

CONTENTS

Section 1

GENERAL PHYSIOLOGICAL PROCESSES

Edited by Irving L. Schwartz

- 1. By Way of Introduction—The Cell** 1-1
By Sandra K. Masur, Roderich Walter, and Irving L. Schwartz
- 2. Physicochemical Properties, Permeability, and Transport Functions of Cell Membranes** 1-15
By Irving L. Schwartz, Roderich Walter, Martin Fein
and Herman R. Wyssbrod
- 3. Excitation, Conduction, and Transmission of the Nerve Impulse** 1-29
By Irving L. Schwartz and George J. Siegel
- 4. Excitation and Contraction of Muscle** 1-61
By Irving L. Schwartz and Zia J. Penefsky
- 5. Amino Acids and Proteins: The Molecular Framework and Machinery of Living Systems** 1-114
By Irving L. Schwartz and Martin Fein
- 6. Physiology of Purines and Pyrimidines** 1-142
By Roderich Walter and Paula L. Hoffman
- 7. Nucleic Acids and Gene Activity** 1-158
By Anthony C. Traketellis (with the assistance of) Terry Krulwich

Section 2

DIGESTION

Edited by N. C. Hightower, Jr., and Henry D. Janowitz

- 1. Control of Food and Water Intake** 2-1
- 2. Innervation and Visceral Sensations of the Gastrointestinal Tract** 2-8
- 3. Gastrointestinal Hormones** 2-15
- 4. Salivary Secretion** 2-17
- 5. Gastric Secretion** 2-31
- 6. Pancreatic Secretion** 2-49
- 7. Biliary Secretion** 2-60
- 8. Secretion and Absorption in the Intestine** 2-79
- 9. Movements of the Alimentary Canal** 2-95

Section 3

CIRCULATION

Edited by David K. Detweiler

1. The Cardiovascular System	3-1
2. The Heart: Gross Structure; Myocardial Cells	3-25
3. Electrophysiology of the Heart	3-48
4. Mechanical Activity of the Heart	3-86
5. Regulation of the Heart	3-110
6. The Coronary Circulation	3-130
7. Measurement of Blood Pressure and Flow	3-148
8. Control Mechanisms of the Circulatory System	3-164
9. Regulation of Systemic and Pulmonary Circulation	3-189
10. Circulation through Brain, Skin, and Skeletal Muscle	3-211
11. Splanchnic, Renal, and Fetal Circulations	3-224

Section 4

BLOOD AND LYMPH

Edited by Eugene P. Cronkite

1. Blood and Lymph: General Properties, Composition and Functions	4-1
2. Hemopoiesis: A Vital Cell Renewal System	4-10
3. The Erythrocyte	4-21
4. Hemoglobin	4-41
By C. Robert Valeri	
5. Transfusions: The Blood Groups	4-48
By C. Robert Valeri	
6. Hemolysis and Suspension Stability of the Blood	4-57
By C. Robert Valeri	
7. Granulocytes	4-62
8. Thrombopoiesis, Hemostasis, Coagulation, and Thrombosis	4-73
9. The Lymphatics, Lymph, and Tissue Fluids	4-83
10. Lymphoreticular System and the Lymphocyte	4-90
11. Regulation of the Hydrogen Ion Concentration of Body Fluids	4-103
By Robert A. Aronson	
12. Fluid Distribution and Exchange	4-113

Section 5

THE EXCRETION OF URINE

Edited by Robert W. Berliner

1. Urine Formation	5-1
2. Pathological Physiology of the Kidney. Micturition	5-38
By Ralph A. Straffon	

Section 6**RESPIRATION**Edited by William B. Youmans and Arthur A. Siebens

1. Uptake and Delivery of the Respiratory Gases	6-1
By William E. Stone	
2. Pulmonary Gas Exchange	6-20
By Arthur A. Siebens	
3. The Mechanics of Breathing	6-28
By Arthur A. Siebens	
4. Control of Breathing	6-41
By William B. Youmans	
5. Hypoxia, Asphyxia, Dysbarism, Oxygen Therapy, and Resuscitation	6-63
By William B. Youmans	

Section 7**ENDOCRINE CONTROL SYSTEMS**Edited by Howard E. Morgan

1. Introduction to Endocrine Control Systems	7-1
Howard E. Morgan	
2. Control of the Anterior Lobe of the Pituitary Gland	7-8
Wesley C. Hymer	
3. Control of the Posterior Lobe of the Pituitary Gland	7-24
Howard E. Morgan	
4. Control of Thyroid Function	7-29
Glenn E. Mortimore	
5. Control of Calcium Homeostasis by Parathyroid Hormone, Calcitonin, and Vitamin D	7-42
Carol F. Whitfield	
6. Function of the Adrenal Glands	7-50
David N. Orth	
7. Hormonal Control of the Pancreatic Islets	7-76
Glenn E. Mortimore	
8. Sexual Differentiation	7-88
C. Wayne Bardin	
9. Hormonal Control of Gonadal Function	7-95
C. Wayne Bardin	
10. Control of Carbohydrate Metabolism in Muscle	7-112
James R. Neely	
11. Control of Fatty Acid Metabolism in Adipose Tissue	7-123
James R. Neely and John F. Oram	
12. Control of Gluconeogenesis, Ketogenesis, and Lipogenesis in Liver	7-132
Leonard S. Jefferson	
13. Hormonal Control of Growth and Protein Metabolism	7-143
Howard E. Morgan	

Section 8

SENSATION

Edited by John Lott Brown

1. Sensory Systems	8-1
2. Hearing	8-10
3. Vestibular Function	8-40
4. Vision	8-63
5. Taste	8-121
6. Olfaction	8-132
7. Touch, Temperature, and Pain Sensitivity	8-144

Section 9

NEURAL CONTROL SYSTEMS

Edited by John R. Brobeck

1. Analysis of Neural Control Systems	9-1
2. Organization of the Central Nervous System	9-20
3. Control of Smooth Muscle and Exocrine Glands	9-53
4. Control of Skeletal Muscle	9-66
5. Subcortical Mechanisms Controlling Posture and Locomotion	9-88
6. Cortical Control Systems	9-104
7. Control Systems That Establish Regulations	9-121
8. Higher Neural Functions	9-137
9. Disorders of Neural Control	9-161

INDEX