

# Contents

<b>1</b>	<b>Laws of Nature and the Problem of Exceptions</b> . . . . .	1
1.1	The Received View of Laws . . . . .	1
1.1.1	The Ubiquity of Laws . . . . .	1
1.1.2	Tracing the Development of the Received View . . . . .	2
1.2	Enter Exceptions . . . . .	4
1.2.1	Galileo's Idealizations . . . . .	4
1.2.2	Hempel, Cartwright and Giere on Physical Laws . . . . .	5
1.2.3	Fodor and Schiffer on Special Science Laws . . . . .	7
1.2.4	Taking Exceptions Seriously: Braddon-Mitchell and Schrenk . . . . .	9
1.3	Skeptical Solutions . . . . .	11
1.3.1	Hedging . . . . .	11
1.3.2	Concretization . . . . .	13
1.3.3	Selectivism . . . . .	16
1.3.4	Nomic Eliminativism . . . . .	18
1.4	A Taxonomy of Non-universal Laws . . . . .	21
1.4.1	Type-A: Ideal Laws . . . . .	21
1.4.2	Type-B: Ceteris Paribus Laws . . . . .	23
1.4.3	Type-C: Chancy Laws . . . . .	25
	References . . . . .	26
<b>2</b>	<b>Governing Law Solutions to Ideal Laws</b> . . . . .	29
2.1	Laws as Relations of Nomic Necessity . . . . .	29
2.1.1	Armstrong's Theory . . . . .	29
2.1.2	Iron Versus Oaken Laws . . . . .	31
2.1.3	Ideal Laws and Uninstantiated Laws . . . . .	34
2.2	Laws as Ascriptions of Capacities . . . . .	37
2.2.1	Cartwright's Theory . . . . .	37
2.2.2	Capacities for Ideal Laws . . . . .	40
2.2.3	Hüttemann's Capacities for Ideal Laws . . . . .	42

2.3	Scientific Essentialism . . . . .	45
2.3.1	Idealization as a Means to Uncover Essential <i>Natures</i> . . . . .	45
2.3.2	The Problem of Abstraction . . . . .	48
	References . . . . .	51
<b>3</b>	<b>Non-governing Law Solutions to Ideal Laws</b> . . . . .	<b>53</b>
3.1	The Best System Account . . . . .	53
3.1.1	Laws as Axioms in a Deductive System . . . . .	53
3.1.2	Considerations from Strength . . . . .	55
3.1.3	Considerations from Simplicity . . . . .	58
3.2	Better Best System Accounts . . . . .	62
3.2.1	Schrenk's Special Science Index Laws . . . . .	62
3.2.2	Unterhuber's Generic Construal . . . . .	64
3.3	The Inference-Ticket View . . . . .	69
3.3.1	Statements of Fact or Rules of Inference? . . . . .	69
3.3.2	Problems for the Inference-Ticket View . . . . .	71
	References . . . . .	75
<b>4</b>	<b>The Algorithmic Theory of Laws</b> . . . . .	<b>79</b>
4.1	Science and Data Compression . . . . .	79
4.1.1	Simplicity and Economy in Scientific Theory . . . . .	79
4.1.2	Compression as an Understanding of Simplicity . . . . .	82
4.1.3	Laws as Compression Algorithms . . . . .	84
4.2	The Theory Outlined . . . . .	89
4.2.1	Algorithmic Information Theory . . . . .	89
4.2.2	Laws of Nature as Maximal Compressors . . . . .	91
4.2.3	Objectivity and the Trivialization Problem . . . . .	95
4.3	Idealization and Lossy Compression . . . . .	100
4.3.1	Lossy Compression in Practice . . . . .	100
4.3.2	Predictive Redundancy . . . . .	103
4.3.3	Theory-Driven Data Processing . . . . .	105
	References . . . . .	108