

Contents

0. Preface	1
1. Two philosophies of nature	
1.1 What is the philosophy of nature?	3
1.2 Aristotelian philosophy of nature in outline	12
1.2.1 Actuality and potentiality	13
1.2.2 Hylemorphism	20
1.2.3 Limitation and change	27
1.2.4 Efficient and final causality	32
1.2.5 Living substances	39
1.3 The mechanical world picture	42
1.3.1 Key elements of the mechanical philosophy	43
1.3.2 Main arguments for the mechanical philosophy	52
2. The scientist and scientific method	
2.1 The arch of knowledge and its “empiriometric” core	65
2.2. The intelligibility of nature	75
2.3 Subjects of experience	85
2.4 Being in the world	95
2.4.1 Embodied cognition	97
2.4.2 Embodied perception	106
2.4.3 The scientist as social animal	114
2.5 Intentionality	116
2.6 Connections to the world	124
2.7 Aristotelianism begins at home	132
3. Science and Reality	
3.1 Verificationism and falsificationism	139
3.2 Epistemic structural realism	151
3.2.1 Scientific realism	151
3.2.2 Structure	158
3.2.3 Epistemic not ontic	171
3.3 How the laws of nature lie (or at least engage in mental reservation)	177
3.4 The hollow universe	191

4. Space, Time, and Motion	
4.1 Space	195
4.1.1 Does physics capture all there is to space?	195
4.1.2 Abstract not absolute	198
4.1.3 The continuum	204
4.2 Motion	208
4.2.1 How many kinds of motion are there?	208
4.2.2 Absolute and relative motion	212
4.2.3 Inertia	216
4.2.3.1 Aristotle versus Newton?	216
4.2.3.2 Why the conflict is illusory	216
4.2.3.3 Is inertia real?	225
4.2.3.4 Change and inertia	229
4.3 Time	233
4.3.1 What is time?	233
4.3.2 The ineliminability of tense	239
4.3.2.1 Time and language	239
4.3.2.2 Time and experience	243
4.3.3 Aristotle versus Einstein?	256
4.3.3.1 Making a metaphysics of method	256
4.3.3.2 Relativity and the A-theory	264
4.3.4 Against the spatialization of time	274
4.3.5 The metaphysical impossibility of time travel	282
4.3.6 In defense of presentism	269
4.3.7 Physics and the funhouse mirror of nature	303
5. The philosophy of matter	
5.1 Does physics capture all there is to matter?	307
5.2 Aristotle and quantum mechanics	310
5.2.1 Quantum hylemorphism	312
5.2.2 Quantum mechanics and causality	324
5.3 Chemistry and reductionism	330
5.4 Primary and secondary qualities	340
5.5 Is computation intrinsic to physics?	351
5.5.1 The computational paradigm	352
5.5.2 Searle's critique	359
5.5.3 Aristotle and computationalism	366
6. Animate nature	
6.1 Against biological reductionism	375
6.1.1 What is life?	375

6.1.2 Genetic reductionism	384
6.1.3 Function and teleology	387
6.1.4 The hierarchy of life forms	391
6.2 Aristotle and evolution	400
6.2.1 Species essentialism	400
6.2.2 Natural selection is teleological	406
6.2.3 Transformism	420
6.2.4 Problems with some versions of “Intelligent Design” theory	432
6.3 Against neurobabble	442
<i>Bibliography</i>	457
<i>Index</i>	499