

Brief Contents

Part I

Fundamentals of Physiology 1

- 1 Animals and Environments:
Function on the Ecological Stage 3
- 2 Molecules and Cells in Animal Physiology 29
- 3 Transport of Solutes and Water 65

Part II

Food, Energy, and Temperature 91

- 4 Nutrition, Feeding, and Digestion 93
- 5 Energy Metabolism 125
- 6 Aerobic and Anaerobic Forms of Metabolism 149
- 7 The Energetics of Aerobic Activity 175
- 8 Thermal Relations 191
- 9 Food, Energy, and Temperature at Work:
The Lives of Mammals in Frigid Places 241

Part III

Integrating Systems 257

- 10 Neural and Endocrine Control, Nervous Systems,
and Biological Clocks 259
- 11 Neurons 281
- 12 Synapses 313
- 13 Sensory Processes 347
- 14 Endocrine and Neuroendocrine Physiology 389
- 15 Reproduction 423
- 16 Integrating Systems at Work: Animal Navigation
447

Part IV

Muscle and Movement 463

- 17 Muscle 465
- 18 Control of Movement:
The Motor Bases of Animal Behavior 489
- 19 Muscle and Movement at Work: Muscle in Human
Health and Disease 511

Part V

Oxygen, Carbon Dioxide, and Internal Transport 525

- 20 Introduction to Oxygen and Carbon Dioxide
Physiology 527
- 21 External Respiration:
The Physiology of Breathing 541
- 22 Transport of Oxygen and Carbon Dioxide in Body
Fluids (With an Introduction to Acid–Base
Physiology) 577
- 23 Circulation 609
- 24 Oxygen, Carbon Dioxide, and Internal Transport at
Work: Diving by Marine Mammals 643

Part VI

Water, Salts, and Excretion 663

- 25 Water and Salt Physiology:
Introduction and Mechanisms 665
- 26 Water and Salt Physiology of Animals in Their
Environments 685
- 27 Kidneys and Excretion
(With Notes on Nitrogen Excretion) 721
- 28 Water, Salts, and Excretion at Work:
Mammals of Deserts and Dry Savannas 757