Contents

	PREFACE	ix
	ACKNOWLEDGMENTS	xiii
1.	Scientific Explanation: Three General Conceptions	3
	Explanation versus Description	4
	Other Types of Explanation	9
	Laplacian Explanation	11
	Three Basic Conceptions	15
	An Outline of Strategy	21
2.	Statistical Explanation and Its Models	24
	Inductive-Statistical Explanation	27
	The Statistical-Relevance Approach	36
3.	Objective Homogeneity	48
	Epistemic Relativization	48
	Randomness	55
	Homogeneity	60
	Some Philosophical Applications	72
	Some Philosophical Reflections	76
4.	The Three Conceptions Revisited	84
	The Epistemic Conception	84
	The Modal Conception	111
	The Ontic Conception	121
	How These Conceptions Answer a Fundamental Question	124
	Conclusions	133
5.	Causal Connections	135
	Basic Problems	135
	Two Basic Concepts	137
	Processes	139
	The 'At-At' Theory of Causal Propagation	147

viii | Contents

Causal Forks and Common Causes	158
Conjunctive Forks	158
Interactive Forks	168
Relations between Conjunctive and Interactive Forks	174
Perfect Forks	177
The Causal Structure of the World	178
Concluding Remarks	182
Probabilistic Causality	184
The Sufficiency/Necessity View	185
· · · · · · · · · · · · · · · · · · ·	190
	192
Causal Processes and Propensities	202
Theoretical Explanation	206
Causal Connections and Common Causes	207
	211
• •	213
	227
Empiricism and Realism	229
The Mechanical Philosophy	239
Logic versus Mechanisms	239
	242
	259
	267
The Final Contrast	276
BIBLIOGRAPHY	280
INDEX	295
	Conjunctive Forks Interactive Forks Relations between Conjunctive and Interactive Forks Perfect Forks The Causal Structure of the World Concluding Remarks Probabilistic Causality The Sufficiency/Necessity View Statistical Relevance and Probabilistic Causality Causality and Positive Relevance Causal Processes and Propensities Theoretical Explanation Causal Connections and Common Causes Explanatory versus Inferential Principles The Common Cause Principle and Molecular Reality The Explanatory Power of Theories Empiricism and Realism The Mechanical Philosophy Logic versus Mechanisms Explanation in Quantum Mechanics Explanation and Understanding The Causal/Mechanical Model The Final Contrast BIBLIOGRAPHY