## Contents

1	Downward Causation: An Opinionated Introduction MICHELE PAOLINI PAOLETTI AND FRANCESCO ORILIA	1 1
PAI	y Complexity in Fluman Development 178	
Do	Downward Causation and the Metaphysics of Causation	
2	Three Grades of Downward Causation	25
	FRANCESCO ORILIA AND MICHELE PAOLINI PAOLETTI	
3	Downward Causation	42
	JOHN HEIL A Tea linear troug the horizon. Indeed, now now	
4	Higher-Level, Downward and Specific Causation	54
	MAX KISTLER PROBLEMS AND AND STREET AND THE STREET	
5	Powers and Downward Causation	76
	BRASMUS MAYR STORE FOOD SOLID STANGED	
6	Emergence and Demergence	92
	BANN LILL ANJUM AND STEPHEN MUMFORD	
7	Power Mereology: Structural Powers versus	
	Substantial Powers	110
	MARMODORO GOUGGES DESCRIPTION SERVICE AND ENGINEER	
Bul	ODECARO AND MATTER SPASSOR AS A SECURIO SECURIO DE LA CARA CARA CARA CARA CARA CARA CARA C	
De	waward Causation and the Sciences	129
5	The Use of Downward Causation in Condensed	
	Matter Physics	131
	STEWART J. CLARK AND TOM LANCASTER	

## vi Contents

9	Prospects for Strong Emergence in Chemistry ROBIN F. HENDRY	146
10	Causality and Levels of Explanation in Biology MARTA BERTOLASO AND MARCO BUZZONI	164
11	The Interlacing of Upward and Downward Causation in Complex Living Systems: On Interactions, Self-Organization, Emergence and Wholeness LUCIANO BOI	180
12	Top-Down Causation in Biology and Neuroscience: Control Hierarchies WILLIAM BECHTEL	203
13	Early Complexity in Human Development FRANÇOIS JOUEN AND MICHÈLE MOLINA	225 uswawoti
14	Scientific Emergentism and Its Move beyond (Direct) Downward Causation CARL GILLET	242
	RT III wnward Causation, Mind and Agency	263
15	The Mental Causation Debate and Qua Problems SOPHIE C. GIBB	265
16	Agent-Causation—Neither Upward Nor Downward UWE MEIXNER	278
17	The Compatibility of Downward Causation and Emergence SIMONE GOZZANO	296
18	Three Views on Mental Downward Causation MARIO DE CARO AND MATTEO GRASSO	313
	Contributors Index	328 330