

CONTENTS

Acknowledgments vii

Introduction: Chance in Evolution from Darwin to Contemporary Biology	1
<i>Grant Ramsey and Charles H. Pence</i>	

PART I The Historical Development and Implications of Chance in Evolution 13

1 Contingency, Chance, and Randomness in Ancient, Medieval, and Modern Biology	15
<i>David J. Depew</i>	
2 Chance and Chances in Darwin's Early Theorizing and in Darwinian Theory Today	41
<i>Jonathan Hodge</i>	
3 Chance in the Modern Synthesis	76
<i>Anya Plutynski, Kenneth Blake Vernon, Lucas John Matthews, and Daniel Molter</i>	
4 Is it Providential, by Chance? Christian Objections to the Role of Chance in Darwinian Evolution	103
<i>J. Matthew Ashley</i>	
5 Does Darwinian Evolution Mean We Are Here by Chance?	122
<i>Michael Ruse</i>	

PART 2 Chance in the Processes of Evolution 143

- 6 The Reference Class Problem in Evolutionary Biology:
Distinguishing Selection from Drift 145
Michael Strevens
- 7 Weak Randomness at the Origin of Biological Variation:
The Case of Genetic Mutations 176
Francesca Merlin
- 8 Parallel Evolution: What Does It (Not) Tell Us and Why Is It
(Still) Interesting? 196
Thomas Lenormand, Luis-Miguel Chevin, and Thomas Bataillon

PART 3 Chance and Contingency in the History of Life 221

- 9 Contingent Evolution: Not by Chance Alone 223
Eric Desjardins
- 10 History's Windings in a Flask: Microbial Experiments
into Evolutionary Contingency 244
Zachary D. Blount
- 11 Rolling the Dice Twice: Evolving Reconstructed Ancient
Proteins in Extant Organisms 264
Betul Kacar
12. *Wonderful Life* Revisited: Chance and Contingency
in the Ediacaran-Cambrian Radiation 277
Douglas H. Erwin

References 299

Contributors 347

Index 351