

# Contents

Introduction . . . . .	9
<b>1 The Semantics of Kant's Transcendental Analytic and its implications for Natural Philosophy</b>	<b>17</b>
1.1 The Kantian Tables . . . . .	17
1.2 Transcendental and Metaphysical Principles . . . . .	26
1.3 The Structure of <i>Metaphysische Anfangsgründe der Naturwissenschaften</i>	34
<b>2 The Helmholtzian Tradition of Theoretical Physics; Helmholtz and Planck</b>	<b>51</b>
2.1 The Principles of Classical Mechanics . . . . .	51
2.2 The Principle of Least Action and The Quantum Theory . . . . .	58
2.3 Hermann von Helmholtz's Philosophy of Physics . . . . .	66
2.4 Max Planck and the Philosophy of Unity . . . . .	81
<b>3 Assessing the Early Quantum Mechanics: Heisenberg and Bohr</b>	<b>95</b>
3.1 Werner Heisenberg's original understanding of the Principles of The Quantum Theory . . . . .	95
3.2 Heisenberg's <i>The Physical Principles of The Quantum Theory</i> . . . . .	99
3.3 Niels Bohr's original understanding of the Principles of The Quantum Theory . . . . .	113
<b>4 The Principles of the Quantum Theory: Einstein and Bohr</b>	<b>140</b>
4.1 Einstein's critique of Quantum Physics . . . . .	140
4.2 The Interaction Problem in The Quantum Theory . . . . .	154
4.3 The Observation Problem in The Quantum Theory . . . . .	164
4.4 Causality and Complementarity . . . . .	169
4.5 Apparata as Schemata; a Discussion of Rom Harré . . . . .	179
<b>5 Classical Physics as Ideal. A critical assessment of some recent interpretations of Bohr's philosophy of physics</b>	<b>209</b>
5.1 The two Dogmas of the Copenhagen Interpretation of Quantum Physics	209
5.2 John Honner's interpretation of Bohr . . . . .	212
5.3 Henry J. Folsø on Bohr and how Science informs Epistemology . . . . .	218
5.4 Jan Faye's interpretation of Bohr as a Semantic Conceptualist . . . . .	230
<b>6 Unity – of Nature, Knowledge, Practice, and Language</b>	<b>256</b>
6.1 The general Framework of Complementarity . . . . .	256
6.2 The Unity of Semantics and Pragmatics within the Framework of Complementarity – concluding considerations . . . . .	277
Summary . . . . .	289
Literature . . . . .	295