Architecture of Schools
Architecture of Schools
THE NEW LEARNING ENVIRONMENTS

Mark Dudek
Contents

Foreword by Bryan Lawson vii
Preface ix
Acknowledgements xi
Introduction xiii

Part A Education and the Environment
1 Origins and significant historical developments 1
2 The educational curriculum and its implications 41
3 Making the case for architecture in schools 72
4 The community in school and the school in the community 101

Part B Case Studies
1 The Speech and Learning Centre, Christopher Place, London 133
   Troughton and McAslan
2 Seabird Island School, Agassiz, British Columbia 138
   Patkau Associates
3 Strawberry Vale School, Victoria, British Columbia 141
   Patkau Associates
4 Westborough Primary School, Westcliff-on-Sea, Essex 145
   Cottrell and Vermeulen
5 Woodlea Primary School, Bordon, Hampshire 148
   Hampshire County Architects
6 Anne Frank School, Papendrecht, The Netherlands 153
   Architectuurstudio Herman Hertzberger
7 The Bombardon School, Almere, The Netherlands 159
   Architectuurstudio Herman Hertzberger
8 Pokesdown Primary School, Bournemouth 163
   Format Milton
Contents

9  Ranelagh Multi-Denominational School, Ranelagh, Dublin 168
   O'Donnell and Tuomey
10  Little Village Academy, Chicago, Illinois 172
    Ross, Barney and Jankowski
11  Saint Benno Catholic Secondary School, Dresden 178
    Behnisch and Behnisch
12  Haute Vallée School, Jersey 184
    Architecture PLB
13  Elementary School, Morella, Spain 189
    Carme Pinós
14  Admiral Lord Nelson Secondary School, Portsmouth, Hampshire 193
    Hampshire County Architects
15  Heinz Galinski School, Berlin 200
    Zvi Hecker
16  North Fort Myers High School, Florida 209
    Perkins and Will
17  Albert Einstein Oberschule, Berlin 214
    Stefan Scholz
18  Barnim Gymnasium, Berlin 220
    Stefan Scholz
19  Odenwaldschule, Frankfurt 224
    Peter Hübner
20  Waldorf School, Chorweiler, Cologne 226
    Peter Hübner

Index 235
Foreword

Professor Bryan Lawson

Of all the projects an architect can be asked to design, none can be more interesting and challenging than the school – in which the most important of all human activities, the education and development of our children, takes place. That activity is simultaneously purposive, planned and controlled, and yet also subtle, delicate and easily disturbed. We know precisely what we want to achieve in a school and yet we are clearly uncertain as to how it should be realized. Critically, the success of education depends so much on the quality of the pupil/teacher relationship. This then requires an architect who is sensitive to human relationships and aware of how to promote and foster them through the built environment.

Schools have many stakeholders, from the pupil to the teacher, from the caretaker to the head, from the parent to the governor. These various participants tend to have different levels of involvement in the briefing and design process and to have unequal influence. Characteristically those furthest removed from the architect during design may be the most vulnerable to bad design. The great Dutch architect Herman Hertzberger has a reputation for a very humane approach to architecture and for taking at least as much of an interest in the occupants of his architecture as the buildings themselves. He is known for his Apollo schools in Amsterdam and it must have been the experience of working on these that led him to tell me: ‘... I prefer for instance to make a school over making a house, because the house I feel has too much of a constraint to just follow the particularity and idiosyncrasy of just one person or a couple. I prefer to have a school where you have a board, you have teachers, you have parents and you have the children, and the users are all of them.’

Recently a group of my students have been trying to extend and re-order an existing inner city school. On the site were buildings constructed over a period extending from the Victorian era to the 1960s. These buildings revealed not only changing architectural styles, but also, more fundamentally, changing values about the school itself. The Victorians with their pride in the institution and their obsession with natural light and fresh air built classrooms now too formal, large and high for modern needs.

By contrast the 1960s was a period in which flexibility was thought to be important, but the architectural result was placeless and uninspiring. So there are many ways to get a school wrong. Of course my students found even more ways of being wrong, but also some ways of being right too! For each of us, the school is such an important part of our own personal history that it may be difficult to imagine a school any other way. It is of course the job of architects to do just that, and yet also to understand what is good about what has gone before and to interpret this good practice in a contemporary way.

This is only likely to happen if we first establish some sound theories about the building type. Mark Dudek has studied the children’s environment now for many years. He has shown us how important the environment, and specifically the architectural environment, is to the child’s development. His previous book on the Kindergarten has become widely read and recognized as a major contribution to the field. Mark combines design practice with research and teaching and has used all three activities to develop both scholarship and sensibility about this complex area. This book, then, continues that combination in a rather special way. It provides a scholarly account of the history and changing values about education and how these have been reflected in the architecture of schools. It shows the development of the school as a building type. It provides ideas and guidance for the practising architect.

Recently there has been some debate about the nature of architectural research and what specifically constitutes architectural knowledge. Mark Dudek demonstrates here just how design can contribute to our understanding and knowledge. He shows, evaluates and compares many innovative and progressive pieces of school design. He tests them against theories of education and developmental psychology, as well as against more generic architectural ideas. Most importantly he also shows us how, through the practice of architecture, we can imagine places and ways of relating adults to children. It seems to me that architectural knowledge has to advance by just this sort of work.

University of Sheffield
The role of education within society has always been important. Today, the function of school architecture in that process is less obvious. Successive governments have failed in this area. Now, at the beginning of the new millennium, the evidence of this neglect can be seen in numerous badly maintained buildings, so-called ‘reception classes’ for the rising fours accommodated in lofty Victorian classrooms, inner city secondary schools with little or no external recreation space, and generally overcrowded, noisy classrooms. These and other anomalies are the result of a sustained period of neglect of the state education system.

One is almost tempted to describe it as wanton neglect by successive UK governments. And who is to say that this wasn’t a deliberate policy of ‘dumbing down’? In the immediate post-war years, many viewed education as a bridge between relative poverty to material and intellectual well-being. During the 1980s it is possible that the aim had been to allow or even to encourage the fabric of the state education system to run down. If the sons and daughters of cabinet ministers in charge of education policy were catered for in the well-funded private sector, why should the state make any more than adequate provision for the rest?

Apart from the obvious need to provide guidance on the design of environments for education, why embark upon such a lengthy exploration of school architecture? The answer lies partly in my own personal experience, which in hindsight is worth relating: the first school I knew comprised a series of temporary wooden huts built just after the Second World War. The transmission of noise from adjacent rooms, the unpleasant aroma of lunchtime cooking emanating from the galley kitchen, the hard exposed playground areas were a sudden, chaotic transformation from the relative order of my home environment. My senses became so heightened to the atmosphere that developing a critical response to any new environment became easy from a very early age. Trying to learn how to read and write in such an environment was another matter.

Perhaps the most disturbing effect of this was a sense of impermanence. If this was the message communicated by

the spaces we were to inhabit for over a third of our waking lives, how could we develop our own innate sense of esteem and security? What brought this home even more profoundly was the change of school environment experienced around about the age of seven. A new purpose-built school was provided to replace the ageing huts. The effect this was to have on my sense of well-being was inestimable.

The new school within its own secure site had classrooms with solid walls and large openable windows, providing views onto the playing fields beyond. Each classroom had its own lavatories and cloakrooms. There was a multi-purpose hall with a sprung beech floor. The sign which read ‘No Stilettos Heels’ added an exotic touch which lent to that space a symbolic significance in my mind; it asserted the value of the architecture placing the needs of children over and above those of adults. Perhaps as a direct effect of those bright, spacious classrooms and the green spaces in which to run around at break times, my academic performance and my health improved in equal measure; the effect of a truly therapeutic environment.

That school had a particular architectural form which, on the evidence of a recent return visit, has endured the thirty or so years since it first opened. More about that aspect later in the text. For the moment it is interesting to speculate on the effect that new building may have had on me and its other alumni. Of course the staff in that new school must have been responsible for much of my newly discovered sense of well-being. However, for this particular old-boy, it was the architectural qualities which made all the difference. The quality of that school environment, its aromas, textures and colours, the ordered rituals it reinforced, all fixed within me a measure of my own value.

Despite this, different priorities now apply. Colleagues comment on my professional interests and the way in which they appear to follow my own children’s progress through the education system. In this respect my motivations are clear. This interest reflects the crucial importance to me of my family and their well-being. Today the role children play in the lives of many people is accentuated in
a similar way. Part of the reason for this is explained by Ulrich Beck, when she talks of children as the focus of stability, 'the port in the storm' which the stresses of contemporary family life cry out for: '... Doting on children, pushing them on to the centre of the stage – the poor over-pampered creatures – and fighting for custody during and after divorce are all symptoms of this. The child becomes the final alternative to loneliness, a bastion against the vanishing chances of loving and being loved. It is a private way of “putting the magic back” into life to make up for general disenchantment. The birth rate may be declining but children have never been more important.'

Perhaps it was always thus. However, it seems that we are living in times of great social change, where for large sections of the community the nuclear family of my youth is no longer the norm. People can easily become isolated and disconnected from their family roots. For various reasons, many parents, particularly fathers, spend extended periods apart from their children. The care and education they receive from others can quite rightly become an obsession.

Quotation from The Normal Chaos of Love
Ulrich Beck and Elizabeth Beck-Gernsheim,
Polity Press, 1995, p. 37
Acknowledgements

This project has been directly supported by the School of Architecture, University of Sheffield. Latterly, much of the research work was carried out with, and by, diploma students in Studio Three. This enabled a deeper understanding of school architecture to emerge. I would like to thank all who assisted in its difficult gestation and belated delivery, particularly Marie Milmore at Architectural Press.

My thanks also to those schools which allowed me to observe and learn whilst visiting, especially the following: The Good Shepherd Primary and Eskdale Primary, Nottingham; Cleves Fully Inclusive School, London; The Admiral Lord Nelson, Portsmouth; Wisewood Secondary, King Eckbert’s Specialist School and Mosborough Primary, Sheffield; and the Albert Einstein Oberschule, Berlin.

I would also like to acknowledge the help of the following people, without whom this publication would not have been possible: Andy Thompson at the Architects and Buildings Branch, Department for Education and Employment, London; John Waldron at Architecture PLB, Winchester; Richard Jobson of Whitby Bird and Partners; Andrew Beard, Sheffield City Architect and Hilary Cotnam, Architecture Foundation (see Chapter 4); Melanie Evans; Annabel Yonge and Andrew Mortimer; and all the architects who have provided material both for chapters one to four and the featured case studies.

My special thanks to Kenneth Macdonald, who once again gave me the wisdom of his architectural insights, and Dr Helen Penn who provided a similar and often critical appraisal with regards educational theory. Finally I would like to mention my mother who died suddenly during its research in October 1997. She taught diligently for 25 years at the same primary school in Nottingham. She dedicated great care and attention to the well-being of countless children. It is to her that I dedicate this book with great love.

Mark Dudek
Introduction

Education and its exemplification in buildings and environments has always been concerned with radical ideas set in new and stimulating settings. It had to be radical because it was a system of mass education, constantly reinventing itself to provide more and more educational places of an ever-improving quality.

The roots of an architecture for mass education can be traced back to the mid-nineteenth century, represented by Arts and Crafts movement board schools. In Europe a similar, albeit more monastic, route can be discerned going back even earlier. The original church-based models which comprised children surrounding, and by definition subservient to, a master, gave shape to today’s private and grammar schools both within the UK and further afield. Other educational milieux such as the domestic home environment (explored in the introduction to Chapter 1), the institutional workhouse, or even the prison, helped to provide the pattern for state schools during their early development.

Where the public school tradition suggests architectural forms which were solid, dependable and largely uninspiring to the pupils, the new school buildings for mass education in the twentieth century would be light, airy and practical. Thus right up to the 1970s, two opposing styles continued to be used side-by-side in the design of new school buildings: traditionalist schools in a reduced neo-classical style and the modernist inventions of the Bauhaus pioneers. For a time, the blossoming of exciting new forms of school architecture not only transformed the image of education but also affected the perceptions of all who inhabited those new structures.

Inevitably, these developments carried with them some of those earlier influences to create hybrid forms combining new and traditional ideas. Both the radically new and the hybrid form of twentieth century school building will be explored in terms of the experimental technologies employed and the educational systems they reflected. I will pose the question, how far did the planning and conceptualization of the ‘hybrid’ school buildings dictate the pedagogy? How did the evolution of the modern school bring about more humane environments for learning? What lessons do these precedents hold for the current generation of school architects, as the educational curriculum moves away from the child-centred approach?

The design of school buildings is viewed here as a particularly specialized field encompassing ever-changing educational theories; I will illustrate in the historical sections how the best early school architecture was often a close representation of the pedagogic needs of educators of the time supporting their chosen educational curriculum. Similarly the role of the contemporary school designer should go some way towards interpreting and anticipating the specific needs of new learning methods. Therefore I include an extended section on the curriculum, focusing on current educational debates taking place particularly within the UK. It is of fundamental importance that any school designer should anticipate the evolving nature of education within society and make provision for it in their architecture.

During recent years progressive or modernist educational methods have been questioned in Japan, the United States and Europe. This process is currently taking place vigorously within the UK. With it comes the need for new and refurbished school premises. It is evident that school building comes about as political and economic transformations force change and modernization in roughly 35-year cycles. The last such phase, again precipitated by a reforming Labour government, encapsulated an ideologically driven political climate. In 1964, Harold Wilson referred to ‘the white hot heat of technological change’ which celebrated experimentation. This spirit was implemented through the adoption of new building techniques and educational practices, with the consequent construction of thousands of new schools; ultimately, some would say, with mixed results.

There is a parallel to be drawn between the great modern movement architects and twentieth century progressive educationalists in that their theories are currently subject to radical re-appraisal. In architectural terms, this is due to an evident failure of these lightweight
modernist structures to modify and control the external environment and maintain comfortable teaching conditions even within, let alone beyond, their expected lifespan. However, the diminution of radical technologies is also due to a devaluation of progressive ideas generally. For a number of years, this was manifested by an approach to teaching which emphasized the process and the experience of education over and above the acquisition of knowledge and practical skills for their own sake. This is gradually being replaced by a more factual content-based system, as exemplified by the 1988 Education Reform Act. This is perhaps more market driven, demanding constant evaluation of pupil and teacher performance, and the buildings which go with it.

The need for school architecture to respond in a progressive way to social transformations is accentuated during times of political change. The challenge is to prevent radical ideas from derailing the evolutionary process which guides the development of design for education. Nevertheless, this constant quest for modernization can be seen in almost every industrialized country. For example, the requirement to provide support for working women is perceived as a relatively recent phenomenon. It is widely agreed as being a necessity and implies an extension of care and education downwards and sideways. Downwards to provide for young children and even babies within universally understood quality thresholds. Sideways to provide breakfast clubs and after-school facilities for school-age children to support family conditions which currently prevail.

The radical nature of these changes and the effect they will have upon the development of young people should not be underestimated. They are potentially cataclysmic. The prospect of such change sends many commentators rushing for the safety of bygone times and their outmoded ways exemplified by more traditional teaching methods. This is a mistake. To borrow an image from Max Weber, talking about this reactionary quest to return to the mythical ideals of the 1950s nuclear family: "modernization is not a carriage you can climb out of at the next corner if you don’t like it. Any one really meaning to restore family conditions as they were in the 1950s would have to turn the clock back. This would entail not just indirectly keeping women away from jobs by subsidizing motherhood or polishing up the image of housework, but openly denying them opportunities and education."  

Profound transformations can be anticipated in areas such as the use of information and communications technology and its effect on staffing levels in schools, building ecology, the classroom environment and many other areas of the agenda. At times of change such as these, teachers, carers and their voluntary helpers become particularly stretched. The need for supportive multi-functioning environments of the highest quality become essential constituents in the smooth implementation of new practice. I approach this project with a belief in this progressive philosophy and the significance of the environment in the educative process. I direct the case study section towards state of the art design, across a range of international contexts.

This publication focuses particularly on the primary and pre-school sector, although the subtle spatial and psychological requirements of growing children up to, and beyond, the age of sixteen is broadly considered. Chapter 1 focuses on history, origins and significant historical developments, and incorporates a general overview which illustrates the link between progressive educational ideas and experimental architecture. This tendency can be seen particularly during the early post-war years when architects such as Alvar Aalto, Denys Lasdun and the Smithsons first made their mark as designers of new school buildings, reflecting social and educational transformations of the period.

Chapter 2 is largely devoted to the classroom environment. This area of the school is often referred to as the ‘home base’. It is where most time is spent, particularly during the early primary years. The concept of an ‘ideal classroom’ and its relationship to the UK national curriculum is explored. A format where the teachers can contribute to its form and functional make-up prior to its interpretation by a design architect is explained. This process enables an educational and architectural convergence to emerge.

In addition I take the view that the comparatively recent discipline of environmental psychology is important in its encouragement of spaces which themselves further the development and learning of the child through his or her comprehension of space. Therefore a consideration of more esoteric factors such as the effects on behaviour of colour, light and texture will be woven into the more practical aspects of designing for comfort, health and education. Debates about the philosophical role of the school environment are touched upon. Should school environments for children serve certain common functions with respect to children’s development, to foster personal identity, to provide opportunities for growth, to promote a sense of security and trust and to allow both social interaction and privacy? If so, how?

In Chapter 3, I consider the design of schools within a wider architectural and political context. Within the UK the whole subject of education has taken on a new significance, and some of the best new examples of school architecture are analysed and discussed within the context of the contemporary debate. It is hoped that educationalists as well as designers coming to this subject afresh will gain a deeper understanding of the theories which dictate the
Introduction

sometimes baffling moves architects make within the privacy of their drawing studios.

Chapter 4 concentrates on issues which come outside the confines of the classroom. This includes a consideration of environmental factors defining healthy comfortable buildings for education. The functional differentiation of spaces such as the assembly hall is analysed so that readers can make up their own minds as to the most appropriate form and type. It is also considered how best to optimize the external environment in order to improve the educational opportunities. Finally, the structure of school funding within the UK is set out, to provide architects and their clients with the knowledge to initiate improvements to their own buildings, as the concept of the local management of schools becomes a reality.

Part B of this book analyses a series of school or educational buildings in diagrammatic and visual terms. Although the content of the Case Studies is structured pragmatically, with comparative analysis on different technical aspects, the selection of the twenty examples featured is based on my own subjective view; namely those buildings that I consider combine the highest aesthetic and technical qualities. It is true that the size and material nature of new school buildings, particularly in the state sector, is increasingly dictated by limited budgets and public accountability, which largely negates the possibility of architectural experimentation. However, it will be seen how wit and imagination applied in a discerning manner can be every bit as inspiring as the cutting-edge technologies which were adopted in previous eras.

Equally, architectural aspirations can sometimes be blunted by the involvement of community groups, who play an increasingly significant role in the designation of new school buildings. However, the work of architects such as: Cotrell and Vermeulen; Nev Churcher and Michael Keys working at Hampshire County Architects; and Richard Jobson at Architecture PLB show that by adopting an inclusive approach to consultation with teachers and involved parents, inspiring educational buildings can be created which do not step outside the prescribed economic and legislative framework. Indeed, it will be seen how the consultation process can be a positive and binding factor in the creation of new educational environments.

One architect I spoke to during the course of this research expressed frustration at the redundancy of the special water feature she had designed. Considering the distinct ages and varying sizes of the children, she had set three washing-up sinks side-by-side at varying heights within a common area, the lowest sink being for the youngest children. She had imagined how appealing it would be to see three differently sized children together using appropriately positioned sinks. Unfortunately, from the outset even the smallest children refused to use the lower sinks. Instead, no matter what their height, they all opted to use the highest, and therefore the most adult installation.

This anecdote is not recounted to dissuade architects from adopting novel approaches to the design of children's environments; merely to stress that easy sentiment should be avoided. Overly playful ideas may merely patronize the natural aspirations of children to behave in a grown-up way within the school setting. In Disneyland, anthropomorphic references are in the form of teddy bear door handles and plastic animals. Children relate to these forms instantly. They may feel totally at home in Disney-esque and other prescriptively childish settings outside of school times. However it leaves little to the imagination. The shapes are too obvious and direct ... whereas animal shapes can be represented in a more abstracted way, thus open to imaginative interpretation. In the best new learning environments, children recognize education to be a serious business, relating themselves to the group dynamic in a complex series of self-conscious social interactions. New learning environments should reflect the studious aspirations of pupils and teachers.

Architecture of Schools is intended to be a celebration of imagination and diversity within the framework of a rigorous understanding of children and their developmental needs. I do not set out to produce a 'design guide'; rather I feel that good school design evolves out of a complex set of variables which are in the main unique to each regional and social setting. For example, the section on designing the ideal classroom applies specifically to its own staff and its particular east London context. However, I believe that the process which helped to bring this design to fruition is broadly applicable. The quest is how best to respond to these conditions and create an architecture which optimizes creativity and deepens understanding within each child.

To paraphrase Newton's Second Law of Mechanics, every action promotes an equal and opposite reaction. Architects are usually the final arbiters in the choice between different - often competing - priorities when designing school buildings, providing realistic guidance to assist in this complex ordering process. I illustrate that the high aspirations of the community, working with ambitious and knowledgeable design teams, can produce enchanting environments, within existing budgets. I hope to disclose the factors which help to encourage this symbiosis, and provide a framework to interpret creatively the rules and regulations which must guide the contemporary architect.

The intention of this book is to present an international survey of the best in contemporary school design. Naturally I touch upon aspects of the debate in regions throughout Europe and the USA. It becomes apparent, however, that
the primary focus within the text (Chapters 1-4) is the UK scenario. This is an inevitable response to a political climate which has brought the condition of schools, and the state education system, to the forefront. I believe the debate holds valuable lessons for anyone designing or commissioning new schools, wherever they may be.

Although the theoretical chapters focus in the main on the UK education debate, the case studies are international in scope, exploring the 'state of the art' in current new school design. It is accepted that, in reality, most school development within the UK will take place in and around existing school sites. The case studies, therefore, focus on both new schools built over the past decade and significant new extensions to existing premises.

The word 'environment' is used to define the total space within which children learn, not just architecture and landscape architecture. This implies an integration between equipment and furniture, buildings and the urban, suburban or rural context within which schools are located.

Throughout the text I am concerned with provision for mass education within the state sector. However, I make reference to some private provision, as relevant exemplars.

Notes

1 It is important to recognize how early educational ideas spread beyond the present somewhat parochial regional or national systems. The ideas of early educators such as Froebel, Pestalozzi and Dewey had a profound influence on the developing practice of education throughout the world. Today educational theory is disseminated within academic circles by way of the Internet, publications and international conferences. However this elevated academic sphere appears to have little direct impact upon the everyday practice of education, which is driven by a more pragmatic ethos. This often focuses upon health and safety legislation at the expense of imagination and experimentation.


3 To every action there is always opposed an equal reaction: or the mutual actions of two bodies upon each other are always equal and directed to contrary parts. Isaac Newton, Principia Mathematica.
Part A

1

Origins and significant historical developments

Introduction

The naturalistic settings sought for education at the beginning of the century, seen in early examples such as the open-air, Steiner and Montessori schools, all carried within them themes which run throughout the history of twentieth century school architecture. Initially viewed as an issue relating merely to hygiene and the spiritual well-being of underprivileged children in the newly industrialized cities, the desire to make the experience of education more suitable to young children broadened to encompass other concerns. From the 1920s these included a growing interest in child psychology and a more enlightened approach to the educational needs of large pupil numbers within the expanding cities.

To balance these radical impulses, it can be said that the more privileged private education systems tended to maintain an approach to buildings for education which deliberately set out to make them institutionalizing in their own right. This could be seen particularly in the English public school tradition, where strict hierarchies were reflected by an architecture which changed little within the intervening decades of the nineteenth and twentieth centuries. How to de-institutionalize the institution can be seen as a significant topic within the evolving theory of school design elsewhere.

Within this chapter I explore some of the more enduring themes represented by both the radical and the traditional wings, viewed through the most influential buildings and architects. I do not set out to present a detailed account of the history of school architecture. Rather, I describe some of the recurring educational and social concepts which enabled architects to respond in specific and distinctive ways to the needs of children in mass education.

To begin I consider briefly the roots of an architecture for education, not by way of the first dedicated school buildings, but within the framework of an anthropological view of space as defined by Edward T. Hall and his analysis of the house:

People who 'live in a mess' or a 'constant state of confusion' are those who fail to classify activities and artefacts according to a uniform, consistent or predictable spatial plan. At the opposite end of the scale is the assembly line, a precise organization of objects in time and space.1

Hall's dialectical arguments may quite easily refer to contemporary school design, which has reached a point where rooms and spaces are intended to meet precise functional needs, and the function of school is framed in neat periods of time, dedicated to specific subject areas. If a modern secondary school comprises as many as twenty specific areas for teaching (aside from numerous smaller ancillary areas), although the outcome of education may be predictable, it also suggests that the range of activities is encouraging a broad and interesting form of education, which nevertheless encompasses large measures of control. It is, however, far removed from the monofunctional spaces of the factory floor or, as we will see, the first schools with their provision of large schoolrooms in which hundreds of children could assemble for instruction at one time.

The implication of Hall's analysis of function relating to the house, where there are special rooms for special functions, does however determine a modernist conception of how people should live their lives. Rooms in the house are allocated specifically to cooking, eating, lounging/entertaining, rest, recuperation/procreation and sanitation. These are functions so precise that they might set the agenda for life. They can impose mental straitjackets. Life is framed by the environments within which it is set; an order is established levelling and stultifying the possibility for wider social interaction, the source from which education springs. Seen in these terms, there is little or no possibility for the form to be interpreted imaginatively. If the
Tehtaanmäki Elementary School, Anvalankoski (formerly the County of Inkeroinen), Finland. Designed by Alvar Aalto in 1938, view of the double height entrance hall with second floor balcony. The foyer level is in fact a raised ground floor due to the sloping site with a gym and changing facilities at the ground/basement level. The architect was absent from the construction, overseeing the development of Villa Mairea and the Finnish Pavilion; however, it is an important example of school design in the early modernist style which subsequently became very influential. (Photograph courtesy of Anjalankosken Sanomat. The plans were drawn by Susanna Salmela.)
Figure 1.1b
Plan of ground floor.

KEY:
1 Gymnasium
2 Girls' locker room
3 Showers
4 Boys' locker room
5 Fuel room
6 Electricity control room
7 Boiler room
8 Cellar
9 Storage space
10 Cellar
11 Head cook's apartment
12 Bedroom

Figure 1.1c
View towards double height entrance hall with the main classroom block on the right.
Figure 1.1d
Plan of third floor.

Figure 1.1e
Plan of second floor.

KEY:
1 Classroom
2 Classroom
3 Classroom
4 Teachers' lounge
5 Classroom
6 Classroom
school is based upon a similar mono-functional model to the house, it may also have a negative effect on the personal development of the child.

Dutch architect Herman Hertzberger, who has made a significant contribution to the architecture of schools, puts it this way: '... a thing exclusively made for one purpose, suppresses the individual because it tells him exactly how it is to be used. If the object provokes a person to determine in what way he wants to use it, it will strengthen his self identity. Merely the act of discovery elicits greater awareness. Therefore a form must be interpretable – in the sense that it must be conditioned to play a changing role.' This defines the essential dialectic at work within the history of school design during the nineteenth and the early part of the twentieth century: on the one hand, the urge to impose discipline and control through a resolute set of spaces; on the other, the emerging desire to encourage individual creativity by the production of buildings which were not enclosing and confining. Rather they opened themselves up to the surrounding context, its gardens and external areas, which themselves became a fundamental part of the 'learning environment'. Social interaction, rather than autonomous isolation, became the educational strategy embodied in Hertzberger's influential school buildings of the 1980s.

As with the school, the house as a functional layout with a deterministic programme, which is now taken for granted, is a relatively recent interpretation. Philippe Aries' *Centuries of Childhood* points out that rooms in European houses had no fixed function until the eighteenth century. He asserts that, before this time, people came and went relatively freely within dwelling
Architecture of Schools

Figure 1.2
Geography lesson at Alma School, 1908. (© GLC.)

houses. Beds were set up whenever they were needed. There were no spaces that were specialized or sacred. Certainly there were no rooms or buildings dedicated to the education and development of younger children. The 'school', for most children of the middle ages, was the everyday world they inhabited.

Nevertheless, in eighteenth century western societies the home began to take on characteristics of its present form. Rooms were identified as being bedrooms, dining rooms and kitchens, each having their own function. Furthermore, the concept of the corridor came into being. This was a rationalization of the communal meeting place (around the entrance) or hall, which had been the original all-purpose living/sleeping/eating area. The corridor enabled private activities to evolve and the house took on the form of an internal street, with rooms arranged in an orderly form along either side. The children's playroom or nursery would often double as their sleeping area, enabling children's games to develop and evolve over extended periods of time.

Often it would be treated as a private territory, a little house in its own right. The room was a secure microcosm of the home itself, with its own social hierarchies played out between brothers, sisters and childhood friends. It would become an important mechanism in the development of social competence, safe from the outside world yet capable of replicating some of its difficulties and complexities. According to Hall, man's knowledge and control of space, which he describes as being 'orientated' is a fundamental characteristic of this social development. Without this sense of control of one's environment, to be disorientated in space, is the distinction between survival and sanity: 'To be disorientated in space is to be psychotic.'

Hall describes this conception as fixed feature space. There is no denying the effect this has upon the psychology of the child, indeed on our society as a whole. Winston
Figure 1.3a and b
First floor plan of Hatfield House, Herts, 1607–11, taken from A History of Architecture by Banister Fletcher (Figure 1.3a). Compare this with the plan of a typical Robson School, 1911. (School Architecture, E.R. Robson.)

Figure 1.3c
Bonner Street Primary School, Hackney, London, designed by Robson in 1875. An early example which is still in use today. Although added to and extended on a number of occasions in the years after it opened, the building adapted well to curriculum needs, providing a robust workable environment. Despite the contextual additions, the most significant losses are the tall chimney stacks and bell tower which gave the original composition a romantic castelated quality.

Figure 1.3d
Detail of the giant gable ends protruding up towards the pitched roof.
Both settings show the school master and mistresses positioned to control and supervise; however, the Whiteley Woods image suggests a more spacious approach to the environment. (The English School, 1870–1970, Seaborne and Lowe.)

Plan of school playground suggested by the Home and Colonial Society. Each of five types of apparatus (four shown), are prescribed for different aged children in this highly ordered layout.