PHILOSOPHY OF SCIENCE
An Overview for Cognitive Science
Tutorial Essays in Cognitive Science

Advisory Editor
Donald A. Norma
Andrew Orton

**BECHETEL:** Philosophy of Science: An Overview for Cognitive Science

**BECHETEL:** Philosophy of Mind: An Overview for Cognitive Science

**GREEN:** Linguistic Pragmatics for Cognitive Science
This volume is dedicated to the memory of

HANNA

who helped in ways she could not understand
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Contents

PREFACE xi

1 THE LOCUS OF PHILOSOPHY OF SCIENCE 1

Introduction: What is Philosophy of Science? 1
Areas of Philosophy that Bear on Philosophy of Science 3
Conclusion 15

2 LOGICAL POSITIVISM: THE RECEIVED VIEW IN PHILOSOPHY OF SCIENCE 17

Introduction: The Origins of Logical Positivism 17
The Verifiability Theory of Meaning 19
The Deductive–Nomological Model of Explanation and the Hypothetico–Deductive Model of Theory Development 22
The Axiomatic Account of Theories 27
Summary of Logical Positivism 29
CHALLENGES TO LOGICAL POSITIVISM 32

Introduction: Challenges to Specific Theses of Logical Positivism 32
The Attack on Confirmation 32
Repudiation of the Deductive–Nomological Model of Explanation 38
Critique of the Analytic–Synthetic Distinction 41
A Challenge to the Observation–Theory Distinction 44
Overview of the Criticisms of Positivism 48

POST-POSITIVIST PHILOSOPHY OF SCIENCE 50

The Emergence of Historically Grounded Philosophy of Science 50
Kuhn’s Challenge: Normal and Revolutionary Science 52
Feyerabend’s Attack on Method 58
Lakatosian Research Programmes 60
Laudan’s Research Traditions 63
Studies of Scientific Discovery 65
Summary of Post-Positivist Philosophy of Science 68

THEORY REDUCTION AS A MODEL FOR RELATING DISCIPLINES 71

Introduction: Relating Disciplines by Relating Theories 71
The Theory Reduction Model and the Unity of Science Program 72
Arguments Against Trying to Reduce Psychology to Neuroscience 76
Reduction as Facilitating the Co-Evolution of Psychology and Neuroscience 82
The Elimination of Folk Psychology in Favor of One that is Reducible 87
Implications of the Theory Reduction Model for Relating Psychology and Neuroscience 92

6 AN ALTERNATIVE MODEL FOR INTEGRATING DISCIPLINES 94
Introduction: The Desire for an Alternative Model 94
Shortcomings of the Theory Reduction Model 94
Darden and Maull's Conception of Interfield Theories 97
Interfield Theories Between Cognitive Science and Neuroscience 101
Interfield Theories Within Cognitive Science 110
Conclusions Concerning Cross-Disciplinary Research 117

POSTSCRIPT 119
REFERENCES 120
AUTHOR INDEX 130
SUBJECT INDEX 134
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As one of the several contributing disciplines to cognitive science, philosophy offers two sorts of contributions. On the one hand, *philosophy of science* provides a metatheoretical perspective on the endeavors of any scientific enterprise, analyzing such things as the goals of scientific investigation and the strategies employed in reaching those goals. Philosophy of science thus offers a perspective from which we can examine and potentially evaluate the endeavors of cognitive science. On the other hand, *philosophy of mind* offers substantive theses about the nature of mind and of mental activity. Although these theses typically have not resulted from empirical investigation, they often have subsequently figured in actual empirical investigations in cognitive science, or its predecessors. Because the two roles philosophy plays in cognitive science are quite different, they are introduced in separate volumes. This one focuses on philosophy of science, whereas issues in philosophy of mind are explored in *Philosophy of Mind: An Overview for Cognitive Science*.

The strategy for this volume is to present a variety of views from philosophy of science that have figured in discussions about cognitive science. Some of these views are no longer widely accepted by philosophers of science. Nonetheless, they have been and, in some cases, remain influential outside of philosophy. Moreover, some older views have provided the starting point for current philosophical thinking that is done against a backdrop of previous endeavors, with a recognition of both their success and failure.

After an introductory chapter that introduces some of the other domains of philosophy that are pertinent to philosophy of science, this book falls into two main parts. Chapters 2, 3, and 4 explore general views about the nature of science and scientific explanation. Chapter 2 focuses on Logical Positivism,
a comprehensive view of the character of scientific theories and their status as claims to knowledge that was developed in the first half of this century. As I discuss in chapter 3, many of the doctrines of Logical Positivism have been criticized and the position is no longer widely accepted. But it continues to have wide influence in science. Its influence is particularly noticeable in the standard accounts of scientific method presented in the early chapters of introductory science texts. One reason Logical Positivism remains influential is that there has been no successor perspective that has gained comparable acceptance. A new perspective, however, is arising amongst those philosophers who have taken seriously the importance of actual scientific practice, particularly as revealed through the history of science. This new approach, which began with Thomas Kuhn's *The Structure of Scientific Revolutions*, (1962/1970), is discussed in chapter 4.

Chapters 5 and 6 explore an issue in philosophy of science that is particularly pertinent to practitioners of cognitive science. This is the question of the proper way of relating inquiries in different disciplines of science. A legacy of Logical Positivism, the Theory Reduction Model offers one widely discussed model for relating disciplines. It focuses on the relationship between the cognitive sciences and neuroscience and advocates the view that cognitive science theories should be reducible to neuroscience theories. This model, which has recently been defended in the influential text of Patricia Churchland, *Neurophilosophy* (1986), is discussed in chapter 5. A number of philosophers, however, have come to reject the Theory Reduction Model and have sought alternative views of the relationships between disciplines. One of these is discussed in chapter 6. It provides not only a different perspective on the relationship of cognitive science to neuroscience but also on the interactions of disciplines within cognitive science itself.

For those not previously acquainted with philosophy, some comments about how to approach philosophical material are in order. Although it used to be widely proclaimed that philosophical claims do not require empirical evidence, this view is much less accepted today. It remains the case, however, that philosophical claims tend to be fairly far removed from empirical evidence. Therefore, there tends to be much greater room for argument as to the virtues of particular claims than in many cases where empirical evidence is readily at hand. In considering the views discussed in this book, the reader should bear in mind the controversial and argumentative character of philosophical inquiry. This means that rather than simply accepting or rejecting a view, the reader should consider the possible kinds of arguments that might be made on behalf of or against the views presented. The reader, thereby, enters into the argument itself, and does not remain a passive observer. Although the accumulated efforts of philosophers provide a resource for anyone taking up these issues, the issues are not the exclusive prerogative of philosophers; scientists are encouraged to engage with the issues themselves and to reach their own conclusions.
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