Contents

Part One **Simple Structures**

Chapter 1 Causal-Loop Diagramming 3

Chapter 2 Positive Feedback Structure 13

Chapter 3 Negative Feedback Structure 35

Chapter 4 S-Shaped Growth Structure 67

Chapter 5 Review of Simple Structures: Industrial Land-Use Model 93

Part Two **Exercises in Simple Structures**

Exercise 1 Causal-Loop Diagramming 137
Solution 141

Exercise 2 Graphical Integration 149
Solution 155

Exercise 3 Flow Diagramming 161
Solution 165

Exercise 4 Positive Feedback 167
Solution 171

Exercise 5 Negative Feedback: Application to Population Decay 175
Solution 179

Exercise 6 Negative Feedback: Application to Inventory Control 183
Solution 189

Exercise 7 First-Order Linear Systems 193
(with Dennis L. Meadows)
Solution 203

Exercise 8 Simple Structures 209
Solution 211

Part Three **Exercises in Analysis and Conceptualization**

Exercise 9 Delays: Exercise and Supplementary Notes 219
by Dennis L. Meadows
Solution 249

Exercise 10 Commodity Production Cycle Model 257
by Dennis L. Meadows
Solution 267

Exercise 11 Analysis of Market Growth Model 281
by Narendra K. Patni
Solution 299

Exercise 12 Residential Community Model 309
by Michael R. Goodman
Solution 313

Exercise 13 Future Electronics Model 349
by Edwin N. Jarmain
Solution 353

Exercise 14 Yellow-Fever Model 365
by Kjell Kalgraf
Solution 369

Exercise 15 Kaibab Plateau Model 377
by Michael R. Goodman
Solution 381