

# CONTENTS

<i>List of Contributors</i> . . . . .	ix
<i>Preface</i> . . . . .	xi
<b>Chapter 1. Behavioral Studies of the Molecular Basis of Memory</b> <i>Georges Chapouthier</i> . . . . .	
I. Introduction . . . . .	1
II. Chemical Changes Associated with Learning . . . . .	2
III. Effect of Inhibitors of RNA and Protein Synthesis on Learning . . . . .	3
IV. Bioassay Methods for the Chemical Correlates of Learning . . . . .	8
V. Conclusions . . . . .	17
References . . . . .	17
<b>Chapter 2. Protein Synthesis and Memory</b> <i>D. A. Booth</i>	
I. Possible Relationships of Protein Synthesis to Memory . . . . .	27
II. Increases in Amount of Protein . . . . .	35
III. Radioisotopic Estimation of Protein Synthesis . . . . .	41
IV. Changes in Control of Protein Synthesis . . . . .	48
V. Biochemical Pharmacology of Protein Synthesis . . . . .	51

	VI. Biochemistry and Memory Research . . . . .	53
	References . . . . .	54
<b>Chapter 3.</b>	<b>The Cholinergic Synapse and the Site of Memory</b>	
	<i>J. Anthony Deutsch</i>	
	I. Introduction . . . . .	59
	II. Experimental Investigations . . . . .	61
	III. Conclusions . . . . .	74
	References . . . . .	75
<b>Chapter 4.</b>	<b>Drug Facilitation of Learning and Memory</b>	
	<i>Ronald G. Dawson and James L. McGaugh</i>	
	I. Methodological Difficulties . . . . .	78
	II. Performance Effects . . . . .	81
	III. State Dependency . . . . .	82
	IV. Posttraining Injections . . . . .	82
	V. The Question of Mechanism . . . . .	95
	VI. Behaviorally Oriented Research . . . . .	96
	VII. Learning Situations Indirectly Related to Learning and Memory . . . . .	98
	VIII. Summary . . . . .	100
	References . . . . .	104
<b>Chapter 5.</b>	<b>Electroconvulsive Shock and Memory</b>	
	<i>J. Anthony Deutsch</i>	
	I. Other Explanations of ECS Effects . . . . .	115
	II. The Permanence of ECS Effects . . . . .	117
	III. Is ECS Amnesia Immediate? . . . . .	118
	IV. Effects of ECS on Older Habits . . . . .	119
	V. Cholinergic Systems and ECS . . . . .	120
	VI. ECS Amnesia as Accelerated Forgetting . . . . .	120
	References . . . . .	121
<b>Chapter 6.</b>	<b>Electrophysiological Analyses of Learning and Memory</b>	
	<i>Arnold L. Leiman and Clifford N. Christian</i>	
	I. Introduction . . . . .	126
	II. Habituation . . . . .	130
	III. Associative Learning . . . . .	150
	References . . . . .	166
<b>Chapter 7.</b>	<b>Self-Stimulation: The Neurophysiology of Reward and Motivation</b>	
	<i>C. R. Gallistel</i>	

- I. Introduction . . . . . 176
- II. Self-Stimulation: Salient Characteristics . . . . . 184
- III. Theoretical Interpretations . . . . . 208
- IV. The Structure and Neurophysiology of the  
Self-Stimulation System . . . . . 218
- V. Summary . . . . . 256
- References . . . . . 257

**Chapter 8. Spreading Depression: A Behavioral Analysis**

*Allen M. Schneider*

- I. The Neural Properties of Spreading Depression  
Relevant to Behavioral Research . . . . . 271
- II. Methodological Requirements for Using Spreading  
Depression in Behavioral Research . . . . . 273
- III. The Behavioral Effects of Spreading Depression . . . . . 274
- IV. Applications of the Technique of Spreading Depression . . . . . 290
- V. Conclusion . . . . . 299
- References . . . . . 299

**Chapter 9. Brain Lesions and Memory in Animals**

*Susan D. Iversen*

- I. Introduction . . . . . 305
- II. The Role of the Frontal Lobes in Memory Processes . . . . . 310
- III. The Role of the Temporal Lobe in Memory Processes . . . . . 321
- IV. Synthesis . . . . . 337
- References . . . . . 356

**Chapter 10. An Analysis of Short-Term and Long-Term  
Memory Defects in Man**

*Elizabeth K. Warrington and L. Weiskrantz*

- I. Introduction . . . . . 365
- II. The Amnesic Syndrome . . . . . 366
- III. Short-Term Memory Defects . . . . . 384
- IV. Conclusions and Summary . . . . . 390
- References . . . . . 392

**Chapter 11. What Have the Animal Experiments Taught  
Us About Human Memory?**

*Donald A. Norman*

- I. On Animal and Human Studies . . . . . 397
- II. Models of Human Memory . . . . . 399
- III. Sensory Addressable Storage . . . . . 403
- IV. Organization of Memory . . . . . 404

V. Experimental Considerations . . . . .	406
VI. The Structure of Memory . . . . .	410
References . . . . .	413
<i>Author Index</i> . . . . .	415
<i>Subject Index</i> . . . . .	431