Contents

	Series Foreword Gerd B. Müller, Thomas Pradeu, and Katrin Schäfer	ix
	Preface Daniel S. Brooks, James DiFrisco, and William C. Wimsatt	xi
	Introduction: Levels of Organization: The Architecture of the Scientific Image Daniel S. Brooks, James DiFrisco, and William C. Wimsatt	1
1	Levels, Robustness, Emergence, and Heterogeneous Dynamics:	
	Finding Partial Organization in Causal Thickets William C. Wimsatt	21
2	Levels of Organization as Tool and Doctrine in Biology Daniel S. Brooks	39
3	Our World Isn't Organized into Levels Angela Potochnik	61
4	Levels, Nests, and Branches: Compositional Organization and Downward Causation in Biology Markus I. Eronen	77
5	Levels, Perspectives, and Thickets: Toward an Ontology of Complex Scaffolded Living Systems James Griesemer	89
6	Integrating Composition and Process in Levels of Developmental Evolution James DiFrisco	111
7	Manipulating Levels of Organization Alan C. Love	135

Contents

8	The Origin of New Levels of Organization Jan Baedke	153
9	Downward Causation and Levels James Woodward	175
10	Cancer beyond Genetics: On the Practical Implications of Downward Causation Sara Green	195
11	Multiscale Modeling in Inactive and Active Materials Robert W. Batterman	215
12	Using Compositional Explanations to Understand Compositional Levels: An Integrative Account Carl Gillett	233
13	Functional Kinds and the Metaphysics of Functional Levels: In What Sense Are Functionally Defined Kinds and Levels Nonarbitrary? Thomas A. C. Reydon	261
14	Control Hierarchies: Pattee's Approach to Function and Control as Time-Dependent Constraints Jon Umerez	279
15	Phenomenological Levels in Biological and Cultural Evolution Ilya Tëmkin	297
	Contributors Index	317 319

viii