Contents

PREFACE XI

Introduction 3

Part I: Emergence

1 Part and Whole, Resultant and Emergent 9

- 1 Association and Combination 10
- 2 Emergence and Supervenience 12
- 3 Levels and Evolution 15
- 4 Structure and Mechanism 19
- 5 Emergence and Explanation 21
- Concluding Remarks 24

2 System Emergence and Submergence 26

- 1 System Emergence 27
- 2 Emergence ex nihilo? 30
- 3 Submergence: System Dismantling 31
- 4 System Types 33
- 5 The CESM Model 34
- Concluding Remarks 38

3 The Systemic Approach 40

- 1 The Systemic Approach 40
- 2 Conceptual and Material Systems 42
- 3 The Systemic Approach to Physical and Chemical Processes 43

- vi Contents
 - 4 The Systemic Approach to Life 45

5 The Systemic Approach to Brain and Mind 49 Concluding Remarks 52

4 Semiotic and Communication Systems 53

- 1 Words, Ideas, and Things 54
- 2 Semiotic System 58
- 3 Languages as Semiotic Systems 60
- 4 Speech and Language 62
- 5 Speech Learning and Teaching 65
- 6 Communication System 67

Concluding Remarks 68

5 Society and Artefact 70

- 1 The Systemic Approach to Society 71
- 2 Microsocial and Macrosocial, Sectoral and Integral 73
- 3 Emergence by Design 75
- 4 Social Invention 76
- 5 Philosophical Dividends of the Systemic Approach 77 Concluding Remarks 80

6 Individualism and Holism: Theoretical 82

1 Individual and Individualism, Whole and Holism 84

- 2 Ontological 85
- 3 Logical 87
- 4 Semantic 89
- 5 Epistemological 91
- 6 Methodological 93

Concluding Remarks 95

7 Individualism and Holism: Practical 97

- 1 Value Theory, Action Theory, and Ethics 97
- 2 Historical and Political Individualism 100
- 3 First Alternative to Individualism: Holism 101
- 4 Hybrids 105
- 5 The Systemic Alternative 106
- Concluding Remarks 109

8 Three Views of Society 112

- 1 The Two Classical Views of Society 112
- 2 The Systemic Approach 114

3 From Statistics to Theoretical Models 115

- 4 The Science-Technology-Market Supersystem 119
- 5 Implications for Social-policy Design 121
- 6 Social Studies Are about Social Systems 122
- 7 The Competitive Advantage of Systemism 124

Concluding Remarks 126

Part II: Convergence

9 Reduction and Reductionism 129

- 1 Reduction Operations 130
- 2 Micro-levels, Macro-levels, and Their Relations 133
- 3 Same-level and Inter-level Relations 135
- 4 Inter-level Hypotheses and Explanations 136
- 5 From Physics to Chemistry 137
- 6 Biology, Ecology, and Psychology 139
- 7 From Biology to Social Science: Human Sociobiology and the IQ Debate 141
- 8 Kinds and Limits of Reduction 144
- 9 Reduction and Materialism 146
- 10 Concluding Remarks 147

10 A Pack of Failed Reductionist Projects 149

- 1 Physicalism 149
- 2 Computationism 150
- 3 Linguistic Imperialism 152
- 4 Biologism I: Sociobiology 154
- 5 Biologism II: Evolutionary Psychology 156
- 6 Psychologism 162
- 7 Sociologism, Economism, Politicism, and Culturalism 164

Concluding Remarks 167

11 Why Integration Succeeds in Social Studies 168

- 1 The B-E-P-C Square 169
- 2 Social Multidisciplinarity 171
- 3 Social Interdisciplinarity 176

Concluding Remarks 177

12 Functional Convergence: The Case of Mental Functions 179

1 Informationist Psychology 181

- viii Contents
 - 2 Mark II Model: Connectionism 183
 - 3 Localization of Mental Functions 185
 - 4 Functional Interdependence of Neural Modules 187
 - 5 Consciousness: From Mystery to Scientific Problem 188
 - 6 Two Convergence Processes 191

Concluding Remarks 194

13 Stealthy Convergence: Rational-choice Theory and Hermeneutics 196

- 1 Divergence and Convergence 197
- 2 Methodological Individualism 199
- 3 Subjective Process and Observable Behaviour 201
- 4 Inverse Problems 203
- 5 Figuring Out Mediating Mechanisms 206
- 6 Example: The Delinquency–Unemployment Relation 208 Concluding Remarks 209

14 Convergence as Confusion: The Case of 'Maybe' 213

- 1 Logical Possibility 214
- 2 Factual Possibility 217
- 3 Likelihood 220
- 4 Relation between Frequency and Probability 221
- 5 Probability, Chance, and Causation 223
- 6 Credibility 226
- 7 Probabilistic Epistemology 228
- 8 Plausibility or Verisimilitude 232
- 9 Towards a Plausibility Calculus 233

Concluding Remarks 235

15 Emergence of Truth and Convergence to Truth 237

- 1 The Nature of Truth 237
- 2 Towards an Exact Concept of Correspondence 239
- 3 Partial Truth 241
- 4 The Emergence of the Knowledge of Truth 245
- 5 Truth-centred Ethics and Ideology 247
- Concluding Remarks 249

16 Emergence of Disease and Convergence of the Biomedical Sciences 250

1 Multilevel Systems and Multidisciplinarity 250

- 2 What Kind of Entity Is Disease? 252
- 3 Diagnosis as an Inverse Problem 253
- 4 Knowledge of Mechanism Strengthens Inference 256
- 5 Bayesian Number Juggling 259
- 6 Decision-theoretic Management of Therapy 261
- 7 Medicine between Basic Science and Technology 263 Concluding Remarks 265

17 The Emergence of Convergence and Divergence 268

- 1 Divergence 268
- 2 Convergence 270
- 3 Caution against Premature Unification 272
- 4 Why Both Processes Are Required 274
- 5 Logic and Semantics of Integration 277
- 6 Glue 278
- 7 Integrated Sciences and Technologies 280
- Concluding Remarks 282

GLOSSARY 285 REFERENCES 293 INDEX OF NAMES 315 INDEX OF SUBJECTS 323