

Contents

Part I Overview and Historiography

1	Introduction	3
1.1	Agency as a Subject of Science	4
1.2	Agency and Physics	8
1.3	Mechanistic and Non-mechanistic Approaches to Agency	10
1.4	Integrating Mechanism and Semiosis	15
1.5	Outline of Book Chapters	16
	References	19
2	Historical Overview of Developments of Notions of Agency	23
2.1	Agency in Ancient Philosophy: Aristotle	23
2.2	Mind-Body Dualism: Descartes	26
2.3	<i>A Priori</i> Knowledge: Kant	27
2.4	Evolutionism: Lamarck, Darwin and Spencer	28
2.5	Non-mechanistic Approaches: James and Bergson	33
2.6	Semiotic Agency	36
2.7	Classical Phenomenology: Husserl, Heidegger, and Merleau-Ponty	38
2.8	Hermeneutics: Dilthey, Heidegger, and Gadamer	40
2.9	Anthropocentric Existentialism on Agency: Sartre and Marcel	42
2.10	Cybernetic Agency	45
2.11	The Rise of Biosemiotics	48
	References	52

Part II Agency in Organisms and Beyond

3	Human Agency	59
3.1	A Family of Subagents	59
3.2	Bodily Agency	60
3.3	Cognitive Subagents	62
3.4	The Human Niche	64

3.5	Development of Human Agency Through the Lifetime	65
3.5.1	Embryo and Fetus	66
3.5.2	Infant and Toddler	67
3.5.3	Young Child and Teenager	71
3.5.4	Adult	73
3.5.5	Elderly	74
3.5.6	Marginal Cases	75
3.6	Development of Human Agency in Historical Perspective	77
3.7	Human Culture and Language	83
3.8	Social Regulation: Ethics, Economy, and Law	85
	References	90
4	Agency in Non-human Organisms	95
4.1	Gradation of Competence in Semiotic Agency	95
4.2	The Agency of Bacteria	100
4.3	The Eukaryotic Transition	103
4.4	The Multicellular Transition	104
4.5	Neural Takeover	107
4.6	Learning in Animals	111
4.7	Consciousness and Cognition in Animals	117
	References	119
5	Origins of Life	123
5.1	Most Popular Scenarios: RNA World and Autocatalytic Sets	124
5.2	Primordial Soup and Chemical Evolution	126
5.3	Agential Approach to the Origin of Life	127
5.4	Lipid World and Heritability in Molecular Assemblies	130
5.5	Coenzyme World	131
5.6	Diversification of Molecular Communities	134
5.7	Evolutionary Potential	136
5.8	Emergence of Template-Based Replication	137
5.9	Transition from Surface Metabolism to Membrane-Bound Cells	139
5.10	From the RNA World to Prokaryote Cells	140
5.11	The Age of Life	141
	References	144

Part III Theoretical Considerations

6	Conceptualizing Agency	153
6.1	Agency and Its Ontological Status	153
6.2	Autonomy	158
6.2.1	Autopoiesis	158
6.2.2	Self-Governing	160
6.2.3	Semiotic Freedom	163

6.3	Goal-Directedness	166
6.4	Individuation	169
6.5	Agents from Agents	172
6.6	Types of Agents	176
6.7	Agents and Mechanisms	182
	References	184
7	Semiosis	189
7.1	Types of Signs and Semiosis	189
7.2	Signs as Semiotic Instruments	194
7.3	Signs Are Agent-Specific	195
7.4	Sign Processes and Sign Relations	197
7.5	Sign and Agency	206
7.6	Sign and Information	208
7.7	Protosemiosis: No Perception of Objects	211
7.8	Eusemiosis: The Emergence of a Minimal Mind	215
	References	219
8	Semiogenesis	225
8.1	Defining Semiogenesis	225
8.2	Semiogenesis in Evolution	227
8.2.1	Adaptation Is a Biosemiotic Phenomenon	227
8.2.2	Emergence of Novel Adaptations	229
8.2.3	Natural Selection	237
8.2.4	Systemic Patterns of Variation in Evolution	241
8.3	Adaptation in Development	243
8.4	Physiological and Behavioral Adaptations	245
8.4.1	Physiological and Behavioral Plasticity	245
8.4.2	Learning and Cognition	246
8.4.3	Advanced Cognitive Functions	249
8.4.4	Intentionality	252
8.5	Growth in Semiotic Complexity	253
	References	258
9	Phenomenology	263
9.1	What Is Phenomenology? And What Could It Be?	263
9.2	Semiotics and Phenomenology	268
9.3	Naturalized Phenomenology	271
9.4	Subjectivity	275
9.5	Sentience	278
9.6	Consciousness	280
9.7	Self-Consciousness	282
	References	284

Part IV Agency and Complexity

10 Composite Agency	291
10.1 The Composite Nature of Agents.....	291
10.2 Interaction of Subagents	294
10.3 Benefits of Modularity	295
10.4 Semiogenesis in Composite Agents.....	298
10.4.1 Guiding Semiogenesis	298
10.4.2 The Emergence of Composite Agents	302
10.5 Mixed Identity	307
References.....	310
11 Human Agency and Ecology	313
11.1 The World-Changing Effects of Human Agency: The Emergence of the Anthropocene.....	313
11.2 Human Agency as a Driver of Environmental Change	317
11.3 Human-Animal Complexes (Domestication).....	320
11.4 The Ecological Function of Human-Animal Assemblages	321
11.5 Sustainability: How to Address Environmental Problems.....	323
11.6 Animal Welfare: Facilitating Autonomy and Needs-Fulfilment in Animal Husbandry	325
11.7 Wildlife Management: Facilitating Autonomy in Wild Animals and Other Wildlife.....	327
References.....	329
12 Agentology: Crosspollination of Science and Philosophy	333
12.1 Emergence of Agentology	333
12.2 Biosemiotics – An Integrating Platform for Agential Studies	335
12.2.1 Connections with Information Theory.....	336
12.2.2 Connections with Constructivism and Evolutionary Epistemology	338
12.2.3 Connections with Enactivism	339
12.2.4 Connections with Phenomenology	341
12.3 Major Conclusions of the Book.....	343
References.....	346
Glossary	349
Index.....	361