>
<td>2,971</td>
<td>51,286</td>
<td>1,855,884</td>
</tr>
<tr>
<td>1932–33</td>
<td>1,905</td>
<td>217,583</td>
<td>1,611,964</td>
<td>2,576</td>
<td>53,581</td>
<td>1,885,704</td>
</tr>
</tbody>
</table>

It will be seen that peak conditions occurred in 1929–30, since when passenger receipts have fallen by 46 per cent. and goods receipts by 27 per cent. in spite of a 10 per cent. increase in mileage. It is not possible to say how much of this reduction is due to road competition and how much to the general economic depression from which Nigeria – like the rest of the world – is suffering, but it would certainly seem that passenger receipts are suffering to a greater extent than goods receipts. Passenger receipts were considerably less in 1932–33 than in 1923–24, although the mileage of line open had increased from 1,126 to 1,905 miles. On the other hand, goods receipts increased by 23 per cent. in the same period. During the four-year period, 1925–26 to 1928–29, goods receipts remained fairly constant, but passenger receipts increased substantially, and up to the peak year – 1929–30 – the railway revenue did not suffer seriously from road competition, owing largely to the lack of suitable roads. Extensive road construction has been carried out in recent years, and a part of the loss of revenue since 1929–30 has undoubtedly been due to road competition, but with an average length of haul of 358 miles and an average passenger journey of 29 miles the particular advantages of motor transport have not the same importance as with short hauls.
In order to compete more effectively with motor transport the rates classification was altered in 1931, the highest rate being abolished and many commodities included under the lower classes being absorbed in the lower classes. Special rates for wagon loads of imports were introduced and have achieved considerable success in regaining short-distance traffic from the roads. Mixed consignments of imports with a minimum weight of 5 tons are accepted, and carried at a rate of 1½d. per ton-mile, irrespective of the classification of goods with which the wagon is loaded. For each consignment note, a voucher is issued entitling the owner to load for conveyance to the coast an equal tonnage of produce at a special low rate of 2½d. per ton-mile. With balanced traffic in each direction, the railway earn on the round trip 2d. per ton-mile. Any produce carried in excess of tonnage shown on the vouchers goes at ordinary class rates. This scheme was devised to circumvent motor transport selecting the higher-rated import traffic, whereby they were enabled to undercut the railway class rates on produce for export, and because the total tonnage of export produce cannot be evacuated by road under existing conditions. During the year 1932–33, 14,795 tons of imports and 13,070 tons of exports were carried under these conditions, and the revenue earned was £32,267, while the number of lorries plying for hire for goods transport was reduced.

The rate for ground nuts from Zaria and stations to the north to the coast was fixed at 80s. per ton. During 1932–33, 9,080 tons / were forwarded from N’Guru to the coast – 845 miles – at the above rate, which is slightly under 1.2d. per ton-mile, including handling charges and 14 days’ free storage at the port. To be profitable to the railway the rate should be at least 50 per cent. higher, or 120s. per ton. If to this is added the cost of bags, ocean freight, insurance, agents’ fees and commission, etc., the cost of transport from N’Guru to England would amount to at least £8 per ton. The selling price of ground nuts in England to-day (November, 1933) is £9 6s. 3d. per ton, and it is clear that with ground nuts at their present price the farmer or the railway must go profitless.

In 1932–33, 585,685 tons of goods were carried by the Nigerian railway, the tonnages of the principal commodities being as follows: –

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural products</td>
<td>24,856</td>
</tr>
<tr>
<td>Building materials</td>
<td>10,066</td>
</tr>
<tr>
<td>Cocoa</td>
<td>20,396</td>
</tr>
<tr>
<td>Coal</td>
<td>107,132</td>
</tr>
<tr>
<td>Ground nuts</td>
<td>198,032</td>
</tr>
<tr>
<td>Kola nuts</td>
<td>12,686</td>
</tr>
<tr>
<td>Palm kernels</td>
<td>55,893</td>
</tr>
<tr>
<td>Palm oil</td>
<td>29,802</td>
</tr>
<tr>
<td>Salt</td>
<td>22,175</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>481,038</td>
</tr>
</tbody>
</table>
The above commodities, which cannot afford high transport rates, comprise about 82 per cent. of the total railway tonnage.

The Colony and Protectorate of Kenya have an area of about 224,960 square miles and a population of a little over three millions. While, therefore, the area is about three-fifths of that of Nigeria the population is less than one-sixth. The revenue of the Kenya and Uganda railway over the ten-year period 1923 to 1932 is shown in Table IV.

Table IV. – Kenya and Uganda Railway.
Revenue Statement from 1923 to 1932.

<table>
<thead>
<tr>
<th>Year</th>
<th>Mileage</th>
<th>Passenger: £</th>
<th>Parcels: £</th>
<th>Live stock: £</th>
<th>Goods: £</th>
<th>Miscellaneous: £</th>
<th>Total: £</th>
</tr>
</thead>
<tbody>
<tr>
<td>1923</td>
<td>692</td>
<td>171,361</td>
<td>39,581</td>
<td>7,018</td>
<td>965,956</td>
<td>53,820</td>
<td>1,237,736</td>
</tr>
<tr>
<td>1924</td>
<td>816</td>
<td>199,500</td>
<td>46,939</td>
<td>10,872</td>
<td>1,313,906</td>
<td>66,032</td>
<td>1,635,189</td>
</tr>
<tr>
<td>1925</td>
<td>898</td>
<td>227,272</td>
<td>53,426</td>
<td>10,872</td>
<td>1,616,765</td>
<td>85,174</td>
<td>1,993,509</td>
</tr>
<tr>
<td>1926</td>
<td>998</td>
<td>256,918</td>
<td>51,084</td>
<td>10,992</td>
<td>1,634,700</td>
<td>105,017</td>
<td>2,058,711</td>
</tr>
<tr>
<td>1927</td>
<td>1,166</td>
<td>266,326</td>
<td>49,404</td>
<td>13,396</td>
<td>1,737,852</td>
<td>59,065</td>
<td>2,125,043</td>
</tr>
<tr>
<td>1928</td>
<td>1,135</td>
<td>284,750</td>
<td>55,456</td>
<td>14,412</td>
<td>1,895,755</td>
<td>64,057</td>
<td>2,314,430</td>
</tr>
<tr>
<td>1929</td>
<td>1,426</td>
<td>293,688</td>
<td>54,670</td>
<td>18,914</td>
<td>2,016,455</td>
<td>65,230</td>
<td>2,448,960</td>
</tr>
<tr>
<td>1930</td>
<td>1,521</td>
<td>287,779</td>
<td>53,369</td>
<td>22,315</td>
<td>1,785,518</td>
<td>65,248</td>
<td>2,214,229</td>
</tr>
<tr>
<td>1931</td>
<td>1,616</td>
<td>217,380</td>
<td>43,911</td>
<td>19,935</td>
<td>1,570,338</td>
<td>52,162</td>
<td>1,903,726</td>
</tr>
<tr>
<td>1932</td>
<td>1,627</td>
<td>170,460</td>
<td>36,636</td>
<td>16,892</td>
<td>1,564,966</td>
<td>49,707</td>
<td>1,838,661</td>
</tr>
</tbody>
</table>

It will be noted that the passenger receipts in 1932 were less than in 1923, although the mileage of line open to traffic had increased from 692 to 1,627 miles. In the same period goods receipts increased from £965,956 to £1,564,966, or by 62 per cent. The peak year for both passengers and goods was in 1929 – the same year as in Nigeria – and there has been a successive fall each year since, the passenger receipts having fallen to 58 per cent, and the goods revenue to 78 per cent. of the 1929 figures. Between the years 1928 and 1932 the number of passengers fell by 49 per cent., but the coaching revenue was only 40 per cent. less, which shows that the greatest loss was in short-distance passengers, that being the traffic which is most susceptible to bus competition. The goods revenue in the same period fell by 16 per cent. The substantial loss in revenue during the last three years is due principally to the world-wide economic depression, but it was estimated that the loss during 1931 due to road competition must have amounted to £70,000 at least, and may have reached an even higher figure. The tonnages carried at the various class rates in 1932, the highest rate being Class 1, were as follows:–
Communications in Africa, 1880–1939: Volume 4

Class | Rate | Tons.
------|------|------
1     |      | 8,517
2     |      | 3,595
3     |      | 27,646
4     |      | 4,516
5     |      | 11,563
6     |      | 58,819 = 8 per cent.
7     |      | 30,833
8     |      | 74,681
9     |      | 101,057
10    |      | 102,422

Exceptional rates | Tons. | 206,069 = 31 per cent.
Export | Tons. | 200,058

Total | Tons. | 664,634 = 92 per cent.

[...] class rates 1 to 3 exceed 6d. per ton-mile, and class rates 1 to 6 exceed 3d. per ton-mile, but in 1932 only 2 per cent. of the total goods tonnage was carried at the / three highest rates and only 8 per cent. of the total goods tonnage at the six highest rates. While only 2 per cent. of the goods tonnage is carried in the three top classes these classes, only a few years ago, contributed 25 per cent. of the total goods revenue, and it will be seen that road competition can seriously reduce the railway’s revenue, even though a very small percentage only of its traffic is carried by motors. The 92 per cent. of the traffic which is carried by rail at less than 3d. per ton-mile should not be susceptible to road competition, but a portion of it is doubtless short-haul traffic in small lots where the convenience of door-to-door delivery justifies transport by road at higher rates. In 1932 the tonnage carried in Classes 1, 2 and 3 was 30 per cent. less than in 1930. Over one-third of the total tonnage was carried at ‘Export’ rates, which are the lowest rates. A noticeable feature of Table IV is the large increase in the mileage of lines open to traffic between the years 1923 and 1932, and the figures in Table V will show how development has followed the increase in transport facilities which the railway has provided.

Table V. – Kenya and Uganda Railway.

Growth of low-rated traffic.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1922</td>
<td>19,856</td>
<td>2,520</td>
<td>27</td>
<td>22,403</td>
</tr>
<tr>
<td>1923</td>
<td>43,735</td>
<td>10,014</td>
<td>9</td>
<td>53,758</td>
</tr>
<tr>
<td>1924</td>
<td>59,336</td>
<td>21,155</td>
<td>92</td>
<td>80,583</td>
</tr>
<tr>
<td>1925</td>
<td>61,238</td>
<td>22,309</td>
<td>29</td>
<td>83,576</td>
</tr>
<tr>
<td>1926</td>
<td>46,499</td>
<td>35,563</td>
<td>3</td>
<td>82,065</td>
</tr>
<tr>
<td>1927</td>
<td>89,383</td>
<td>29,957</td>
<td>16</td>
<td>119,340</td>
</tr>
<tr>
<td>1928</td>
<td>44,648</td>
<td>45,845</td>
<td>6,838</td>
<td>97,331</td>
</tr>
</tbody>
</table>
In these three commodities alone the tonnage carried by railway increased between 1922 and 1930 from 22,403 to 166,462 tons, while the ton-mileage rose from 10.8 millions to 97.2 millions. The average lengths of haul of the three commodities in 1930 were:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>40,185</td>
<td>68,069</td>
<td>3,267</td>
<td>111,521</td>
</tr>
<tr>
<td>1930</td>
<td>119,766</td>
<td>35,910</td>
<td>10,786</td>
<td>166,462</td>
</tr>
<tr>
<td>1931</td>
<td>94,315</td>
<td>49,610</td>
<td>3,134</td>
<td>147,059</td>
</tr>
<tr>
<td>1932</td>
<td>34,510</td>
<td>59,482</td>
<td>11</td>
<td>94,003</td>
</tr>
</tbody>
</table>

These commodities are carried at export rates which for maize and wheat are, in the case of the longest distances, only a farthing per ton-mile. The low cost of carriage in conjunction with the long lead is only possible with rail transport, and proves conclusively that the extensive development which has taken place in the last ten years was only rendered possible by the growth of the railway system.

If Tables III and IV are compared the following points of similarity will be noticed:

(a) A large mileage of new lines was added in the ten-year period.

(b) In spite of the new mileage, passenger receipts were less in 1932 than in 1923.

(c) Although passenger receipts were less, goods receipts increased substantially.

Certain conclusions of a fairly definite character can be drawn from the foregoing. It would appear that drastic reductions of third-class passenger fares will induce travellers to forsake the roads for the railway, but it is doubtful if any appreciable increase in net revenue results therefrom. Moreover, a reduction of railway fares is generally followed by a reduction of bus fares, which makes it doubtful if the railway would permanently retain all the traffic recovered. For short distances the frequency and flexibility of a motor-bus service give it a great advantage over a local railway passenger service. It passes through villages, picks up the passenger at his door and drops him wherever he wishes. Railways, on the other hand, are often remote from the village centres and cannot stop to pick up and set down passengers as often as a bus can. Moreover, a railway cannot provide so frequent a service, especially where, as is usual on colonial railways, the line is of single track. Where roads run parallel to railways it is clear that railways cannot cater for short-distance traffic so satisfactorily as road services; the first-class passenger will travel by private car and the third-class passenger by bus. It should be recognized that the convenience of the community can be better
served by road services. For long journeys a railway provides greater comfort, is less tedious, and possesses distinct advantages over motor transport, particularly where the journey involves the use of restaurant and sleeping cars.

With regard to high-rated goods traffic, motors possess the great advantage that they can in many instances include the collection, transport and delivery of commodities in a single journey and for a single rate. For short journeys the savings effected in time, cost, breakages, and so on, by the elimination of one or two handleds will always give an advantage to the motor, even though the railway / rate may be lower, but this advantage will be reduced as the length of the journey increases. Moreover, it is customary for railway rates per ton-mile to fall as the distance increases, so that the longer the haul the more difficult it is for motor transport to compete economically with rail transport, even for commodities which are included in the higher classes of railway rates. There is, in fact, a certain distance in every country over which a motor can be more economically employed for the highly-rated traffic, but this distance will vary with the character and volume of the commodity, the extent of rehandling and importance of direct delivery, the condition of the roads, gradients, etc. In British Colonies and Protectorates this distance would appear to be from 60 to 100 miles.

With respect to the lowly-rated traffic, road transport is unable to compete economically with the railway even over short distances. In islands of small areas, like Mauritius and Trinidad, it has been shown that 80 per cent. of the goods traffic is not susceptible to road competition, while in countries of large area, like Kenya and Nigeria, the percentage is considerably greater. In spite, therefore, of unrestricted road competition the railways are still providing the bulk of the transport services in the colonies.

Privileged Character of Road Transport.

When considering the effects of road competition it should not be overlooked that road services enjoy privileges which are denied to railways. A road transport undertaking is not a ‘common carrier’, and so can refuse to carry unprofitable traffic. It need not publish its rates and can quote different rates to different customers. It can pick and choose what traffic it will transport and does, in fact, take from the railway only the higher-rated commodities, leaving the railway the obligation of carrying the heavy bulk freight at unprofitable rates. Further, railway rates cover the whole cost of the service, including the cost of maintenance of permanent way, bridges, equipment, etc., but road transport charges do not generally cover the total cost of road upkeep.

Although in the past road transport has not generally paid its fair share of road upkeep, and has to this extent been, in effect, subsidised by the authority which has provided the roads, there can be little doubt that road transport can
well afford to pay the whole cost of road expenditure and still operate profitably in many districts. It would certainly be unwise to assume that increased taxation will have the effect of materially reducing road transport. / 

**Transport Regulation.**

While colonial railways are still efficiently carrying out essential transport services in amount far in excess of that dealt with by road services, their prosperity has been seriously threatened by a very privileged competitor. Road services have been subject to little, if any, regulation in the past, but if free competition between railways and roads is to be allowed in the future and railways are expected to earn sufficient net revenue to pay interest and renewal charges they must be permitted to adjust their rates so as to obtain a fair share of the highly-rated traffic, and this will mean an increase of rates on low-grade traffic to balance a reduction of rates on high-grade traffic. This constitutes an approach to a uniform rate for all kinds of traffic, and the nearer the approach the more readily will railways secure the traffic. It would, however, adversely affect export trade by preventing development, and would be contrary to the general interests of the country, including the interests of the motor transport services, as these rely principally on the carriage of imports which can only be paid for by exports. If railways are to continue to carry export traffic at uneconomic rates while high-rated traffic uses the road, it is doubtful whether they will earn sufficient net revenue to maintain their efficiency, so that some form of subsidy will be needed. The alternative is to place adequate restrictions on road traffic, in order that railways may obtain a fair share of the highly-rated traffic. Since the development and prosperity of any country is dependent upon cheap transport facilities it is desirable that any regulations introduced should not be so restrictive as to prevent the provision of transport facilities which are desirable in the public interest. Some competition may be desirable, but uncontrolled competition between road and railway is likely to result in a reduction in the efficiency of essential transport services. The native bus or lorry owner, with his low standard of living and negligible overhead costs, will, if allowed full freedom for his activities, not only take from the railway much of its most profitable traffic, but eventually drive from the roads any transport organisation which pays a fair wage for a fair day’s work, and conducts its business on sound economic principles. Unrestricted competition is by no means likely to result in the survival of the fittest.

Some measure of regulation is therefore necessary, and this should be designed so that each form of transport can be developed in its proper sphere to handle the traffic for which it is most suitable. Only by intelligent regulation can the duplication of transport services exceeding public requirements be prevented and much wasteful expenditure obviated. Where roads and railways are in active competi-
tion it is suggested that axle-loads should be limited, that motor transport taxation should at least suffice to pay a fair share of the cost of providing and maintaining the roads, and that motor lorries should operate under licence.

If the cost of road construction and maintenance is to be kept low, axle-loads should be restricted to moderate proportions, and pneumatic tyres should be insisted upon for all vehicles. Where rail transport is available for heavy loads there is no justification for costly roads to duplicate the work which the railway can do. A maximum permitted axle-load of 2 tons would cover all private cars and many types of light lorries, and should provide all necessary facilities supplementary to the railway.

If rail transport and road transport are to compete on equal terms, it is clear that road transport should bear its fair share of the cost of providing and maintaining the highways, in the same way that railway rates cover the cost of providing and maintaining the railway. The Salter Commission adopted the principle that the total annual cost of the roads should be distributed between the different categories of users according to the use enjoyed and wear and tear caused by each. In many tropical countries there is no wheeled traffic other than motor traffic, and primitive pathways are all that are needed for pedestrians and head-load transport. In such cases the whole cost of the roads is fairly chargeable to motor transport. Where transport by ox wagon or bullock cart exists, such form of transport should make some contribution to road costs, but if roads suitable for motors are provided it will generally be found that animal transport will eventually be displaced by mechanical transport, and it can be assumed that in all new countries the greater part of road expenditure is fairly chargeable to motor transport.

Where a road runs parallel to a railway motor-lorries should be prohibited on the road, except under licence. If public convenience is to be the first consideration, licence to operate should not be refused where it can be shown that the new service can provide facilities which are measurably superior to existing facilities. On the other hand, if an existing transport agency is competent to provide all the facilities that can be reasonably required, and if its efficiency would be impaired by a competing transport organization, then it is not in the public interest to grant a licence. Moreover, the interests of a country as a whole are best served, and the greatest economy will be secured, by ensuring that the largest possible volume of traffic is carried by the cheapest form of transport, this being measured not by the rates charged, but by the actual cost of movement. There can be little doubt, under colonial conditions, that most traffics are moved more cheaply by rail than by road. If the cost of the licence is high, road traffic will be limited to those commodities which are the most suitable for road transport, namely, short-distance traffic in small lots where door-to-door delivery is of importance. The State can, in fact, limit the amount of traffic using the highway by refusing to grant more than a certain number of licences.
If it is not considered expedient to limit strictly the number of lorry licences it is difficult to see how the railway revenue of pre-competitive days can be restored. Additional revenue will undoubtedly be earned when economic conditions improve, but there will still remain the loss due to the reduction of rates and fares which railway administrations have been forced to make in order to meet road competition, as well as the loss on revenue from passengers and goods which have left the railways for the highways. This must permanently affect railway revenues. The inevitable result of substituting road transport for rail transport will be an increase in the total cost of transport services. To use a means of conveyance which costs 6d. per ton-mile instead of one costing 2d. per ton-mile is not economic, and must result in a loss somewhere; and the greater the use made of the roads the greater the resulting loss. In the past the profits made on high-rated traffic were used by the railway to cover losses on low-rated traffic, but the profits on road services cannot be so used. Additional revenue will be needed to cover railway losses, and it is suggested that motor taxation should contribute towards this additional revenue. In other words, if freedom is to be granted to motor transport to take from the railway its most profitable traffic, should it not share the burden of subsidising the railway’s unprofitable traffic and pay in taxation sufficient to cover road expenditure and contribute to railway losses? In the past colonial Governments have used surplus railway earnings for developmental purposes, including road construction, and it does not appear unreasonable that transport users, with free choice of two alternative forms of transport, should be called upon to pay the cost of providing both forms of transport.

In new countries the funds available for the development of transport services are limited in amount, and it is essential, therefore, that they should be spent to the best advantage. To provide two alternative forms of transport where one will suffice is extravagant, and will delay the provision of transport facilities in areas where none exist. The ideal arrangement is that of railways for the main trunk routes with feeder roads radiating therefrom; but while it is generally agreed that new roads should be built as feeders to the railway system and not parallel thereto, this is difficult to carry out in practice. Where commodities and merchandise require movement in considerable quantities roads will, sooner or later, be found. Moreover, in the future roads will, perhaps, be provided first in districts where transport facilities do not at present exist, the railway following when development justifies its construction. While, therefore, economic development requires both roads and railways, it is not easy to make one complementary to the other.

It is clear from the foregoing that, while road services have captured the bulk of the short-distance passenger traffic, the railways, in spite of unrestricted competition, have only lost a fractional part of their goods traffic, and there can be no question that colonial prosperity is more dependent on an efficient system
of railways than on road transport. Any action which is likely to reduce railway efficiency should therefore be avoided, for railways are as essential to-day as ever, and still remain the most effective means of extending the path of civilization.

The Paper is accompanied by two blue prints, from which the figures in the text have been prepared.

Discussion.

[...]

Sir Henry Fowler remarked that the Paper was a very good statement of the position with regard to motor transport in the Colonies and Dominions. He was himself concerned with that problem. In 1927, the Colonial Ministers who came to this country brought the matter forward, and the Government set up a Committee of which he had the honour to be Chairman, from which resulted the Oversea Mechanical Transport Committee, of which he still had the honour to be a member. The terms of reference to that Committee were, in effect, to consider what could be done by means of mechanical transport to open up undeveloped countries and to feed the railways. He felt that that was one of the points which the Author had not dealt with as fully as he might, and that was what the Committee had in mind in designing the wonderful vehicle – for he thought it was a wonderful vehicle – referred to on p. 553 of the Paper. He would like to thank the Author for the very just and fair way in which the figures of the cost per ton-mile, gained as a result of long experiments carried out in the Gold Coast, were set out in the Paper. The over-all costs were given, including interest, maintenance and renewal, and he thought that, as intended, they were really on a very conservative basis. A second vehicle had been constructed, in the design of which the Committee had benefited considerably by the experience gained with the first one, and had been fitted with a diesel engine. Although the costs of petrol had not been as high as the Author mentioned, he understood that the price taken was 7s. per gallon, which was considerably higher than that paid in the Gold Coast. A diesel engine was not fitted to the first vehicle, because the Committee felt that for development work it would be better to have an engine of which they had more experience. He would like to ask the Author whether the figures that he gave for the cost of rail transport were operating figures only, or whether they included the overhead charges of interest, depreciation, and so on. One factor which had to be borne in mind, more particularly with regard to Africa, which was the continent with which the Oversea Mechanical Transport Committee had been mainly concerned, was that railways already existed between many of the large centres of industry and production. As he had already pointed out, the object of the Committee was to try to open up undeveloped centres, and to connect them where possible with existing railways; because so
Spiller, ‘The Respective Merits of Roads and Railways for Colonial Development’ 375

far as operating costs were concerned the railway was certainly far the cheapest method of transport available at the present time. The first part of the Paper dealt principally with the question of roads. The Committee issued a monthly bulletin which, he thought the Author would agree, was of very great interest and use to those who were dealing with the question of transport abroad, and devoted much space in it to that question, which was very important for motor transport. The vehicle to which he had referred was at present operating in the Gold Coast on a road which was only a little better than an earth road. It had a facing of laterite or gravel, but it would not be regarded as a first-class road for motor transport in this country. He was a little worried to find that on p. 570 the Author suggested that the maximum laden axle-loads of road vehicles should be restricted to 2 tons. He could not think that the Author was ignorant of the fact that the rear-axle load of a 30-cwt. lorry, which was the type chiefly used in African and other colonies, was at least 2½ tons; and he felt it would be most unwise from every point of view to attempt to cut that down by half a ton. There was an engineer present who dealt with colonial bridges, and the Oversea Mechanical Transport Committee had been urging him for some time past that bridges built in future should be calculated for an axle-load of 3 tons, which Sir Henry felt was very reasonable. It had to be realized – he spoke as a railwayman – that it was not possible to drive the motors off the roads, and he felt strongly that what should be done was to make the roads to feed the railways. It was rather late to attempt it in this country, but it was not too late in the colonies. It could not be done, however, if the axle-load were cut down to 2 tons laden, which would prohibit the use of the majority of lorries now employed in the colonies.

Sir John Thornycroft said that he imagined that the object of the Paper was to endeavour to co-ordinate, and not merely to compare, the road vehicle and the railway, so that the most economical transport could be provided for the community. He felt that it was necessary to examine the basic principles even of the rate-structures as the railways used them at the present time before it could be said that one or the other was better. If a company owned a coalmine and wished to make their own mineral railway to transport the coal, they would have to charge what it cost to do so, and it seemed to him, as one who had recently had some connection with railways, that it was extraordinary that it should be assumed that the cost of transporting bulky or low-grade commodities must be met partly at the expense of the more valuable commodities which were of smaller bulk and which cost, as a rule, no more to transport. He wondered, therefore, whether it would not be better to consider the question on the basis that it cost a certain sum to transport the goods by railway and a certain sum to build, maintain and run the railway and to consider the road-vehicle in the same way. For the road-vehicle it was necessary to have some sort of road, but if the traffic-density was small a vehicle of the type to which Sir Henry Fowler had
referred could be used, which needed only a primitive road, and which would actually improve the road by being sent backwards and forwards over it. That had been proved in South Africa, where instead of building branch lines road feeder-services had been organized, on which four or five hundred vehicles had been running for some years. The route mileage of the railways of that country was about 14,000, but in the last 6 or 7 years over 10,000 miles of such feeder-services had been established, which had the same rate-structure as the railways. Many branch lines had been contemplated, but the advent of the big six-wheeled vehicle with pneumatic tires had caused road feeder-services to be adopted instead. A loss on the branch-lines was expected, but the feeder-services / began to pay after the first 2 or 3 years, and they now extended as far afield as Swaziland. The cost was rather less than the figure given in the Paper, being about 4d. per ton-mile, as petrol was fairly cheap. With road feeder-services some commodities might be carried at too high a rate on the road and too low a rate on the rail, or vice versa, but it enabled the whole community to get its goods transported to the coast or to other cities and towns where they were wanted. In South Africa, as at home, trouble had arisen from independent road competition, which was regarded as unfair; but the course suggested by the Author had been taken and legislation had been passed to prevent competitive transport by road parallel with the railway; it could only be done by license and agreement. A farmer or private owner was allowed to come in to a definite railway-station or centre, but was prohibited from working alongside the railway. The railways themselves, however, ran parallel services to get the goods where they were required. There might be 10 or 20 miles of railway-line without a station at all, and it usually happened that the railway had followed the old bullock track, so that there was some parallel working. Near the towns a certain amount of money had been spent on the roads, but not more than 10 per cent. of the 10,000 miles of route over which road feeder-services were being worked was anything better than an earth track; and there could be no doubt that, where the traffic was not above a certain density, the big pneumatic-tired vehicle improved rather than damaged the surface of the road. It was not like many tropical countries with many watercourses to be crossed, though there were some in the Drakensberg Mountains. Bridges were very few; the vehicles went through the rivers, which were only occasionally in flood. In the report of the General Manager of the South African Railways for 1933, several pages were devoted to the unfair animal competition which had arisen recently. Times were hard, so that there was a surplus of oxen and donkeys; and the General Manager said that it was most unfair and that some action must be taken; the railway, having first of all suffered from road-competition and met that by legislation, had now to suffer competition from animal transport. It seemed that more enlightenment was needed on the basic principles on which comparisons should be made.
Brigadier-General Sir H. Osborne Mance congratulated the Author on his Paper, which was the best he had ever read on the question of colonial railways and roads. The Author estimated the cost of the motor transport to be 6d. per ton-mile, and he thought it might be of interest if he quoted from some statistics he had received on the subject of motor-transport rates in Persia, where a considerable mileage was covered by road-services. There was only one rate of over 6d.; for the most part the rates were between 2d. and 4d. per ton-mile. From Mohammerah to Tehran, 748 miles, the rate was 3.7d. in one direction and 1.8d. in the other; from Bushire to Tehran it was 6.7d. in one direction and 2.7d. in the other; while across the Syrian desert, from Damascus to Bagdad, the rate in one direction was about 4½d. and in the other direction about 2¼d. Those figures showed not what the transport cost, but the rates that a native could offer, by overloading his vehicle and forgetting all about depreciation until it was too late. On p. 550 of the Paper, dealing with the economics of road surfaces, reference was made to a saving of £150 per mile per year achieved by improving the surface. He would like to point out, however, that that amount could be recovered only if a system of tolls were instituted, which was not practicable under colonial conditions, or if the operation of road transport over the improved section were a monopoly. He had recently had the honour to be the British member of an independent Committee which was asked to report to the International Chamber of Commerce\(^8\) on the question of road and rail transport. They had concluded that the main factor was not one of taxation, but was that referred to by Sir John Thornycroft, namely, the rate-structure. He cordially advised all those who wished to study the matter to read a French book\(^*\) in which the matter was dealt with very clearly. With a monopoly, the present railway rate-structure was inevitable and advantageous; without a monopoly, it was impossible. If, therefore, it was desired to maintain the present rate-structure for colonial services, it was necessary to create a monopoly, which could best be done by giving the sole right of transport parallel to the railways, except for local and feeder services, to the railways themselves. They could then maintain their present tariff, which was to the advantage of everybody. It was desirable to encourage feeder-services, and for that reason he agreed with Sir Henry Fowler that it would be undesirable to limit the axle-load to the extent referred to in the Paper, because they should be operated with the most efficient machines obtainable. He thought, however, that it would be found necessary to license them, in order to protect sound undertakings from irresponsible competition. If the railways were not to be given a monopoly, but competition were permitted, it would be necessary to give them freedom to fix their own tariffs; but he would draw attention to the

fact that they could not increase the tariffs on the low-grade produce, because ex hypothesi under the present tariff structure those tariffs were as high as the traffic would bear, and if they were increased that traffic would stop. The railways, therefore, could not really increase those tariffs except in special circumstances, where conditions had changed since the tariffs were first fixed. In East Africa there were certain export rates which involved carrying the goods at a loss, but which were profitable because of the return import traffic at high rates. Those export rates could not be raised, because if they were the traffic would not pass, but they would be suppressed under a regime of unrestricted competition, because the railway would not accept a loss on the export traffic if it was not going to get the import traffic with which to recoup itself. Where there was competition between different means of transport, the tendency was to cut the rates down in competition to just above the variable cost of working, and that meant that the railways and the motor undertakings would cut right down to the bone, so that both would tend to become commercially impossible. It was therefore very important that the policy to be adopted should be settled as soon as possible, before that mutually destructive action had taken place. A cardinal principle of British transport policy was that each means of transport should pay its way, and that applied not only to private railways but also to Government-owned railways in the Crown Colonies. That was not the case, however, in some countries; many Continental countries, for instance, used their railways deliberately as an instrument of economic policy, not caring whether they made a profit or not. Germany subsidized canals, railways, motor and other transport services, and other countries did the same. In the last resort railways and even road transport would have to be subsidized in England, if it were necessary in the interests of the country, rather than allowed to go out of business. Experience had shown, however, that in some countries the subsidies were already becoming too heavy a burden on the national budget. For example, in Victoria, Australia, the railways were State-owned, the railway revenue was included in the budgetary revenue, and the railway expenditure in the budgetary expenditure. The railway revenue was about 50 per cent. of the budget revenue, and railway expenditure about 50 per cent. of the budget expenditure; while the interest on the railway debt was roughly 50 per cent. of the interest on the total State debt. If the railway position became such that there was no net revenue, it would be necessary to increase the non-railway taxation of the country by about 25 per cent. That was a very significant figure. He had worked out similar figures for other colonies, and for some of the African colonies he had found the interest on the railway debt to be from 8 per cent. to 16 per cent. of the non-railway budget, which demonstrated the liability which might be incurred if the railways were not allowed to earn anything to cover their interest charges. Of course, Government subsidies meant higher general taxation, unless the Author’s suggestion were adopted and a
special tax imposed on motor-transport to make good the railway losses on high-grade traffic. That suggestion sounded very nice so far as Government railways in colonial conditions were concerned, but, if it were applied to a country with private railways, he imagined it would meet with the execration which awaited any proposal to penalize a new means of transport in order to subsidize shareholders in an obsolete industry! Incidentally, he did not think that there was sufficient gratitude in England to the railway shareholders for saving the country from the additional taxation which would be necessary to meet the interest on the railway debt if the railways were State-owned. However, he thought it was safer to regulate road and rail competition by licence, and this was easier under colonial conditions, as the ancillary services, which caused serious difficulties in connection with any such proposal in a developed country, were comparatively small and doubtless easy to control.

Mr. G. V. O. Bulkeley, of Nigeria, thought that it might be taken as axiomatic that the proper development of the Crown Colonies and Protectorates would depend upon the co-ordination of both railway and road transport, and he proposed to consider a few of the financial and administrative difficulties of effecting that co-ordination. In the Crown Colonies and Protectorates (though not in the Dominions, because the problems there were quite different), the railways had been built by the Governments not to earn dividends but to develop the colonies and the indigenous peoples thereof. In those tropical lands construction was expensive, so that the railways were often heavily capitalized per mile in relation to the average earning-power of the native population which they served. The result of that was almost inevitably an annual deficit on the railway, at any rate while the development of the colony was progressing, and that deficit was usually met by the Government out of the general taxation of the country. If, as the colony developed, the whole of the available traffic were handed to the railway, he thought the rates could in time be cut so low that they would be below the rates at which road motors could economically work. That, however, was not what occurred; the African owner-driver cut in more and more with his vehicle. As the Author had pointed out, his low standard of living, hire-purchase of his vehicle, general lack of maintenance, and almost invariable overloading enabled him to compete unfairly with the Government railway. A further point was that the Government railway, in order to serve as many places as possible, was very seldom the shortest route between two main centres, whereas the road short-circuited them; and that also gave a considerable advantage to the African owner-driver. If he was allowed to multiply, there was produced, sooner or later, a horde of vehicles which, competing with the facilities already given by the Government railway, caused an uneconomic glut of transport in various districts. That had already occurred in Nigeria; for instance, there were several hundred road motor-vehicles plying between Ibadan and the
coast, about a hundred miles away. Another factor which helped the owner-driver in those countries was that the centres for marketing produce were not stable, so that as time went on they might migrate to places perhaps 20 or 30 miles from the railway, which again gave the road vehicle a shorter route to the port than the railway could provide. It might be said that it should be quite easy to evolve a co-ordinated system under which the revenue of the railway would be safeguarded and the road given its proper sphere; but in fact the interests of the African tended to prevent that being fully done. It would be appreciated that the cardinal principle of all the Governments of the Crown Colonies and Protectorates was the development of the native himself; and, although the Government owned the railway, they were loth to legislate in a way which would interfere with any legitimate earning-power of the native. Colonial Governments were therefore faced with a difficult problem in dealing with the co-ordination of road motor-vehicles and the Government railway. Recurring railway deficits, however, combined with the prolonged trade depression, had made it necessary for Colonial Governments to act. A sound public opinion was all-important. In Kenya, recently, the Government had been immensely assisted in that respect by the leading Chambers of Commerce in that colony passing resolutions in unmistakable language calling on the Government to regulate motor transport, which was paralleling and short-circuiting the railway – on the ground that the railway was the national transport system, and that anything which tended to reduce its revenue by uneconomic competition might very easily produce the necessity for additional general taxation to meet the deficit. He thought the best method of co-ordinating road and rail transport in a Crown Colony, speaking broadly, would be for the main line of railway to penetrate the colony fully and for the railway to operate road-vehicles with diesel-engines in remote districts, rather than to build branch lines; except where there was mineral traffic which lorries could not handle. The country should then be divided transversely into 30-mile zones, extending a reasonable distance on each side of the railway, and public road vehicles licensed for one zone only, no motor-transport being permitted from one zone to another, either directly or by relay. By means of registration plates of different / colours and some police supervision, leakage could be controlled. Public motor-vehicles would be allowed complete freedom of action in their own zone, transversely and longitudinally. In the coastal zone, road vehicles should be operated under special licences only to perform services which were deemed to be in the public interest, in order to concentrate the export and import traffic on the authorized port and to prevent leakage across the foreshore elsewhere. Colonial Governments, moreover, should not construct any more motor roadways which closely paralleled or short-circuit the direct railway route. He thought a scheme on the lines he had indicated would probably coordinate the services as well as could be expected.
Mr. F. C. Cook thought that the Paper was particularly interesting because the Author had approached from a new angle problems which had beset many European countries, and which at present were of vital concern to England. The picture which the Author drew of the native owner-driver, with no overhead charges, the roadside his garage and the bus his home, working long hours for a bare living and uncontrolled by such factors as depreciation and renewal, was somewhat akin to the position which arose in this country immediately after the war, when ex-Service men, whose gratuity was sufficient to buy a second-hand lorry in some stage of decrepitude, endeavoured, pluckily enough, to earn a living for themselves, with results in many cases disastrous to already-established forms of transport and indeed to transport as a whole. Those who were concerned with road administration must find it difficult to credit the very low costs of which the Author gave illustrations. £3,000 to £5,000 per mile for narrow-gauge railways and £1,000 per mile for macadamized and tarred roads were figures which, presumably, could apply only where ample local material was available and where labour was almost as easy to obtain as it was for the building of the Pyramids. There was one calculation which the Author made, however, which he did not quite understand. The Author put the extra cost of macadamizing a gravel road at £850 a mile, and gave the annual charges as £51. On the basis of interest at 4 per cent., he therefore appeared to have assumed a life of something over 30 years for the road, which was surely very much in excess of its probable life, no matter what the traffic might be. In one way the conditions discussed by the Author differed very much from those with which European countries had to deal, as in all the countries referred to the railways had preceded the roads, whereas in countries of earlier civilization roads had formed the accepted means of transport centuries before the railways came into existence; but, in either case, there was evidently the same complaint of the detrimental effect of road competition upon the railway. As had already been mentioned by General Mance, it would seem that in new countries there should be no difficulty in so controlling road and railway development as to preclude uneconomic competition. It was thoroughly undesirable that such a position should be allowed to arise as that which existed in Tanganyika, where road charges were so excessive that the effect of railway competition was to reduce them by no less than one-third, namely, from 2s. to 1s. 4d. per ton-mile. The Author pointed out that in many tropical countries primitive pathways were all that was required for the convenience of the population, and that roads were unnecessary except for the purposes of motor transport. Even under such conditions as those it seemed that roads must have some value to the community, and that that factor would assume greater proportions as industrial and social development proceeded. If that were admitted, then it would be unreasonable to burden motor traffic with the whole cost of road construction, unless indeed the road were to be preserved.
solely for the use of mechanically-propelled vehicles. He agreed with the Author that it was in accordance with sound economic principles, and indeed in the interest of the road itself, from the point of view of upkeep, that commercial transport using the road should be capable of earning interest on capital expenditure, providing for depreciation, and paying adequate wages to the personnel engaged. He agreed also that regulations might be necessary for governing axle-loads, charges, and in some cases freights, and for ensuring that road vehicles paid such share of the cost of upkeep of the roads as might properly be apportioned to them. The difficulty of assessing the last-named factor was well known in England, and those who had to deal with the problem in new countries, where there was no need to make allowance for what the Salter Conference denominated ‘the legacy of the past,’ were very fortunate. Mention of rates led him to suggest that the railway method of charging what the traffic would bear had resulted inevitably in discrimination which might operate unfairly in favour of some particular article, and had led directly to the competition from road haulage which the railway companies had found reason to deplore. It was noteworthy, for instance, that in the case of Uganda in 1932 only 2 per cent. of the tonnage of goods was carried at the three top rates, whereas only a few years previously those three classes contributed the large percentage of 25 per cent. of the total revenue. The differentiation in railway rates to which the Author alluded must inevitably encourage competition by road, especially for the transport of the higher-rated goods, and competition once established tended to spread. He was inclined to agree with the Author that the nearer the approach to a uniform rate for all kinds of traffic, the more readily would the railways secure the traffic. In that connection it must be remembered that the new countries with which the Paper was concerned were particularly dependent on the export of commodities brought to the coast often after long haulage, which in the case of Kenya was upwards of 300 miles. The Author implied that the particulars he gave were applicable only to the territories specifically mentioned in the Paper. To many members, however, the main interest of the Paper must lie in their application to the conditions in England and similar countries. A most interesting report, to which General Mance had already referred, had recently been published by the International Chamber of Commerce.* The Report, in its conclusions, considered that the function of the State was not to maintain the status quo or to favour one means of transport at the expense of another, but to create the requisite conditions for securing the maximum efficiency of all means of transport, and to further their evolution in the interests of the general welfare of the community and of technical progress. Those aims could be attained only by

* ‘Introductory Report submitted by the Committee of Independent Experts on Road and Rail Transport to the International Chamber of Commerce.’ International Chamber of Commerce, Paris; Brochure No. 85; October, 1933.
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a series of measures, the nature and scope of which would be influenced by the conditions existing in the particular country. It followed, he thought, that the maximum efficiency of one means of transport or another was not likely to be achieved without the stimulus afforded by competition, and competition could not be effectively secured if all reasonably available means of transport were in one ownership. In new countries, or in any country where both roads and railways were property developed by the State, it might be that good administration, strengthened by the force of public opinion, would meet the requisite needs, but otherwise there was no alternative to the regulation of both systems in such a manner as to ensure that neither was favoured by unfair advantages nor, on the other hand, hampered by undue restrictions. He would put forward the following considerations. The greatest hindrance in the development of an efficient system of transport lay in the suggestion, expressed or implied, that the interests of the railway and the road were mutually antagonistic. Except in those cases where produce could be railed over a long uninterrupted mileage from the fields to the port, railways must be fed by an adequate road system, and neglect of that principle had probably led to the construction of many miles of railway which could not be economically justified. Roads had the advantage of being capable of gradual improvement to meet the needs of the traffic to be served, provided that point / was borne in mind in the initial lay-out, alignment and grading, and development of the road system beyond its use as a feeder to the railway was closely related to the growth of private-car traffic. In new countries rail and road transport should be wholly complementary, although as social development increased they might tend in certain respects to become distinct; each service must be judged on its merits, and one could not be placed in a subordinate position to the other. It was therefore essential that, in new countries in particular, road and rail development should be so controlled that they proceeded with due regard to the needs for which each was best adapted.

Mr. E. L. Leeming remarked that the Author had covered his subject in a comprehensive manner, and he found it rather difficult to deduce conclusions on transport problems. He thought that there was a good case for constructing earth roads as service roads alongside railways, which were often the best routes for them to take, and he did not see the reason for the Author’s suggestion that there should be a limit on the type of vehicle using those roads; that limit would be set very largely by the type of road itself, particularly in the case of earth roads. There was a strong argument for reducing the joint costs of roads and railways by the common use of gradients, routes, bridges, viaducts, drainage and other facilities, which were advantageous to both kinds of traffic. All costly bridges, whether railway or road, should be designed to accommodate both types of traffic. For example, had the Forth Bridge been designed for road-traffic as well as rail it would have been of immense advantage to the adjacent districts. Another
example was the Britannia Bridge over the Menai Straits; even now he thought that bridge could be made to carry road-traffic on the top flange. Further, he thought that road-traffic could pass over some of the existing railway-bridges intermittently or at week-ends, and the railway companies could recover a good deal of revenue from road traffic to offset their expenditure on those bridges. It would seem that railways should lead to centres of development and industrial areas, and that perhaps greater ramifications in the way of branch-line connections should be made to improve the utility of the railways. Questions of cost often appeared to be considered too narrowly. Interest charges at the moment were low, and there was a strong argument for constructing further railways and roads by capital expenditure. Motor-car transport, in spite of heavy taxation, was in keen competition with the railways for passenger-traffic. Electric railway passenger-services were of more value when they passed through the centre of towns either on the surface, where practicable, or just beneath the surface, as in New York. Adjustment of railway-rates where road-competition over short distances existed was only similar to the policy adopted by the Post Office, which subsidized postage to the colonies or over long distances, and certainly did not carry letters at an economic rate from Land's End to John O'Groats. Where tramways existed in towns, rail-truck haulage at night-time could be instituted with advantage. One serious disadvantage of rail-traffic as compared with road-traffic was the heavy weight of rolling-stock. The Author said that road-transport charges did not cover the cost of road-upkeep; personally, he thought that depended on the particular taxation in the country concerned. At the present time in England road transport was subsidizing in many ways various State services. The Paper appeared to suggest that national planning should be carried out, that road and rail should be dealt with jointly under one control and as one interest of the type of the London Passenger Transport Board. He felt that it was on those lines that the best and most economical results would be obtained from road and rail development in the colonies.

The Author.

The Author, in reply, said that Sir Henry Fowler had referred to the question of feeders to railways and to the road vehicle which his Committee had produced. All colonial railways needed lateral feeders, and he did not think that in the future any one was likely to suggest that a branch railway should be built where it was possible to provide the necessary traffic facilities by means of road transport. Sir Henry had asked whether the costs of rail transport quoted in the Paper were operating figures only, or whether they included the overhead charges for interest, depreciation and so on. The year 1932, for which the figures were given, was an exceedingly bad year for colonial railways from the point of view of revenue. In the Federated Malay States in 1932 the railways earned less than half of what they earned in 1930, and the working results of 1932 were not a measure
of the ability of the colonial railways to earn sufficient to cover all their overhead charges; but average receipts of 2d. per ton-mile on the Nigerian Railway, 1.54d. on the Kenya & Uganda Railway, and 2.5d. on the Tanganyika Railway would have been sufficient to yield a net revenue which would have covered all interest and sinking-fund charges on those railways. The Author agreed that freedom should be given to 30-cwt. lorries to operate on colonial roads, but he believed that there were a number of lorries with a carrying capacity of 30 cwt. whose axle-load did not exceed 2 tons. Colonial bridges had been designed in recent years for two standards, namely, heavy and light. The heavy standard was suitable for axle-loads up to 8 tons and the light standard for axle-loads up to 4 tons.

Sir John Thornycroft had referred to the fact that road-haulage costs in South Africa were about 4d. per ton-mile, which was appreciably less than the figure given in the Paper. He believed, however, that in South Africa very heavy lorries were employed, also that trailers were used to a large extent, and therefore the loads could be increased and the cost per mile reduced. On the South African Railways rail costs averaged less than 1d. per ton-mile, so that the ratio of road costs to rail costs was 4 to 1, or even, larger than the ratio adopted in the Paper.

General Mance had said that the present rate-structure was inevitable and advantageous with a monopoly, but impossible without a monopoly, and that, if the present rate-structure for colonial services was to be maintained, it was necessary to create a monopoly and thus maintain their present tariff. He pointed out that colonial railways could not increase their tariffs since, presumably, they were as high as the traffic would bear. The Author thought that was undoubtedly so at the present time but, if the prices of tropical commodities were to increase appreciably within the next few years, there would be a possibility of increasing rates. It was, in fact, a question whether railway rates should not be on a sliding scale, varying with the price of the commodity. In that way profits could be made and set aside in years of prosperity to cover losses during periods of trade depression. The export rates were those which presented the greatest difficulty, because in tropical countries the wealth of the country was due chiefly to agricultural products which had to be carried at low rates if they were to reach world markets. It was only the wealth arising from the marketing of those tropical products that could pay for the imported goods which, being of greater value, enabled road transport to operate successfully.

Mr. Bulkeley’s suggestion of zoning road traffic was very interesting, and should provide a solution for some of the disadvantages arising from unrestricted competition, as it would prevent road traffic competing over the long distances for which rail transport was the more suitable.

Mr. Cook had referred to the statement that in Tanganyika road haulage charges had dropped from 2s. to 1s. 4d. per ton-mile where there was railway...
competition. He thought it should be made clear that the charge of 2s. per ton-mile was made in remote districts where traffic was very light.

It had been suggested by Mr. Leeming that costly bridges should be designed to accommodate both rail and road traffic. That was often done in the colonies, and the recently-completed Benue bridge across the river Niger was an example of a bridge constructed to carry both rail and road traffic.

[...]

Mr. H. C. M. Austen, of the Mauritius Railway, remarked that the Midland and North lines of that railway, completed in 1864, had been constructed to the English standard gauge, with chairs. Mauritius being a small island, and already provided with very good military roads (made of the excellent basalt stone abounding in island) to link up the various fortified posts round the coast, as well as sea transport, it was doubtful whether a railway, and certainly a standard-gauge railway, was ever required. The development of the Colony would, however, have been retarded if none had been built. The railway, when once constructed, did give very great impetus to the island’s sugar production. The output in 1865 was about 120,000 tons, and that in 1933 was 262,000 tons. In 1914, the output was slightly larger than that figure, and it was certain that no system of mechanical transport, other than the railway – obviously not the old mule- or ox-cart system that existed in 1860 – could then have transported so large a tonnage. The very important factors of weather and time had also to be considered. Sugar would not keep in the moist upland climate of Mauritius, where a great many of the factories were, and, as the crop was cut between August and December, the sugar had to be carried promptly to Port Louis for storage and, moreover, carried in such a way as to keep in good condition en route. It was generally conceded that the railway was essential for the sugar industry in Mauritius. Unfortunately, there were a number of factories which seemed unmindful of the original impetus given by the railway to the industry, and preferred to send their sugar by road rather than pay the very slightly higher rates demanded by the railway, thereby depriving the railway of about 18 per cent. of the total tonnage available for transport. The sugar rates and general goods rates on the Mauritius Railways averaged 3¼d. and 2d. per ton-mile respectively. Those rates could not be considered exorbitant, but the railway had to carry on a perpetual competition (which, in itself, was not an evil) with road-transport / companies, though those companies had apparently considerable difficulty in making both ends meet without dipping into their depreciation funds to pay dividends, or, alternatively, raising fresh capital when their old plant was worn out and new plant became a necessity. Heavy gradients affected the cost both of road-and rail-transport; the railway, on its Midland line, over a length of 16 miles, had long gradients of 1 in 26 to negotiate, the peak being 1,800 feet above sea-level at Curepipe, about equidistant from the terminal points 36 miles apart, i.e. Port
Louis, Mahebourg and Souillac. The North line and the other branch lines were reasonably level, and he considered that under present tax and import-duty conditions it would only be economically sound to carry goods by road within a distance of about 10 miles from Port Louis. On the other hand, the revenue derived from motor-spirit and lubricating-oil importations was large, so that all the indications pointed to the need for a unified central control which should hold the balance equitably between the various systems of transport, old and new, that the Colony possessed.

Passenger traffic receipts had fallen from Rs.1,500,000 in 1927/8 to Rs.420,000 in 1932/3, owing to the rapid development of buses and cars. The number of bus journeys made in 1928 was 61,000 carrying 850,000 passengers, as against 186,000 bus journeys in 1933 carrying 3,000,000 passengers; the buses used in Mauritius were of the ‘light’ type. The Mauritius Railway did not expect to recover all its former passenger traffic, but had cut down and speeded up its train service and reduced its fares in such a way that it had definitely and, he thought, permanently recovered sufficient passenger traffic to yield a revenue in 1934 of about Rs.500,000. Further, a revision of rates and a door-to-door rail-and-road service, the road work being effected by contract, had produced a marked improvement of revenue from general goods traffic, which should be maintained. Railway costs had, at the same time, been thoroughly overhauled. In spite of heavily increased expenditure due to gratuities and pensions, as the result of drastic reductions in personnel, the total expenditure had fallen from Rs.3,230,000 in 1927/8 to about Rs.1,700,000 in 1933/4. Replacements of rolling stock by items of more modern design were gradually being made, and a fixed sum annually would in future be set aside for the renewal of railway wasting assets. He considered that there was no reason why the railway should not continue to function to the economic advantage of the Colony, working side by side with the roadways, provided that the transport situation generally was firmly controlled by an impartial authority, with due regard to the present and future needs of the Colony and a sound technical judgment on all mechanical systems / of transport and their developments, always bearing in mind the commercial and financial issues involved in relation to the local problems which such developments might be designed to assist. Views on traffic control similar to those expressed by the Author were embodied 2 years ago in Mauritius under the Transport Control Board Ordinance, but the issue of regulations putting into effect certain of the powers so conferred has been delayed by other matters.

Mr. H. D. BINDLEY remarked that during the last 10 years the following railway extensions had been constructed in the Sudan:

- Haiya to Kassala(1923–24) 347 kilometres.
- Kassala to Sennar(1926–29) 455 “
- Khartoum to Gordon’s Tree(1930) 8 “
- Gordon’s Tree to Gebel Aulia(1933) 38 “

848 kilometres or 530 miles (of single track).
The average cost of those lines, including station buildings, quarters for staff, telegraphs, signalling, bridging, etc., was approximately £E.3,000* per mile. Motor-transport competition with the railways began about 1927 and, at first, was limited almost entirely to the cotton-growing area of the Gezira and to the carriage of passengers in that area, but later it extended to the transport of goods as well. Its development progressed rapidly until retarded by the economic depression, but there were indications of its revival. Some years ago the railways introduced motor-transport services of their own in order to obtain first-hand experience of that form of transport as feeder-services. The urgent necessity for retrenchment resulted in the abandonment of the schemes, and unfortunately the comparative results of the working of a motor-transport scheme on a sound basis as against the native-operated schemes were lost. The Author’s comparisons of the Government-owned motor-service and the native bus-service was as applicable to the Sudan as to the colonies about which he wrote. The Sudan Railways charges varied from less than 1 millième (¼d.) to nearly 21 millièmes (5d.) per ton-kilometre. The average full working costs amounted to about 2-2 millièmes and average rates to 3-6 millièmes per ton-kilometre. Privately-owned motor-transport operating in the Sudan had as yet little or no public responsibility and was practically free from control. Its method of assessment of charges was therefore bound by no prescribed principle. It would probably not be far wrong to take an average figure of 11 millièmes per ton-kilometre as the present minimum working cost of motor-transport in the Sudan. That figure was no less than five times as high as average railway working cost, but even so was far below the upper range of railway charges, wherein lay the ability of motor-transport to attract traffic from the railway. Motor-transport had not found conditions of operating in the Sudan as favourable as in many other countries. Distances were great, and proper roads practically non-existent. Also, except possibly in the Gezira, there were no areas having an appreciable density of local traffic. Throughout the greater part of the year, nevertheless, the conditions offered considerable opportunities for the resourceful private motor-transport owner to ply alongside the railway, offering to carry passengers at lower fares, and goods at rates lower than the higher ranges of railway-rates.

Mr. M. B. BUXTON observed that the development of African Colonies had been for a long time almost impossible owing to the curse of slavery; the natives would not settle down to cultivation and trade when at any moment raiders might appear and carry them off into slavery. Those who at the beginning of last century fought the slave trade recognized that the building of good roads in such countries as the Gold Coast and Nigeria would open up the country to lawful trade and stop much of the slave-raiding, and constantly advocated their con-

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* £E1 equals 1,000 milliemes equals £1 0s. 6d. sterling.
struction. The subsequent history of Africa had proved the correctness of that
view and shown the utility of roads both in the cause of humanity and colonial
development; he was convinced that in backward countries good roads were of
more value than railways.

[...]

Mr. C. L. Cox, of Nigeria, remarked that the Paper would be read with very
great interest by colonial officials. It well crystallized the road and rail situation
and gave a mass of pertinent information. The dictum in the last paragraph was,
he suggested, too stringent; and he would prefer to say that colonial prosperity
was dependent on the efficient and co-ordinated development of all transport
services. In Nigeria a considerable volume of traffic was carried by the waterways.
The cost of road-transport, including all charges, might well be less than that of
a section or branch of a railway / running at low capacity or subject to widely
varying seasonal traffic – a traffic that road-transport organizations could, if road
intercommunication were adequate, more easily adjust themselves to meet.

He suggested that roads were in any case essential to the opening-up and settle-
ment of a country, to the intercourse of its peoples and to its administration, and
– if human labour were to be spared – that they must precede the railway which
later they might feed. Moreover, the possibility of improvement, perhaps revo-
lutionary, in the mechanics and economics of self-propelled road vehicles and in
methods of road construction should not be overlooked. Road-transport rates of
less than 3d. per ton-mile had been freely quoted in Nigeria, and – whether those
rates were remunerative or not, and however uneconomic his financial arrange-
ments might appear – there as elsewhere the native owner as owner-driver had
come to stay. The annual maintenance cost of the metalled, gravelled and earth
roads maintained by the Nigerian P.W.D. now averaged £28 per mile, and recent
experimental work, on the lines of the bitumen-surftaced so-called ‘low-cost’ roads
of the United States, indicated that it should be possible, when increasing prosper-
ity warranted it, to provide roads suitable for considerable traffic at a reasonable
cost and without recourse to heavy metalled construction.

It was refreshing to read references to the savings in transport costs that
could be effected by good roads. Those savings did not accrue directly to the
responsible road authorities, and their economic influence was frequently over-
looked or disregarded

Mr. F. D. EVANS observed that a full appreciation of the subject required more
information than was given in the Paper, or was indeed available, that the relative
costs and comparisons of road – and rail – transport would be found to differ
widely in different countries, and that the relative deductions and conclusions
would differ, in principle or application, from those presented by the Author.

To the considerations (a), (b), and (c) on p. 546 he would add ‘(d) the ultimate
cost and other factors concerning transport of traffic from origin to destination.’
It seemed inappropriate to him to consider only the cost of constructing railway extensions, as on p. 584 – from £3,200 to £7,000 per mile – since those figures did not include the cost of rolling-stock and expensive facilities necessary for operation; the inclusive cost per mile of a system should be considered (for example, in Nigeria it was £11,600 at the close of the financial year 1932/33); in particular circumstances it might be reasonable to consider some lower figure than the inclusive cost per mile. / 

The average cost of rail-transport per ton-mile, to which reference was made on p. 555, might be misleading in regard to certain aspects of the subject of the Paper; the low costs per ton-mile on a heavily-trafficked section of a railway might obscure the high costs on other sections; in that connection the appropriate cost per mile of extensions might be important.

The cost of constructing and maintaining roads varied greatly with the nature of country and soil passed through, the climate, the class and weight of traffic to be carried, and the standard of construction and maintenance. The weights and types of vehicles were of importance, as well as their numbers. He believed that the American figures quoted on p. 550 related mainly to cars. In Nigeria, most motor traffic included 70 per cent. or more of lorries and buses.

The high maintenance-charge noted for Malaya was due to the high standard of maintenance, the climate, and the sub-grade difficulties, and not to traffic density on country roads. Some gravel roads in south-west Nigeria, totalling 79 miles in length and in fair to good order, carried average traffics varying from 150 to 230 vehicles per day (say 600 to 1,000 tons gross) at an average annual maintenance cost of £57 per mile in 1932/33. The carriageways only cost £35, and improvements – mainly widening – £3 10s. Those were the most heavily-trafficked gravel roads in the country.* The maintenance cost of bituminous surfacing averaged £42 per mile for carriageway only. Those costs were exclusive of engineering and establishment charges, which added approximately 25 per cent. Expenditure on other roads varied from say £5 per mile per annum upwards. While it was true that tractive resistance was less on smooth and costly pavements than on earth or gravel surfaces, he thought that much of the published work on the subject had preceded the recent advances in road maintenance. Earth and gravel roads were not necessarily bad from the point of view of driving comfort or vehicle-maintenance. In any case it was generally true that the cost of roads, when dictated by traffic considerations, was a small proportion only of ton-mile costs, which decreased with increasing traffic. Political considerations in the colonies usually prevented the allocation of funds for roads in excess of the essential minimum.

* The traffic counts were made in 12 hours’ daylight on successive days of record periods. The night traffic was not known, but had been found on some roads to be from 25 to 30 per cent, of daylight traffic during the busy season of produce movement.
Small independent transport enterprises were of the greatest value: 25 years ago, when in Malaya, he had been of the opinion that native motor-transport practice was unsound, but experience had demonstrated the contrary. The hire-purchase system, in Nigeria, required cash payment of half the cost of the vehicle, and insurance until the vehicle was paid for. Large motor-transport organizations had no particular public advantage and many disadvantages; European overhead expenses were heavy, and not ultimately necessary in the tropical colonies.

Whatever the form of ownership and organization, transport owners would charge the maximum they could recover – in other words ‘what the traffic will bear’ – which made it difficult to ascertain costs. Evidence, given to a Nigeria Committee on road and railway competition (of which Mr. Evans was a member), showed that, directly parallel to the railway, road charges per ton-mile varied from less than 2d. upwards, the variation being governed by the railway rates. Road charges in the same area, not directly competing with the railway, were less than 3d. per ton-mile. Petrol cost approximately 2. 2d. per gallon. In the case of road-transport, between Lagos and Ibadan (112 miles by road, 120 miles by rail) the charges per ton-mile then varied from 1.9d. to 2.7 d. according to season (at the time of writing they were 1.6d.). The average capacity of vehicles was less than 2 tons; all had pneumatic tires. The Committee concluded that even a modern economical (petrol) vehicle would operate at a loss at the lower rates per ton-mile, but that profit was made by charges on casual passengers and loads; that vehicles were reasonably well maintained and operated; and that overloading and overspeeding did not generally occur to a dangerous extent.

An important factor was the ability to obtain full loads on all journeys. Recently, moving some 1,500 tons of ground nuts over a distance of 15 miles in Northern Nigeria, 800 tons were transported by camels at 3.6d. per ton-mile and 700 tons by motor-lorry at 6.8d. per ton-mile. Pack animals were not available to carry the 700 tons moved by motor-lorry; little return traffic was available, and petrol cost approximately 3s. per gallon. An assessment of the average cost of motor transport, without regard to the circumstances of particular cases, was as misleading as the similar assessment of the cost of railway transport.

He suggested that the ‘common carrier’ obligation of railways to accept and provide facilities for all kinds of traffic was not material to the point at issue; in so far as railways did so it was by virtue of legal compulsion on account of their monopoly; any other carriers would quote rates for anything within their capacities, and railways did no more. Any carrier would charge ‘what the traffic will bear’ unless prevented from doing so, and he thought that complicated railway rate-structures, built up under conditions which no longer obtained, were not necessarily sound. They could only be maintained by a monopoly. The system might lead to good or evil, but in the colonies he thought the latter was likely; it would seem preferable to endeavour to establish, and charge in relation to,
the real costs, and to subsidize or penalize industries and development by direct allocation to the railway or by import and export duties. When a community exported low-rated produce and imported high-rated produce in reasonable ratio there might be no disadvantage, but when one area exporting low-rated produce on a long haul was given preference against another area exporting on a short haul, the results might be the reverse of those aimed at or desirable. It was pertinent to ask who should bear the loss on transporting nearly 200,000 tons of ground nuts from Northern Nigeria, referred to on p. 564 Traffic that would bear high rates was not everywhere a marked feature of colonial import business; it became less during periods of depression.

When comparing rail- and road-transport he would add that colonial roads and railways had been and would be built not merely for traffic purposes but with a view to easier pacification and administration, also that the need for talking into account funds invested in railways and road-transport might make the problem of existing or potential competition different from that relating to transport in new areas. While the capacity of railways to transport traffic cheaply when concentrated was often a decisive factor, it did not follow that that would be the case when concentration was wasteful or when the railway route was longer than alternative routes. The use of fuels other than petrol might lessen the cost of road-transport. Minimum road-transport costs, based on full loads on all journeys, were possible only when alternative transport was available to deal with one-way loads.

He would suggest that roads should run parallel to railways, and that they would do so when traffic was developed by roads in advance of successive railheads, for the reasons given by the Author. Mr. Evans agreed that road-transport should not be privileged; studies in Nigeria had shown that petrol duty at 8d. per gallon, licence fees, etc., were more than enough to cover inclusive road costs where traffic was moderate, but the greater mileage and expenditure was in respect of roads carrying only a few vehicles each day. He nevertheless thought that road-transport should bear their whole cost.

He suggested that so far as the reasonable operation of colonial railways had been seriously threatened by road-transport, prevention and remedy were largely matters for railway administrations; it was evident that the efforts now being made by railways in all countries to provide better service were the direct outcome of road-competition. A rate-structure based, on costs of service would solve many of the difficulties of road and rail competition in the colonies. The Government of Nigeria, with the advice of the Railway Administration, had recently introduced a flat rate of 2d. per ton-mile for all traffic in the competition zone, with a few minor exceptions. At the same time increased licence fees, and better traffic inspection and control, had been imposed on road vehicles competing with the railway. He thought that regulation should be on behalf of
each colony or suitable group as a whole, and should in no case be decided by limited vested interests, however large they might be. He had to confess to prejudice against all large corporations of a monopolistic character. Motor transport was essential to countries generally, as well as to the profitable operation of colonial railways, and its further development was of the utmost importance. The industry was largely native-owned, and was being developed by native capital and ingenuity; it had naturally developed most where traffic was greatest, and where facilities were greatest for the purchase and maintenance of motor-vehicles. Unregulated motor-transport could become its own enemy, and regulation might be imperative in its own interest. While agreeing with the Author that railways were as essential to-day as ever, he did not agree that they still remained the most effective means of extending the path of civilization however necessary they might be for consolidating such extensions.

[...]

Mr. C. T. Gardner remarked that the Author proposed to lower the railway charges on high-classification goods and to recoup the Joss of revenue by raising the rates on low-classification goods. He thought, on the contrary, that if the rates on the low-classification goods were raised the distance over which motor competition would be felt would be increased, and that some of the low-rated goods which previously passed by rail would consequently be lost by the railways to motor-transport.

He felt that the Author had failed to arrive at any very definite conclusions, and he would like to try to extend the Paper, and to wring more out of the very useful data given.

Often it was impossible to say definitely how or why a road was developed. It might start with a bush path, which gradually became wider; some road metal might be put down; the road might then be extended out to a suburb, then macadamized, and a bitumen coat might be applied: in a short time the continuous clamour for good roads would have been yielded to, and a fine metalled road paralleling the railway would have been made. Further, roads were necessary for military purposes and the progress of civilization, and were of a value which could not be expressed in terms of pence per ton-mile. / Mr. Gardner.

The following sentence in the Paper was of outstanding importance: ‘If railways are to continue to carry export traffic at uneconomic rates while higher-rated traffic uses the road, it is doubtful whether they will earn sufficient net revenue to maintain their efficiency’. That was the key-note of the situation, and the indicator of future action.

The Paper showed clearly that the diminution in the railway revenue, setting aside the loss of traffic due to the economic depression, was due to loss of passenger-traffic and of the higher-rated goods traffic owing to motor competition. It was certainly hurtful to any country that that skimming of the ‘cream’
by road-transport should either have the effect of raising rates on bulk traffic, or imperil the economic stability of the railways. It was imperative that the consequent problem should be solved without delay, so as to avoid the hostility and greater difficulties which would arise if various interests became established, which might at a later date, when being brought under inevitable control, feel that they were badly used.

It would appear that more co-operation between the Government departments concerned was desirable. It had been thought that conflicting claims between overlapping departments, such as the railways and the public works, and possibly, in some colonies, the marine and harbour authorities, might be avoided if an engineer skilled in economics occupied a permanent place in the administration; but he did not feel that that solution would be effective, nor did he think that the Author’s proposals were sufficiently precise and definite.

Mr. Gardner would agree to restriction, but he thought it must be constructive restriction, and therefore he would propose the acquisition, of all major motor transport by a transport board. That board would permit only light vehicles to run on the roads, or heavier vehicles under special licence: producers would be permitted to own their own transport under licence, but any transport companies would be taken over at a valuation by the board: the economic structures of the roads department and of the railways should be absorbed into the economic structure of the transport board.

He did not think the railways had yet explored every avenue of recovering or retaining passenger-traffic; the possibility of the high-speed motor-coach operating at frequent intervals on railway-lines, which under present conditions were not at all crowded, had not been adequately investigated. Such vehicles should be designed on the lines of the motor-car, should afford the same standard of comfort, must essentially run at regular and reasonably close intervals so that the passenger should not be bothered with time-tables, and should stop on demand anywhere. They could run at the same cost per mile as road vehicles, carry a larger number of passengers, and offer greater comfort and greater speed. They were being developed on the Continent and in America, but in the colonies they had been put to little, and rather ineffective, use.

Colonel G A. P. Maxwell, of the Tanganyika Railway, remarked that on pp. 547 and 548, new railway construction and its cost in various Colonies, Protectorates and Mandated Territories was dealt with. The following Table* gave particulars of railway construction carried out in Tanganyika in the last 10 years, and some notes on the cost thereof.

* Compiled by Mr. C. Gillman, Chief Engineer, Tanganyika Railway.
Spiller, ‘The Respective Merits of Roads and Railways for Colonial Development’ 395

<table>
<thead>
<tr>
<th>Line (metre-gauge)</th>
<th>Rail weight: lbs. per yard</th>
<th>Percentage ballast</th>
<th>Miles</th>
<th>Correct relative cost, to nearest £1,000</th>
<th>Cost: £ per mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tabora – Mwanza.</td>
<td>45</td>
<td>20</td>
<td>25 per cent. flat bush-covered; 75 per cent. open sheet-flood country.</td>
<td>235.5</td>
<td>£1,054,000</td>
</tr>
<tr>
<td>Moshi – Arusha.</td>
<td>45</td>
<td>70</td>
<td>Hilly with heavy bridging.</td>
<td>44.5</td>
<td>£322,000</td>
</tr>
<tr>
<td>Manyoni – Kinyangiri.</td>
<td>45</td>
<td>Nil</td>
<td>35 per cent. flat bush-covered; 50 per cent. open sheet-flood; 15 per cent. heavy formation.</td>
<td>94</td>
<td>£545,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>374</strong></td>
<td><strong>£1,921,000</strong></td>
</tr>
</tbody>
</table>

**Note.** – Parts of the lines tabulated above utilized second-hand permanent-way material, or included short sections of existing track. The figures of coat have therefore been corrected as for construction with new material throughout.

Regarding the cost of road construction, his impression was that in Tanganyika road-making was rather more expensive than any figure mentioned in the Paper, owing to the almost complete lack of suitable road-making material. For the construction of metalled roads he had found it necessary to allow approximately £2,000 per mile. / 

A great deal of the competition arising in Tanganyika between road and rail was due to privately-owned vehicles being run on uneconomic lines without regard to interest on capital, depreciation, etc. A. vehicle obtained on the hire-purchase system was often run to death before it was paid for, and final payment might never be made. In the course of dealing with many problems of marketing native produce, he had gone most carefully into the figures of the cost of road transport, and he was convinced that even near the coast the actual operating expenditure of motor transport, allowing for all charges, was in the neighbourhood of 5-4d. per ton-mile, and that up-country on rather poorer roads it increased to between 6-5d. and 7d. per ton-mile. Those figures took no account of direct payment towards the upkeep of roads. At the present time, owing to the fact that lorries were actually in existence and their owners trying to make a living by keeping them going, rates as low as 6d. per ton-mile were being quoted in the interior of the Territory, but he was quite convinced that those rates could not be maintained for any lengthy period if capital cost and depreciation were taken into account.

The cost of rail transport was of major importance. Tanganyika Territory was rather over 365,000 square miles in area, and had a population of about 4½ millions. The railway was about 1,458 miles in length, and the main line from
Dar-es-Salaam to Kigoma, which might be said to have followed the engineering line of least resistance, was 772 miles in length. The population was centred in well-defined parts of the Territory, and many of the centres were some distance from rail. Also, about five-eighths of the total area of the territory was infested with tsetse fly and was practically uninhabited. The present annual tonnage on the railway was about 220,000 tons, and the receipts 1.75d per ton-mile, which did not cover the total expenses of the railway, so that it was actually run at a loss. He calculated that 2.5d per ton-mile on the present very small tonnage would cover all expenses, and that if the tonnage could be worked up to 600,000 tons, an average receipt of 1.5d per ton-mile would cover all expenses.

The rating employed was almost exactly similar to that in force on the Kenya and Uganda Railways. The export rates differed very considerably from those quoted as in force in Nigeria. The main centre of ground-nut production in Tanganyika was 700 miles from the coast, and 35s. per ton was the maximum rate which it was considered that industry could afford, so that the railway was faced with carrying some 10,000 tons of ground-nuts 700 miles for 35s. per ton, the average rate being 0.6d. per ton-mile, which was actually below the cost of working. Obviously no form of road-transport could possibly cope with such bulk traffic at that price, and so in 1931 a Bill was introduced placing a heavy licence fee on road-transport along roads running parallel to the railways. Those licences were not sufficient to stop competition altogether, but did a great deal to return import traffic to the railways, and a Bill was introduced in the Council April, 1934, to prohibit competition by road-transport along roads parallel to the railway. No licence or penalty of any kind was imposed on motor-transport using feeder-roads to the railway.

He had considered very closely the question of abolishing the highest rate on the railways, but he had concluded that revenue would be actually lost by that proceeding, even though some of the traffic which had gone to the road might be recovered, and those final figures had induced the Government to bring in the new Bill. On a long system of rail such as that of Tanganyika, it was almost impossible to retain the short-distance passenger for the railway, as the service could not be made sufficiently frequent and sufficiently fast to attract him from the road. He considered it equally certain that to raise the low-class rates would only result in stifling the development of the country, so that, as long as the tonnage remained small, the country must face a deficit on its railways.

The following was an extract from a report he had written some little time ago:

‘Taking past history, it may be stated generally that all Colonial Government Railways have actually, in the beginning, been run for the benefit of the country, and not with the view of placing them in a sound financial position, although I agree that the degree of soundness varies largely. Practically none of
them, however, have built up a sufficiently large Reserve fund to carry them over any extended period of general depression or over a period of continued failure of the staple crop of the country. I do not say that the object should not be to put Colonial Railways on a sound financial basis, and in periods of reasonable trade activity once the Colony has become properly established, it should be the desire of all concerned to have a sound and separate Railway Budget, but, in the early days of a Colony or in a period of extreme depression, I maintain that the Railway should be used for the general welfare of the Colony for quoting low export rates in order to enable the Colony to establish a favourable balance of trade, out of which a subsidy to the Railway can easily be forthcoming. I also consider that any grants so given should not be repayable until the Railway has been put on a sound financial basis during the boom period following the depression.

‘Looking at Colonial Railways another way, the Railway Budget is ordinarily charged with the whole of the interest on Railway Construction, whereas development benefits the Government by Customs Returns and by general taxation probably far more than it ever benefits the Railway, so that, as long as the Government is satisfied that their Railway is well and economically managed, they should assume that the period of depression is not a permanency and should, during this period of depression, be prepared to shoulder the interest charges on the original capital expended on Railway construction for development purposes. It must be borne in mind that a Government Railway is given no grants of land, or no control over mineral rights in the country over which it is built such as would be demanded by a private Company undertaking railway construction.’

Mr. H. C. Platts remarked that, although conditions in many colonies were similar, it was often difficult in one colony to reap the benefit of experience in another, and the pooling of information carried out by the Author was of great benefit. It seemed a pity that, in spite of the interchangeability of technical personnel between colonies, there was no centralized co-ordination of colonial engineering services, and it was well that The Institution provided a means of exchange of information that was not always readily obtainable through official channels. Could the Author give any figures relating to the ton-mileage cost on railways with a short average haul, such as in Trinidad and Mauritius? Mr. Platts had spent rather more than five years in the East African islands of Zanzibar and Pemba, mostly on the construction of new roads and road-bridges, as after the war a vigorous policy of road construction was pursued as the best means of developing internal communications, and he did not think that a railway was ever seriously considered as an alternative. An economic reason for favouring road rather than railway development in those islands was that the principal product, cloves, was comparatively high-priced in relation to its bulk; also Pemba was topographically unsuited to easy railway construction. The calculable facts of economics were not, however, the only points to be taken into consideration,
because a road system offered social and administrative advantages of a value that it was almost impossible to assess. In a small island like Zanzibar with an average population density of about 200 per square mile, those advantages were so important that a road system was indispensable. A railway could / not be regarded as an alternative, but only as a supplement to be added if potential traffic should justify its construction.

Mr. Platts was subsequently, from 1927 to 1929, responsible for over 600 miles of main roads in the Tanga and Northern Provinces of Tanganyika Territory (Fig. 9). That district was served by a metre-gauge railway running about 220 miles inland to Moshi on the slopes of Mount Kilimanjaro, with an extension, recently constructed, to Arusha, 50 miles west of Moshi. The greater part of the railway existed before the roads, and he had soon come into contact with the road-rail problem, and with ‘parallelism’ in particular. The area served by the railway was developing rapidly during that period, but in 1927 through road communication parallel to the railway was only possible from the port of Tanga to Mkomasi, about 117 miles along the railway. That route was rather hazardous because the Lwengera bridge near Korogwe was very primitive, and liable to submersion during the rains.

During his term of office, a number of war-demolished bridges on the pre-war road connecting Mkomasi and Same were rebuilt, and although technically that road was a railway feeder because it served the side of the South Pare Mountains remote from the railway, the work had the effect also of extending ‘parallelism’ as far as Same. In the area of the Middle and North Pare development had not advanced to the same extent as farther south-east, nor to the same extent as in the European-settled areas of Moshi and Arusha, but it was making progress and motor tracks were opened between Same and Lembeni, ‘parallelism’ being thus extended still farther north.

The nearest centre of any consequence for the North and Middle / Pare area was Moshi, but access by road was at that time blocked by the River Ruvu. It was suggested that the existing railway bridge over the Ruvu near Kahe should be decked to allow the passage of road-traffic, and that a toll-system should be operated by and on behalf of the railway. That suggestion was made, not only with the intention of advancing essential road communication, but because it occurred to him that it would place a strong weapon in the hands of the railway for defeating unfair parallel competition by lorries. Such a precedent of policy required time for consideration, and the proposal was not developed during his period of office. Meanwhile, however, the necessity for some sort of communication by motor with Moshi became urgent, and some of the local planters, with the assistance of the District Officer in charge of the recently established Pare District, constructed a primitive timber bridge over the Ruvu. Approach tracks were cleared, and thus parallel communication, possible for light lorries and private cars, was established

Mr. Platts.
between Tanga and Moshi. Incidentally, the building of that rather shaky structure opened the Tanga, Usambara and Pare areas for road-communication with the main roads leading to Kenya and Uganda in the north, and the Rhodesias and the Union in the south. The bridge was much too frail to withstand heavily laden lorries, but it was inevitable that public opinion would in the future press for and ultimately obtain a superior structure, and the danger of lorry competition with the railway goods traffic would arise. The Lwengera Bridge near Korogwe previously mentioned was an example of that process; it had a similar and equally humble beginning, but in 1929 the money was found by the Government, and a steel girder-bridge clear of flood level was completed in 1930.

Those examples confirmed the opinion expressed by the Author on p. 571, that it was impossible in practice to confine a road-system to feeders radiating from a railway. Not including the 62 miles from Mkomasi to Same along which the bridges were reconstructed by the Government, about 60 miles of parallel track, passable for private cars and light lorries, came into use in a period of less than 2 years without either direct initiative or expenditure on the part of the Government. That could only be the result of the pressure of necessity, and it was certain that the tracks would ultimately acquire the status of recognized roads, and that the Government would find itself compelled in the interests of the community to undertake their maintenance and improvement. That process of development by roads and motors was inevitable if progress was not to be retarded, and if, indirectly, the welfare of the railway itself was not to be prejudiced. Freedom of movement for people was essential for social, administrative and business purposes, and railway passenger services could never be adequate to fulfil the requirements.

Regarding lorry competition in goods-traffic, no reasonable person could disagree that control of some sort was necessary. The difficulty was to decide what form that control should take, and the method must vary with the conditions peculiar to different localities. Restriction of lorry-size and axle-loads might be suitable in some countries, but it might affect adversely the efficiency and economy of feeder-services. Restriction from the use of roads parallel to railways by licensing or other means might also be possible, but difficulties would arise in practice, because most parallel roads were feeder-roads as well. It had to be borne in mind also that the temporary transfer of lorries to other districts, or to the larger centres for repairs, was not unusual, and it would be unreasonable to restrict such movement. He had concluded that a toll-system operated at key points, such as major bridges, had much to commend it. Control would be concentrated at a few points, and the details of administration should thus present no great difficulty. The tariff could be adjusted according to lorry-size and to the nature of the goods transported, so that adequate protection to railway freight-traffic would be afforded. The revenue would provide funds for maintenance and
interest charges, and any surplus might well be applied to stimulating services of which the legitimate road-user stood so much in need. The combined road-rail bridge was no new conception, and if such bridges were built at important river-crossings where railway construction or reconstruction was undertaken, the control of ‘parallelism’ by tolls could be conveniently exercised should it become necessary. There was a natural reluctance on the part of railway-engineers to contemplate such action, which suggested facilitating road-transport, but a concession to the class of road traffic for which the railway could never cater adequately could be the means of affording effective control of traffic that was truly competitive.

Railways had played, and continued to play, a magnificent and indispensable part in colonial development, but it was well to remember that the monopoly which they once enjoyed for all kinds of land-transport no longer existed. The road and the motor-car had provided a new sphere of convenience and utility to mankind for which, under colonial conditions, the railway could offer no adequate substitute. Both roads and railways had their own place, and it was misleading to think of them in the general sense as alternatives. The question of alternatives arose in a different way when a certain stage of development or potential development was reached in any locality; the choice then lay not between roads and railways / in the general sense, but between roads of a higher standard of construction on the one hand, and a railway and roads of relatively low standard on the other.

[...]
Editorial Notes

Opening of the Lagos–Ibadan Railway for Traffic

1. Sir William MacGregor: Sir William MacGregor (1846–1919), Lieutenant-Governor of British New Guinea, Governor of Newfoundland, Governor of Queensland, and Governor of Lagos Colony (1899–1904).

2. Hausa: The Hausa are a Sahelian people chiefly located in Northern Nigeria and southeastern Niger.

3. Egba: The Egba are a subgroup of the Yoruba people who live in Western Nigeria.

4. Lord Ripon: George Frederick Samuel Robinson (1827–1909), Secretary of State for the Colonies (1892–5) and Viceroy of India (1880–4).

5. Sir Gilbert Carter: Sir Gilbert Thomas Carter (1848–1927), an administrative officer in the Royal Navy, Collector of Customs for the Gold Coast (1879–82), Treasurer of the Gold Coast (1879–82) and the Gambia (1882–6), acting and later Administrator of the Gambia (1886–91), and Governor of Lagos Colony (1891–7), the Bahamas, Barbados and Trinidad and Tobago.

6. Carter Bridge: The Carter Bridge was built in 1901 and connected the mainland to Lagos Island. The bridge starts from Iddo and ends in the Idumota area of Lagos Island.

7. pennons: A pennon is a pennant, banner or flag.

8. eclat: a demonstration of admiration and approbation, such as an applause.

Hoy, State Ownership and Operation of Railways


Governor Sir W. MacGregor to Mr. Lyttelton

1. Governor Sir W. MacGregor: Sir William MacGregor (1846–1919), Governor of Lagos Colony from 1899 to 1904. His main achievements were his success in reducing the incidence of malaria and the construction of roads and a railway.

2. Mr. Lyttelton: Alfred Lyttelton (1857–1913), Liberal Unionist MP, and, from 1903 to 1905, Secretary of State for the Colonies.
3. **Ilesha**: The Ijesha are a subgroup of the Yoruba tribe. Their territory is adjoined by the Ekiti on the east, the Igbomina to the north, the Ife to the south, and the Oyo and Ibolo to the west.

4. **demijohns**: A demijohn is a large, narrow-necked bottle made of glass or earthenware and usually encased in wickerwork.

5. **Oyo**: The oyo belong to the Yoruba ethnic group.

**Railway Retrenchment Committee Report and Recommendations**

1. **cacao harvest**: Cacao is another name for cocoa.


3. **Sinking Fund**: A sinking fund is a fund into which the government annually paid a certain sum, which is then invested in securities. At the end of the loan’s life, the sinking fund is sold and the receipts used to repay the loan.

4. **African Manganese Company**: The African Manganese Company Limited was a subsidiary of Union Carbide Corporation and was established in 1923 to operate the Nsuta manganese mine.

5. **the Gold Coast Chamber of Mines**: The Chamber was established with the goal of advancing and protecting the mining interests of the shareholders of the mining companies that operated in the region. On 6 June 1928, it was incorporated as a private company.

**The Birmingham Chamber of Commerce to Colonial Office**


2. **BIRMINGHAM CHAMBER OF COMMERCE (INCORPORATED)**: The Chamber was established in 1813 to represent the interests of local businesses.


**The Governor of Uganda to the Secretary of State**

1. **Sir Hesketh Bell**: Sir Henry Hesketh Joudou Bell (1864–1952), British colonial administrator and author. Governor of Mauritius from 1916 to 1924.


3. **Kampala-Port Bell Railway**: Kampala–Port Bell Railway was part of the Uganda Railway. It ran for just seven miles (11 km).
4. **H. R. WALLIS**: Henry Richard Wallis was Acting Governor of Nyasaland from 1910 to 1911.

5. **His Excellency Sir Frederick Jackson**: Frederick John Jackson (1859–1929), administrator, explorer and ornithologist. Governor of Uganda from 1911 to 1918.

6. **Thika Branch**: The branch line to Thika was constructed in 1913.

**Gurney, Report of the Road-Rail Transport Committee**

1. **H. L. G. GURNEY**: Sir Henry Lovell Goldsworthy Gurney (1898–1951), Chief Secretary to the Conference of East Africa Governors (1938–44) and Colonial Secretary of the Gold Coast (1944–6). Assassinated by communist insurgents during the Malayan Emergency.

**Mance, Report on the Co-ordination of Transport in Kenya, Uganda and the Tanganyika Territory**

1. **Sir Felix Pole**: Sir Felix John Clewett Pole (1877–1956), General Manager of the Great Western Railway (1921–9) and Executive Chairman of Associated Electrical Industries (1929–45).

2. **primage**: Primage is a tax added to customs duty.

3. **inter se**: between or among themselves.

4. **Dhows**: A dhow is a lateen-rigged sailing vessel, usually with a raised poop, a raked stern and one or two masts.

**Mance, The Railway Systems of West Africa**

1. **Sir Clement Hill**: Sir Clement Lloyd Hill (1845–1913), colonial administrator, MP for Shrewsbury (1906–13).

**Anon., ‘The Railways of Africa’, Railway Gazette, 21 November 1927**

1. **gangers**: A ganger is the foreman of a gang of labourers.

2. **Garratt locomotives**: A Garratt locomotive is articulated in three parts. Its boiler is mounted on the centre frame, and two steam engines are on separate frames, one at each end of the boiler. It was designed by Herbert William Garratt in 1907.

3. **brake vans**: A brake van is the coach or vehicle from which the guard applies the brakes.

4. **bogie**: A bogie is a railway car or locomotive undercarriage having pairs of wheels that swivel so that curves can be negotiated.

5. **buffers**: Buffers are often spring-loaded steel pads attached at both ends of railway vehicles and at the end of a railway track to reduce shock due to contact.

6. **Tyer’s electric key token system**: a form of railway signalling for single line railways. It was first devised by the engineer Edward Tyer after the Thorpe rail accident of 1874. The system used a token, called a tablet, as a physical guarantee to a train crew that their train had exclusive right of way on the single line section. Without this they could not proceed beyond the section signal that protected entry to the single line. With advances in electrical locking of the lever frame within the signal box, the tablet instrument also electrically locked the section signal lever.

8. Strophanthus: Strophanthus is any small tree or shrub of the apocynaceous genus. It has strap-shaped twisted petals and the seeds yield the drug strophanthin.

9. Bantu race: Bantu is a general label for 300–600 ethnic groups in Africa who speak the Bantu languages. They are distributed from Cameroon East across Central Africa and Eastern Africa to Southern Africa.

10. rack locomotives: A rack locomotive is one designed for operation on a rack railway, a line with a toothed rack rail, usually between the running rails.

Anon., ‘The Railways of Africa’, Railway Gazette, 5 December 1927

1. lattice girder: A lattice girder is a girder where the flanges are connected by a lattice web.

2. crib work: Cribwork is a temporary framework that supports a structure.

3. Mallet class: The Mallet Locomotive articulated engine, invented by the Swiss engineer Anatole Mallet (1837–1919). It has two pairs of cylinders, each pair rod-connected to a group of driving wheels.

4. Mikado engines: A Mikado engine, 2–8–2, has a wheel arrangement of two leading wheels on one axle, eight powered and coupled driving wheels on four axles, and two trailing wheels on one axle (usually in a trailing truck).

5. out-turn: the total amount produced during a given period.

6. Churchill Machine Tool Co. Ltd.: founded in 1906 as the manufacturing subsidiary of the machine tool importers Charles Churchill & Company Ltd, established in the early 1900s by the American born Charles Churchill (1837–1916). Initially it adapted tools imported by Charles Churchill & Co Ltd. It then began to produce American tools under licence and finally manufactured equipment of its own design.

7. Kendall & Gent Limited: Kendall & Gent (Manchester) was famous for its plano-mills. In 1917, it became part of Associated British Machine Tool Makers Ltd.


9. Armstrong, Whitworth & Co. Ltd.: Sir W. G. Armstrong Whitworth & Co. Ltd was founded in 1847 by the engineer William George Armstrong (1810–1900). Based in Elswick, Newcastle upon Tyne, it produced armaments, ships, locomotives, automobiles, aircraft and a range of engineering equipment.

10. Dean, Smith & Grace: founded in 1865 by Joseph Dean. Following Dean’s retirement, it traded as Smith & Grace of Thrapston, and, in 1908, became Dean Smith & Grace Ltd. It produced machine tools.

11. Greenwood & Batley: Greenwood & Batley was founded in 1856 by Thomas Greenwood and John Batley. From 1859, the company was based at the Albion Works in Armley Road, Leeds. It manufactured a wide range of goods, including armaments, electrical engineering, and printing and milling machinery.

12. New Alldays & Onions Limited: The Alldays & Onions Pneumatic Engineering Co. of Birmingham was founded in 1889 as a result of the merger of the long established Onions (dating from 1650) and Alldays (dating from 1720) engineering companies. The firm manufactured automobiles.

13. W. & T. Avery Limited: founded in 1730 when James Ford established the business in Digbeth. In 1813, the company was taken over by William and Thomas Avery, who, in 1818, renamed it W. & T. Avery. By 1885, it operated three factories: the Atlas Works in
West Bromwich, the Mill Lane Works in Birmingham and the Moat Lane Works in Digbeth. It became a Public Limited Company in 1891, and, in 1895, it bought the Soho Foundry in Smethwick. From 1897, its steam engine business gradually gave way to the manufacture of weighing machines.

14. bandsaw: A bandsaw uses a blade consisting of a continuous band of metal with teeth along one edge to cut various work pieces.

15. twinscrew: A twin screw steamer is a steam-powered vessel propelled by two screws, one on either side of the keel.

16. a system of banking: A bank engine is a railway locomotive that temporarily assists a train that requires additional power or traction to climb a grade (or bank).

17. treadle lathe: A treadle lathe is a lathe powered by the operator pressing his foot on a treadle.

18. Sir William Arrol & Co. Ltd.: founded by William Arrol (1839–1913) at Dunn Street in Dalmarnock, Glasgow, in 1873. It later expanded to incorporate the Parkhead Crane Works in Nuneaton Street. It was famous for its bridges, which included the Forth Bridge and Tower Bridge, London.


20. Waybilling: A waybill is a document issued by a carrier giving details and instructions relating to the shipment of a consignment of goods.

21. Smith & Coventry Limited: Smith & Coventry Ltd (Salford) produced plain and universal millers, high speed planers and gear-cutting machines. In 1917, it became part of Associated British Machine Tool Makers Ltd.

22. Alley & Maclellan Limited: founded in 1875 and based in Polmadie, Glasgow. It moved from Polmadie Road to the nearby Jessie Street where it continued to trade until the 1950s.

23. Alfred Herbert Limited: founded by Alfred Herbert and William Hubbard in 1888 in Coventry as Herbert & Hubbard, initially making boilers and steam engines. The firm later moved into the manufacture of machine tools, and, in 1890, became Alfred Herbert Ltd.

24. Cincinnati Milling Machine Company: founded in 1889 by Frederick V. Geier and Fred Holz. It was one of the first manufacturers of machine tools.

25. Thwaites & Sons: Thwaites & Sons was founded by Robinson Thwaites (1807–84) in 1848 as Robinson Thwaites & Co., later becoming Thwaites & Carbutt (1862), and Thwaites Brothers (1880).


Anon., ‘Some Typical Modern Locomotives and Rolling Stock for African Railways’

1. *Vulcan Foundry Ltd*: a locomotive builder located at Newton-le-Willows, Lancashire. The firm was originally established in 1832 as Charles Tayleur and Company to produce girders, bridges, switches and crossings and other ironwork for the Liverpool and Manchester Railway. It changed its name to the Vulcan Foundry Company in 1847 and obtained limited liability status in 1864.

2. *tender*: A tender is a railroad carriage attached to the rear of a locomotive that carries fuel and water.


4. *The outside cylinders ... by Walschaerts' motion*: A valve gear invented by Egide Walschaerts in 1844.

5. *These engines ... Newcastle-on-Tyne*: see General Introduction, Volume 1.

6. *The boiler ... smoke-box*: A smoke box is part of a steam locomotive exhaust system. Smoke and hot gases move from the firebox through tubes where they pass heat to the surrounding water in the boiler. The smoke then enters the smoke box and is released to the atmosphere through the chimney.

7. *drawgear*: Draw gear is an apparatus for coupling railway cars.


9. *Two 4-8-0 locomotives ... (Southern Nigeria Line)*: see General Introduction, Volume 1.

10. *A.B.C. couplers*: A.B.C. couplers are a device for automatically coupling railway rolling stock and for transmitting and cushioning the effect of longitudinal stresses generated as a train moves and stops.


13. *Birmingham Railway Carriage & Wagon Company, Ltd.*: The Birmingham Railway Carriage and Wagon Company was a railway locomotive and carriage builder located at Smethwick. It was established in 1854 and its markets included Egypt, India, Iraq, Malaya, Mandate Palestine, South Africa and Nigeria.

14. *Gloucester Railway Carriage & Wagon Company, Ltd.*: a railway rolling stock manufacturer based at Gloucester. It was established in 1860.

15. *Moulmein teak*: teak exported from the Burmese port of Moulmein.

16. *millboard*: Millboard is hard and strong paperboard.

17. *Metropolitan ... Wagon Co., Ltd.*: The Metropolitan Amalgamated Railway Carriage and Wagon Company Ltd was formed in 1863 as the Metropolitan Railway Carriage and Wagon Company Ltd (successors to Messrs Joseph Wright & Sons) of London. In 1845, the carriage works were moved from London to Birmingham, and, in 1902, the company merged with four other carriage and wagon builders to become Metropolitan Amalgamated Railway Carriage and Wagon Company Ltd. By 1926, it had changed its name to Metropolitan Carriage, Wagon & Finance Company Ltd.

18. *Bristol Wagon & Carriage Works, Ltd.*: founded in 1851 as Fowler & Fry by Albert Fry, a member Quaker chocolate manufacturing family, and John Fowler. Fowler left the company in 1855 and was replaced as partner by Albert’s brother Theodore (until 1866). The company, based in Temple Gate and later Lawrence Hill, produced carts, wagons, agricultural machinery and railway locomotives and carriages.

20. **vacuum and hand brakes**: A vacuum brake is a braking system employed on trains introduced in the mid-1860s. Its limitations caused it to be progressively superseded by compressed air systems.

21. **T.R.H. the Duke and Duchess ... to South Africa**: Prince Arthur, Duke of Connaught and Strathearn (1850–1942), seventh child and third son of Queen Victoria, served as the Governor General of Canada. His wife was Princess Louise Margaret of Prussia (1860–1917), a German princess. Princess Patricia of Connaught (1886–1974), a granddaughter of Queen Victoria. She relinquished her title upon her marriage to the commoner Alexander Ramsay.


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**Williams, The Cape to Cairo Railway from the Point of View of African Development**

1. **THE CENTRAL ASIAN SOCIETY**: The Royal Society for Asian Affairs was founded in 1901 to 'promote greater knowledge and understanding of Central Asia and surrounding countries'. Its journal, *Asian Affairs*, was first published in 1914.

2. **LORD CARNOCK**: Arthur Nicolson, first Baron Carnock (1849–1928), a British diplomat and politician. From 1910 to 1916, he was Permanent Under Secretary for Foreign Affairs.

3. **George Grey**: Sir George Grey (1812–98), soldier, explorer and writer. Governor of south Australia, Governor of New Zealand, Governor of Cape Colony (1854–61), and the eleventh Premier of New Zealand.

4. **King Leopold**: Leopold II (1835–1909). Born in Brussels the second (but eldest surviving) son of Leopold I and Louise-Marie of Orléans, he attained the throne on 17 December 1865. He was the founder and sole owner of the Congo Free State from which he extracted a personal fortune initially by the collection of ivory, and, from the 1890s, via the collection of rubber. His harsh regime was directly or indirectly responsible for the death of an estimated six million Africans and the maiming of millions more. For more on the King and the forgotten Congo 'holocaust,' see A. Hochschild, *King Leopold's Ghost: A Story of Greed, Terror, and Heroism in Colonial Africa* (London: Marion Books, 1998).

5. **King Albert**: Albert I (1875–1934), King of the Belgians from 1909 until 1934.

6. **Major Christy**: Major Cuthbert Christy (1863–1932), medical officer, traveller and member of the first Royal Society Africa Sleeping Sickness Commission (1902). Between 1911 and 1914, Christy worked for the Belgian government, investigating sleeping sickness and rubber cultivation in the Congo, and collecting zoological specimens. During 1915–16, he mapped the Nile–Congo boundary for the Sudanese government, and then served in East Africa and Mesopotamia as an army medical officer.


12. Sir Lee Stack: Sir Lee Oliver Fitzmaurice Stack (1868–1924), army officer and Governor-General of the Anglo-Egyptian Sudan. Assassinated while driving through Cairo.


1. JOHN WYATT SPILLER: John Wyatt Spiller was also the author of *The Deflections of Suspension Bridges* (London, 1923).

Spiller, ‘The Respective Merits of Roads and Railways for Colonial Development’


2. The Oversea Mechanical Transport Committee: founded in 1929 to study every aspect of mechanical transport likely to further the economic development of the empire.


4. The Salter Commission: held in 1932 and recommended that UK rail and road should be dealt with on a competitive basis.


7. Brig.-General Sir H. Osborne Mance: Sir Henry Osborne Mance (1875–1966). Served as a subaltern in the Royal Engineers in the Boer War, as Director of Railways, Light Railways and Roads in the 1914–18 War and as a communication expert in the British Delegation to the 1919–20 Peace Conference. His papers are in the National Archive (PRO30).

8. International Chamber of Commerce: founded in 1919 to serve world business by promoting trade and investment, open markets and the free flow of capital. Its international secretariat was established in Paris and its International Court of Arbitration founded in 1923.
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The progress of road construction varied greatly between countries (see Table 1). Early routes included the Stevenson, MacKinnon-Sclater, and a number of Rhodesian roads. The Stevenson roadway ran between Lake Nyassa in Nyasaland and Lake Tanganyika in Central Africa and was constructed in the early 1880s to counter German claims to the hinterland and to extend British commercial and missionary interests, and, in so-doing, to end the slave trade.\(^1\) By the late 1920s, this highway had been joined by three more Nyasaland routes – Chikwawa on the Tchiri River to Blantyre, the country’s commercial centre (25 miles); Blantyre to Zomba (40 miles); and Blantyre to Matope on the Tchiri river (30 miles).\(^2\) The 600-mile MacKinnon-Sclater road, built in the early 1890s, comprised two sections. The Mackinnon route, so-called because it was funded by Sir William Mackinon, the founder of the British East Africa Company, linked Mombassa in Kenya to Kibwezi, and was constructed by the Australian George Wilson to increase trade with Uganda. This road was then extended by Captain B. Sclater of the Royal Engineers to Busia at the Uganda border.\(^3\) Subsequent road construction in Kenya was impressive. From 1902 to 1940, feeder routes were built to link the main agricultural areas with Nairobi, the Uganda Railway and the usable sections of the MacKinnon-Sclater road (much of which fell into disuse after the arrival of the railway), and, by 1947, the country possessed 27,162 km of highway.\(^4\)

Progress in Uganda was less dramatic. By 1932, there were just 1,800 miles of roadway, including the 55-mile Kampala to Toro route.\(^5\) Early Rhodesian roads included Salisbury to Chimoio, Bulawayo–Tati (120 miles), Bulawayo–Charter–Salisbury and the Moodie Trek, running from Fort Victoria Eastward, all of which were built from 1891 to 1895. By 1923, the country possessed over 8,000 miles of highway, though the quality varied considerably (see Cripps, *How Roads were Made in the Native Reserves of Charter District, Mashonaland* (1936) and *Southern Rhodesia. Committee to Enquire into the Costs of Distribution of Imported Goods and Local Products in Southern Rhodesia* (1936), below).\(^6\) As regards South and West Africa, at the end of the First World War, South Africa had 47,000 miles of ‘provincial’ roads and even more miles of ‘farm’ roads (see
Campbell, *Kenya’s Road Policy: Repercussions of South African Practice: Report on a Tour of South African Roads* (1945); Van Reenan, *The Free State Roads* (1914); and *Report of the Commission on Roads* (1921), all below), and, by the early 1920s and late 1920s, Nigeria and the Gold Coast possessed 6,000- and 4,588-mile road systems, respectively (see *Notes on Road Construction* (1933) and *Replies to Questions of the Private Enterprise Committee by the Governor of Sierra Leone* (1923), below).\(^7\)

### Table 1: African Roads, 1935.\(^8\)

<table>
<thead>
<tr>
<th>Colony/country</th>
<th>Kilometre of road per square kilometre of land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basotoland</td>
<td>0.02</td>
</tr>
<tr>
<td>Bechuanaland</td>
<td>0.001</td>
</tr>
<tr>
<td>Gambia</td>
<td>0.004</td>
</tr>
<tr>
<td>Gold Coast</td>
<td>0.04</td>
</tr>
<tr>
<td>Kenya</td>
<td>0.03</td>
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<tr>
<td>Nigeria</td>
<td>0.02</td>
</tr>
<tr>
<td>N. Rhodesia</td>
<td>0.02</td>
</tr>
<tr>
<td>Nyasaland</td>
<td>0.06</td>
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Notes


Early in the year 1935 reliable news had reached me of how a big burden of unpaid forced labour was being laid upon Africans in Charter District, Mashonaland. Complaints reached me concerning road-making as well as the multiplication of work at dip-tank centres. An outspoken denunciation of the way in which Africans were being oppressed under the authority of a dip-tank supervisor reached me from a European resident in a somewhat remote part of the District.

Not long after receiving this indictment, I wrote a letter, and followed it up by paying a visit, to a Native Department official at The Range, the headquarters of that Department in Charter District. I appealed to this official to stand up for the Africans concerned, but he gave me to understand that the dip-tank supervisor was working under his own supervision and authority, and that the
Africans of our District, who, he alleged to have been idle for years, must do the road-making required of them.

I had come to this District of Mashonaland first in the year 1901, and I had put in some twenty-eight years there of bona-fide residence since my arrival, so I could certainly claim to know it fairly well. In March, 1935, I proceeded to make a personal investigation into that allegation of Unpaid Forced Labour in the area, whence such a stirring protest had reached me, an area that I had frequently visited in years past, in the neighbourhood of the Sabi River. A local Methodist Missionary-in-charge, the Reverend Walter Howarth, proved of great service to me in helping me to carry out my investigation.

After I had obtained much evidence myself by foot-travel, he took me on his light lorry over a great stretch of country, and showed me what an astonishing extension of road-making had been achieved in the course of a few months by Africans (already miserably overtaxed) called out under our Native Department’s authority. The amount of work accomplished must have been a stupendous burden upon those who were called out from their own employments to do it – with their own cattle, their own sledges, their own ploughs, their own hoes, and their own axes, without any regular rationing,* and without any wages whatsoever. I want to submit that it was a public disgrace that this vast multiplication of road-making on the Sabi Reserve, Charter District, and on an isolated adjacent Mission farm, which had been pushed / forward in a few months, should not have been paid for. It was disgraceful that no wages were given, no regular rations supplied, and no remission of poll-tax promised or conceded to the road makers employed. My comrade the Methodist missionary assured me that the new banking-up and ditching of roads policy,* which I saw exemplified,, compared very unfavourably with the old system of scuffling and stubbing of tracks – from a motorist’s point of view. The increased burden of forced unpaid labour, entailed already by the making, and threatened by future upkeep of this new ambitious, if ineffective, roads scheme, is appalling to contemplate.

All needful roads in the Southern Rhodesian Native Reserves ought to be made and maintained by voluntary labour, paid at least fifteen shillings a month, regularly and sufficiently rationed, and efficiently directed by our Public Works Department.

The Southern Rhodesian settler (so lavishly subsidised out of Africans’ poll-tax revenue, as well as out of the Beit Trust) ought surely to find the wherewithal for this reform, which is long overdue now. The African of Southern Rhodesia, harassed by heavy taxation,† juggled out of a fair return for what he grows by Maize Control legislation, impoverished by a Cattle Levy devised to help to pay

* See Preface.
† See Appendix II (not included).
for the Europeans' cattle-export trade, ought not in these days to be left at the mercy of a huge undefined policy of forced labour, a vast additional impost. Will the interests of African Development be pleaded as an excuse for an extortion of forced unpaid labour in Africans' own Reserve land?

I want to ask two plain questions of those people who may plead any such excuse.

(i.) How many African-owned wagons, Scotch carts, or sledges will be allowed to travel freely over (and to impair) these motor-roads made and maintained by Africans for European motorists?

(ii.) How much of the Southern Rhodesian African's miserly allowance of Native Reserves is being whittled away by the abandonment of old tracks, which are left to erosion, and by the multiplication of new motor roads – the unrestricted use of which is grudged, or debarred, to the old-fashioned vehicles of those Africans, who have been sweating unpaid to make them?

In the Preface to the third edition of his book 'Kenya,' Dr. Norman Leys has told us that even the most conservative of his informants 'agree that the payment of labourers on communal work is of prime importance. In a country where most of the workers are paid sixpence a day or less, the requiring of unpaid labour from a single section of the population, and that section the poorest, amounts to slavery.'

In a leading article, dated April 20th, 1935, based upon those revelations as to Unpaid Forced Labour, which "The Manchester Guardian" had printed for me on April 12th, 1935, 'West Africa' (published in England) spoke out strongly to the following effect as to the shameful character of the allegations I had made against Southern Rhodesia, inasmuch as Southern Rhodesia formed part of our British Commonwealth of Nations. – 'It is scarcely necessary to remind people interested, in African matters that one of the strongest counts in the indictment of the Liberian Government by the Christy Commission was the use of forced, unpaid labour. Many comments passed in this country upon the Liberian authorities then responsible have gone so far as to suggest that Liberia, owing to the charges made by the Christy Commission and others, should be deprived of membership of and reliance upon the League of Nations. It is therefore incumbent upon countries which form part of the British Empire to show that they neither impose nor tolerate practices of the nature of those which came to light in Liberia several years ago.

'On general grounds it is to be hoped the Southern Rhodesia Government will make strict and prompt inquiry into the truth of Mr. Cripps' charges. It is a high political interest and a high commercial interest of Great Britain that Afri-

* See Appendix I.
cans under European Administrations in British Africa should be left in peaceful possession of their natural human rights and should be contented and prosperous. But in the case of Southern Rhodesia there are certain special reasons why public inquiry should be made. The country’s Prime Minister frequently speaks as if his Government had hit upon some new and better way of dealing with its African population than other Governments have been able to evolve. Then, the country has just reported a Budget* claimed to be the most favourable in its history, which fact suggests that it could afford to pay the standard wage for Government-directed labour. Further, it is a country which professes great pride in its foundation by Mr. Rhodes and its devotion to his principles. If the case stated by Mr. Cripps is not disproved, it will be no matter for surprise if impartial critics say either that the principles of the founder of Rhodesia were unjust to Africans or that those who to-day govern the country he founded are departing entirely from his principles.

CHAPTER II.

‘An Inquiry Necessary’

THAT leading article from ‘West Africa’, which I have quoted, is headed ‘An Inquiry Necessary’. ‘West Africa’ says of me, the compiler of this pamphlet: ‘When therefore he makes in the ‘Manchester Guardian’ a serious charge against the Government of Southern Rhodesia, that Government will no doubt feel that it cannot with due regard to its own fair fame leave it uninvestigated.’

On May 14th, 1935, the following question was put in the British House of Commons to the Secretary of State for Dominion Affairs, the Right Hon. J. H. Thomas, M.P., by Mr. Mallalieu, M.P.:–

‘Whether his attention has been drawn to the fact that the natives of Mashonaland, Southern Rhodesia, are now being subjected to compulsory labour for the making of roads without receiving any payment of wages or rations whilst at work and without any remission of poll-tax; and whether he will say under what legislation this labour is being exacted?’

To this question Mr. Thomas is recorded to have replied as follows:–

‘I have made inquiries and understand that certain roads, of about twenty-four miles in extent, are being constructed in one of the reserves of Mashonaland in order to give better access to dipping tanks and so attract purchasers to whom the natives may sell their cattle. These roads have been made by native cattle owners at the suggestion of the dip-tank supervisor. No compulsion has been used and no complaints have been received from the natives.’

* See Appendix III (not included). /
Did this answer refer to recent happenings in my own District of Charter, Mashonaland? If so, it contained two bare-faced terminological inexactitudes.

I allege that wide-spread compulsion has been used here, and that complaints have most certainly been received from our local Africans.

Moreover, I allege that our dip-tank supervisor, who acted as the compelling European agent, received his compulsive power from the local Native Department Office of our Government.

In the ‘Manchester Guardian’ of June 26th, 1935, I wrote: ‘Southern Rhodesia is a large country containing many native districts. I profess to know only one native district comparatively well, the Charter District of Mashonaland, and I allege that / the information given by Mr. Thomas does not fit the facts as to that district. If the Government of Southern Rhodesia does not see its way to grant an impartial inquiry into the allegations I made as to unpaid forced labour in this district, I hope to publish and to circulate a pamphlet entitled ’How Roads were made in the Native Reserves of Charter District, S. Rhodesia, 1934–5’.”

Such a Government Inquiry as I suggested has not been afforded to me. About the end of August, 1935, I was told by a Chief Native Commissioner, who has recently come into office, that he could not well afford me such an inquiry, since his doing so might seem to reflect on his predecessor in office (who was supposed to have made some sort of an inquiry into the matter concerned on a brief visit that he paid to Charter District about April, 1935).

If the information referred to in the British House of Commons emanated from that predecessor, who is now out of office, and was meant to refer to this district of Charter, wherein I am now residing, I repeat that it does not fit the facts, as I know them. I repeat that wide-spread compulsion has been used in Charter District, and that complaints have most certainly been received from local Africans, domiciled in Charter District. In my next two chapters precise information may be found as to compulsion having been used, and as to complaints having been made.

CHAPTER III.

How Compulsion was Used in the Charter District

SINCE the information, which I have quoted, was given in the British House of Commons, on May 14th, 1935, I have made personal researches far and wide in Charter District, supplementary to that research which I had made in the Sabi Reserve neighbourhood, and reported in my letter of April 12th to ‘The Manchester Guardian’. I have found evidence as to an imposing amount of Unpaid Forced Labour having been exacted in the period 1934–5. The extent of the new road-making in that Sabi area, which I investigated in March, 1935, may have
been about 24 miles in extent, but I have found that that road-making is but a portion of a far-flung scheme of Unpaid Forced Labour superimposed upon our Charter District’s Native Reserves by a certain dip-tank supervisor under the authority of the Native Department’s Office at The Range in the Charter District.

I found that this dip-tank supervisor did indeed come about last June, some time after that misleading (not to call it utterly disingenuous) explanation had been given in Parliament as to unpaid road-making in Mashonaland, to one particular centre of Africans, and remark that the roads which he had set them to make were for the purpose of getting cattle-buyers to buy their cattle. Elsewhere I have found no trace of this explanation having been given by him to Africans, however tardily. I suggest that this explanation may have been an after-thought, as far as he was concerned. In June, 1934, some time before the pressure of Unpaid Forced Labour, so far as I can estimate, reached its height in our District, the whole District without exception, was, I believe, closed to the movement of cattle – a local outbreak of African Coast Fever having been discovered. I remember putting the question in March, 1935, to an African dip attendant as to when he had last seen cattle-buyers at the dip which I found him to be serving, and being told that it was at a time earlier than that when our Coast Fever quarantine came into force. I have heard from a European source that quite another explanation has been given by the dip supervisor of his road-making activities – that he has alleged his desire to free Africans from the extortionate tyrannies of local traders. But I do not think that either the one explanation or the other is of very much importance, or to be taken very seriously. The fact remains that the dip-tank supervisor, backed by the local Native Department, forced an astounding amount of labour from Africans, who had cattle to dip, in that region of Charter District and Buhera Sub-District which was under his control, using African dip attendants as his agents or overseers. I feel no reasonable doubt, after making extensive and intensive researches into the history of his proceedings, that in his policy of bluff he used threats of gaol. I believe in the general accuracy of the report given to me in the Manyene Reserve of Charter District as to this dip-tank supervisor having proclaimed: ‘Ndini ishe doktera we mombe: yitayi basa re road: kana musingayite basa ndinokuyisayi mu torongo.’ This proclamation, being interpreted, means: ‘I am the Chief, the Cattle Doctor: do the road-work: if you do not do the work, I will put you in gaol.’

Mr. Thomas told the British House of Commons that, according to his information, no compulsion was used. At a Paramount Chief’s centre (in the Mondoro Reserve of Charter District), when I was investigating our Unpaid Forced Labour scandal, an African used an argument that appeared to me to go straight to the root of the matter. He asked a question of this kind: ‘If we were not forced, should we be punished?’ Here is an instance of the sort of punishment inflicted.
I allege (and I offer evidence in support of my allegation) that a brother of this same Paramount Chief was punished for absenting himself from work on the road, when other people went to that work, by being sentenced to work in a dip-garden.

I allege that another man of the same Chief’s people, who had been looking about for lost cattle, and so had absented himself from road-work, was punished by being given a week’s roadwork. I submit that a woman in the same neighbourhood, whose husband was alleged to be looking for Tax, was penalised for a day. And so on, and so on.

I offer evidence that in this particular Reserve (from which I have been drawing these particular instances, that I have given of the penalising of defaulters) the rule was that, if a man were sick, his wife must be sent; if she were not sent, he must work when he got better. In the Manyene Reserve, not very far from where I live, I submit that I have evidence taken in the presence of a Paramount Chief that the rule there was apparently that, were a man away, his wife or child must take his place at road-making. An African, whom I know intimately, who lives and owns cattle upon a Native Purchase area – dipping his cattle at a tank on the Manyene Native Reserve – has told me that at one time his daughter acted as his substitute in his absence from home.

One of the most sinister features of the whole had business appears to have been the use of women’s labour, while their husbands were away at work, or seeking their tax-money.

The dip-tank supervisor worked his Unpaid Forced Labour scheme by means of African dip-attendants, through whose hands those dipping cards passed, on which the numbers of the various African owners’ cattle were entered. Each card-owner might be warned to complete a strip of road, about fifty yards in length. One dip attendant assured me that he only allowed a woman to help her husband on a strip, but not to take over a strip, when the husband was not available, but I am offering evidence to prove that all our Charter District dip attendants were not so scrupulous. (In both a Reserve to the west of Charter District, and in another to the east of the same District, I have gathered this evidence of mine.) I assert that, through the custody of their cattle-tickets, leverage of a bluffing kind has been brought to bear upon our Africans in Charter District to bring them out in wholesale fashion for Forced Unpaid Labour, both labour for road-making, and also labour at dip-tank centres.*

By the machinery of the Adult Male Africans’ Registration Certificates, native labour for wages is regulated, and coerced from / desertion before the periods of labourers’ contracts may have expired. By the machinery of the African cattle-owner’s dipping ticket (used with a liberal amount of bluff by some

* See Appendix IV (not included).
dip-tank official – acting as the Native Department’s go-between) a vast amount of labour has been secured by the Native Department of our Charter District in Mashonaland, without money and without price.

The son of a Paramount Chief pointed out his view in my presence that the dipping ticket was a second Registration Certificate. I think that I understand what had prompted that view, to which he gave such significant expression. Surely the vague menace of being refused back one’s dipping list of cattle by a dip attendant, who represented a dip-tank supervisor with some reputation for rough dealings* at dips, who in his turn represented the Southern Rhodesia Native Department, may have proved wondrously successful in extracting Unpaid Forced Labour among the very submissive African cattle-owners inhabiting Mashonaland.

Assuredly it may have been found an easy task to bluff them thereby into surrendering their services on a gigantic scale to further an organised scheme of unpaid navvying. In certain places a great amount of raised roadway was substituted for old tracks. Not only the African people, already taxed almost out of existence as individuals, but the people’s cattle,† axes, hoes, sledges, ploughs were commandeered for communal work on roads, or on dip tanks’ embellishments. One African gave testimony that he had used twelve cattle for a day’s work with an iron road-smoothing apparatus. I maintain that such use of man’s and cattle’s labour without wage reflects little credit on that Native Department, under whose authority he was employed. In Kenya, so we have been told, communal work was required by law from Africans, who preferred their own free village life to plantation life as wage-earners for Europeans.‡ Here in our Charter District of Southern Rhodesia I submit that I have found evidence of the communal labour of road-making having been exacted from women while their husbands have been busied with the business of wage-earning or Tax-seeking. It is an outstanding disgrace, I maintain, to that district of Mashonaland wherein I have made my home for so many years now, that Unpaid Forced Labour should have taken the repulsive shape that it did in the period. 1934–5.

CHAPTER IV.

How Complaints were Made in Charter District

THE Right Hon. the Dominions Secretary told the House of Commons that, according to his information, no complaints had been received from the Natives about that road-making in Mashonaland of which he spoke. I allege that in

* See Appendix VI (not included).
† See Preface.
‡ See Appendix I.