

CONTENTS

General Introduction	1
I. Physiological Basis of Learning and Memory Storage	
I1. Some Properties of a Neural Model for Memory (with J. A. Anderson, M. Nass, W. Freiberger, and U. Grenander)	3
I2. A Possible Organization of Animal Memory and Learning	11
I3. A Theory for the Development of Feature Detecting Cells in Visual Cortex (with M. Nass)	27
I4. A Theory for the Acquisition and Loss of Neuron Specificity in Visual Cortex (with F. Liberman and E. Oja)	45
I5. Seat of Memory (with M. Imbert)	67
I6. Theory for the Development of Neuron Selectivity: Orientation Specificity and Binocular Interaction in Visual Cortex (with E. Bienenstock and P. Munro)	77
I7. Mean-Field Theory of a Neural Network (with C. L. Scofield)	97
I8. Cortical Plasticity: Theoretical Analysis, Experimental Results	103
I9. A Physiological Basis for a Theory of Synapse Modification (with M. Bear and F. Ebner)	121
I10. Molecular Mechanisms for Synaptic Modification in the Visual Cortex: Interaction Between Theory and Experiment (with M. Bear)	131
I11. Synaptic Plasticity in Visual Cortex: Comparison of Theory with Experiment (with E. Clothiaux and M. Bear)	161
I12. Objective Function Formulation of the BCM Theory of Visual Cortical Plasticity: Statistical Connections, Stability Conditions (with N. Intrator)	183
I13. Homosynaptic Long-Term Depression in Area CA1 of Hippocampus and Effects of <i>N</i> -Methyl-D-Aspartate Receptor Blockade (S. Dudek and M. Bear)	199
I14. Common Forms of Synaptic Plasticity in the Hippocampus and Neocortex in Vitro (A. Kirkwood, S. Dudek, J. Gold, C. Aizenman, and M. Bear)	205
I15. Formation of Receptive Fields in Realistic Visual Environments According to the Bienenstock, Cooper, and Munro (BCM) Theory (with C. Law)	211

II6.	Effect of Eye Misalignment on Ocular Dominance According to BCM and PCA Synaptic Modification (with H. Shouval, N. Intrator, and C. C. Law)	217
II7.	Theory of Synaptic Plasticity in Visual Cortex (with N. Intrator, M. Bear, and M. Paradiso)	233
II. Neural Networks		
II1.	A Neural Model for Category Learning (with C. Elbaum and D. Reilly)	255
II2.	Pattern Class Degeneracy in an Unrestricted Storage Density Memory (with C. Scofield, D. Reilly, and C. Elbarum)	265
II3.	Learning System Architectures Composed of Multiple Learning Modules (with D. Reilly, C. Scofield, and C. Elbaum)	265
II4.	A Relaxation Model for Memory with High Storage Density (with C. Bachmann, A. Dembo, and O. Zeitouni)	285
II5.	Coulomb Potential Learning (with M. Perrone)	285
(Fortune Teller)		
II6.	An Overview of Neural Networks: Early Models to Real World Systems (with D. Reilly)	299
II7.	Hybrid Neural Network Architectures: Equilibrium Systems that Pay Attention	323
II8.	When Networks Disagree: Ensemble Methods for Hybrid Neural Networks (with M. Perrone)	341
II9.	Learning from What's Been Learned: Supervised Learning in Multi-Neural Network Systems (with M. Perrone)	341
II10.	A Model of Prenatal Acquisition of Speech Parameters (with B. Seebach, N. Intrator, and P. Lieberman)	363
II11.	The Ni1000: High Speed Parallel VLSI for Implementing Multilayer Perceptrons (with M. Perrone)	369
II12.	Thought and Mental Experience: The Turing Test	379
A Final Few Words		
(Monet's Sunrise)		