CONTENTS

୬୧

Preface to the English Edition	xi
Foreword	1
PART 1: PHYSICAL FACTS AND RELATED	
CONCEPTUAL PROBLEMS	
CHAPTER 1	
Broad Overview	13
1-1. A General Picture	13
1-2. Some Useful Definitions	21
CHAPTER 2	
Overstepping the Limits of the Framework of Familiar Concepts	32
2-1. Introduction	32
2-2. From Aristotle's Ontology to Descartes' Near	
Realism and Galilean Ontology	32
2-3. A Small Digression on Ontology	34
2-4. A Gradual Overstepping	37
2-5. Trajectories and Misleading "Pieces of Evidence"	38
2-6. On the Existence or Nonexistence of Hidden Things: Particles and Dirac's Sea	41
2-7. A "Fabricated" Ontology	46
2-7. A Tubhcaled Onlongy 2-8. Indications for What Follows	48
CHAPTER 3 Nonseparability and Bell's Theorem	51
3-1. Correlation at-a-Distance: Bell's Theorem	51
3-1. Correlation at-a-Distance. Bet 's Theorem 3-2. Locality and the Bell Theorem	58
3-3. Discussion and Philosophical Implications	71
CHARTER 4	
CHAPTER 4 Objectivity and Empirical Reality	89
4-1. Strong Objectivity and Weak Objectivity	
(Alias Intersubjectivity)	89

4-2. The Measurement Problem and Empirical Reality	101
4-3. "Quantum Rules" and "von Neumann's Chain"	110
CHAPTER 5	
Quantum Physics and Realism	113
5-1. Strong Objectivity and Realism	113
5-2. Intersubjective Agreement	127
5-3. Intersubjective Agreement and Empirical Reality	127
5-4. Conceptual Glimpses; Carnap, Quine, Primas;	
Relative Ontologies	129
CHAPTER 6	
Universal Laws and the "Reality" Question	134
6-1. The "Theoretical Framework" Notion	134
6-2. Antiuniversalism and "Realism about Entities"	136
6-3. "Pythagorism" ("Einsteinism")	142
6-4. Remarks Concerning Two "Macrorealisms"	145
6-5. Quantum Mechanics as a Universal Theoretical Framework	146
6-6. Antirealism	148
CHAPTER 7	
Antirealism and Physics; the Einstein-Podolsky-Rosen	
Problem; Methodological Operationalism	152
7-1. "Value of a Quantum Physical Quantity" in the	
Antirealist Framework	152
7-2. Operationalism (Alias "Instrumentalism")	156
7-3. On "Meaning" and "Prediction"	166
CHAPTER 8	
Measurement and Decoherence, Universality Revisited	168
8-1. Introduction	168
8-2. Decoherence	177
8-3. Decoherence and State Robustness	189
8-4. The Everett-Zurek Semirealist Approach	190
8-5. Universality Revisited	192
CHAPTER 9	
Various Realist Attempts	196
9-1. Introduction	196
9-2. On Our Intellectual Craving for Realism	196
9-3. The Broglie-Bohm Approach	199
9-4. The So-Called "Modal" Interpretation	206

CONTENTS vii

9-5. The Heisenberg Representation: It Does Not,	
by Itself, Yield a Solution	209
9-6. Feynman's Reformulation and the Corresponding	
"Fabricated Ontology"	211
9-7. A "Realism of Signification"	216
9-8. Nonlinear Realist Quantum Theories	220
9-9. Outlook	222
CHAPTER 10	
Schrödinger's Cat, Wigner's Friend, and Veiled Reality	225
10-1. Introduction	225
10-2. Of Pointers and Cats	225
10-3. Wigner's Friend	228

10-5.	wigner's Triena -	220
10-4.	. The Veiled Reality Hypothesis 2	236

PART 2: A PHILOSOPHICAL ANALYSIS

CHA	PTER	11

Science and Philosophy	249
11-1. The Impossible Split	249
11-2. Epistemology in the Late Twentieth Century	250
11-3. A Critical Glance at Some Claims	255
11-4. Physics and Linguistics	258
11-5. Sociologism	261
11-6. The End of Certainties?	263

CHAPTER 12

Materialisms	265
12-1. Introduction	265
12-2. Dialectical Materialism	265
12-3. The So-Called "Scientific" Materialism	266
12-4. "Neomaterialism" and Physics	272
12-5. The Purely Philosophical Aspects of Neomaterialism	276
12-6. Materialism and Wisdom	281

CHAPTER 13

cinii fex to	
Suggestions from Kantism	282
13-1. Introduction	282
13-2. A Look at Kantism	282
13-3. Facing the Refusal of the Independent Reality Notion	291
13-4. Kant and Our Contemporaries	306

CHAPTER 14	
Causality and Observational Predictability	312
14-1. Introduction	312
14-2. Causes and Laws	312
14-3. Determinism and Causality	315
14-4. Determinism and Chaos	316
14-5. Quantum Indeterminacy	319
14-6. Predictability and Reliability Revisited	326
14-7. The Influence Notion Revisited	330
CHAPTER 15	
Explanation and Phenomena	333
15-1. Introduction	333
15-2. The Notion of Explanation	333
15-3. Back to the "Explanatory Power of Predictive	
Rules" Question	342
15-4. Empirical Reality and Abstractions, Explanation,	
and Empirical Causality	344
15-5. The Rainbow Analogy	347
15-6. Removing the "Paradox of the Dinosaurs"	351
15-7. The "False Explanation" Question	352
CHAPTER 16	
Mind and Things	354
Mind and Things 16-1. Empiricism, Positivism, and So On	354
Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism	354 355
Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism 16-3. Ambiguities about Innatism	354 355 366
Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism	354 355
Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism 16-3. Ambiguities about Innatism 16-4. Poincaré, Conventionalism, and Structural Realism CHAPTER 17	354 355 366 368
Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism 16-3. Ambiguities about Innatism 16-4. Poincaré, Conventionalism, and Structural Realism	354 355 366 368 376
Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism 16-3. Ambiguities about Innatism 16-4. Poincaré, Conventionalism, and Structural Realism CHAPTER 17 Pragmatic-Transcendental versus Veiled Reality Approaches 17-1. Introduction	354 355 366 368 376 376
Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism 16-3. Ambiguities about Innatism 16-4. Poincaré, Conventionalism, and Structural Realism CHAPTER 17 Pragmatic-Transcendental versus Veiled Reality Approaches 17-1. Introduction 17-2. Replies to Michel Bitbol's and Hervé Zwirn's Objections	354 355 366 368 376 376 376
 Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism 16-3. Ambiguities about Innatism 16-4. Poincaré, Conventionalism, and Structural Realism CHAPTER 17 Pragmatic-Transcendental versus Veiled Reality Approaches 17-1. Introduction 17-2. Replies to Michel Bitbol's and Hervé Zwirn's Objections 17-3. The Pragmatic-Transcendental Approach 	354 355 366 368 376 376 376 396
Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism 16-3. Ambiguities about Innatism 16-4. Poincaré, Conventionalism, and Structural Realism CHAPTER 17 Pragmatic-Transcendental versus Veiled Reality Approaches 17-1. Introduction 17-2. Replies to Michel Bitbol's and Hervé Zwirn's Objections	354 355 366 368 376 376 376
 Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism 16-3. Ambiguities about Innatism 16-4. Poincaré, Conventionalism, and Structural Realism CHAPTER 17 Pragmatic-Transcendental versus Veiled Reality Approaches 17-1. Introduction 17-2. Replies to Michel Bitbol's and Hervé Zwirn's Objections 17-3. The Pragmatic-Transcendental Approach 17-4. A Few Notes on Zwirn's Approach 	354 355 366 368 376 376 376 396 402
 Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism 16-3. Ambiguities about Innatism 16-4. Poincaré, Conventionalism, and Structural Realism CHAPTER 17 Pragmatic-Transcendental versus Veiled Reality Approaches 17-1. Introduction 17-2. Replies to Michel Bitbol's and Hervé Zwirn's Objections 17-3. The Pragmatic-Transcendental Approach 17-4. A Few Notes on Zwirn's Approach CHAPTER 18 Objects and Consciousness	354 355 366 368 376 376 376 376 396 402 405
 Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism 16-3. Ambiguities about Innatism 16-4. Poincaré, Conventionalism, and Structural Realism CHAPTER 17 Pragmatic-Transcendental versus Veiled Reality Approaches 17-1. Introduction 17-2. Replies to Michel Bitbol's and Hervé Zwirn's Objections 17-3. The Pragmatic-Transcendental Approach 17-4. A Few Notes on Zwirn's Approach CHAPTER 18 Objects and Consciousness 18-1. Introduction 	354 355 366 368 376 376 376 376 396 402 405
 Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism 16-3. Ambiguities about Innatism 16-4. Poincaré, Conventionalism, and Structural Realism CHAPTER 17 Pragmatic-Transcendental versus Veiled Reality Approaches 17-1. Introduction 17-2. Replies to Michel Bitbol's and Hervé Zwirn's Objections 17-3. The Pragmatic-Transcendental Approach 17-4. A Few Notes on Zwirn's Approach CHAPTER 18 Objects and Consciousness 18-1. Introduction 18-2. Truth: Definitions and Criteria 	354 355 366 368 376 376 376 376 396 402 405 405
 Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism 16-3. Ambiguities about Innatism 16-4. Poincaré, Conventionalism, and Structural Realism CHAPTER 17 Pragmatic-Transcendental versus Veiled Reality Approaches 17-1. Introduction 17-2. Replies to Michel Bitbol's and Hervé Zwirn's Objections 17-3. The Pragmatic-Transcendental Approach 17-4. A Few Notes on Zwirn's Approach CHAPTER 18 Objects and Consciousness 18-1. Introduction 18-2. Truth: Definitions and Criteria 18-3. Objects and "Orders," or "Levels," of Reality 	354 355 366 368 376 376 376 376 396 402 405 405 406 408
 Mind and Things 16-1. Empiricism, Positivism, and So On 16-2. Phenomenalism 16-3. Ambiguities about Innatism 16-4. Poincaré, Conventionalism, and Structural Realism CHAPTER 17 Pragmatic-Transcendental versus Veiled Reality Approaches 17-1. Introduction 17-2. Replies to Michel Bitbol's and Hervé Zwirn's Objections 17-3. The Pragmatic-Transcendental Approach 17-4. A Few Notes on Zwirn's Approach CHAPTER 18 Objects and Consciousness 18-1. Introduction 18-2. Truth: Definitions and Criteria 	354 355 366 368 376 376 376 376 396 402 405 405

CONTENTS ix

CHAPTER 19	
The "Ground of Things"	429
19-1. Introduction	429
19-2. Mystery, Affectivity, and Meaning	429
19-3. Do Things Have a "Ground"? Pro and Con	
Received Arguments	434
19-4. Some Consequences of the Evolution of Physics	443
19-5. The Veiled Reality Conception Reexamined	449
APPENDIX 1	
The Bell Theorem	465
A. Proof	465
B. A Simplified Proof	470
C. A Glance at the Experimental State of Things	473
D. Historical Comments and a Short Bibliography	474
APPENDIX 2	
Consistent Histories, Counterfactuality, and Bell's Theorem	477
APPENDIX 3	10.0
Correlation-at-a-Distance in the Broglie-Bohm Model	483
References	485
Name Index	493
Subject Index	497