chondrial DNA. In his speculations about the functions of these membrane-bound macromolecules Lerner considers such potential interactions as the union between antigen and M-Ig causing a conformational change in the membrane leading to either DNA replication or transcription which in turn may result in gene amplification or activation of biosynthetic processes. Moreover, the membrane-associated DNA may play a role in intercellular communications such as the interactions of B and T cells.

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Cyclic AMP

Advances in Cyclic Nucleotide Research. PAUL GREENGARD and G. ALAN ROBISON, Eds. Vol. 1, Physiology and Pharmacology of Cyclic AMP. 610 pp., illus. $29.50. Vol. 2, New Assay Methods for Cyclic Nucleotides. 144 pp., illus. $12.50. A conference, Milan, July 1971. PAUL GREENGARD, G. ALAN ROBISON, and RODOLFO PAOLETTI, Eds. Raven, New York, 1972.

The presentations in the "Physiology and Pharmacology" volume of these proceedings are concerned with three major aspects of cyclic AMP function: the nature and function of cyclic AMP-dependent protein kinases, the events controlling the activity of adenyl cyclase and thus the level of cyclic AMP, and the correlation of these changes with various aspects of cellular function. The papers are arranged in groups on regulation of metabolism, membrane permeability and secretion, the response of the cardiovascular system, the peripheral and central nervous system, and pituitary and reproductive function. A short section is devoted to studies on the involvement of cyclic AMP in the regulation of gene transcription in unicellular organisms, and a final section provides abstracts of 91 unpublished papers presented at the meeting.

This volume clearly illustrates to the reader the importance of cyclic AMP as an obligatory component in cellular function and as a major participant in intracellular communication and response of the cell to the environment. Although it is too early to postulate a single mechanism for the action of cyclic AMP, the similarities of the molecular events involving cyclic AMP in the hormonal control of glycogenolysis, glycogenesis, and lipolysis suggest that activation or modulation of cyclic AMP–dependent protein kinases resulting in the phosphorylation of phosphorylase kinase, glycogen synthetase, and triglyceride lipase respectively provides an excellent model for the diverse physiological and biochemical events involving adenylcyclase. Certainly the wide distribution of cyclic AMP–dependent protein kinases and the discovery of a variety of specific protein substrates for these kinases, ranging from histones, thought to be involved in gene expression, to a component of synaptic membranes, make this a primary hypothesis for the mechanism controlling adenylcyclase activity. The specificity of response inherent in the structure of protein kinases also provides an explanation for the multiple responses of cells to changes in adenylcyclase activity.

Much of this volume concerns the current efforts to elucidate the relation between the interaction of hormones and other agents at membrane receptor sites and the subsequent response of adenylcyclase. While little is known about how the hormone-receptor interaction leads to a change in the intracellular, membrane-bound catalytic activity of adenylcyclase, the number of agents or actions that modify the activity is very large, including most of the accepted hormones and even such agents as light, which has been shown to modify the activity of the photoreceptor adenylcylase of vertebrates. Other agents such as calcium ions, adenosine, and prostaglandins are involved in the regulation of adenylcyclase activity. Perhaps the most exciting matter dealt with in the book is the correlation of factors that affect impulse conduction by neurons with the activity of adenylcyclase. Several experimental approaches toward understanding the complex role of cyclic AMP in synaptic transmission, including studies with brain slices, isolated ganglia, neuronal cell culture systems, and interactions between specific pathways in the intact brain, are described. These studies appear to point towards an understanding of the biochemical basis of cellular communication, the basis for learning and memory.

The second volume of the proceedings, consisting of nine papers dealing with methodology, is a useful companion to the first.

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The Mind-Body Problem

Brain and Human Behavior. A symposium, Chicago, Oct. 1969. A. G. KARCZMAR and J. C. ECCLES, Eds. Springer-Verlag, New York, 1972. xii, 476 pp., illus. $30.50.

Unlike the usual symposium, in which a number of scientists investigating a single problem get together to compare notes and try to iron out discrepancies in their results, the Symposium on Brain and Human Behavior, held in 1969 as part of Loyola University's centennial program, was more in the nature of an interdisciplinary conference. Well-known experts in many areas of neuroscience, and some philosophers, presented papers that were in many cases excellent in themselves but unrelated to each other.

A possible explanation for the diffuseness of content (and for the somewhat misleading title; all the brains and most of the behavior pertain to experimental animals, not man) is that the symposium was organized with the idea of setting the stage for a powerful assault on the mind-body problem. This is the interpretation I put on the presence of the philosophical contingent and the tone of the introduction, which was written by the chief organizer of the symposium and editor of the volume, Alexander Karczmar. This ambitious hope was not realized, however, and Karczmar reveals his acceptance of the fact in his opening remark that the conference might have been a hundred years premature. It was, nevertheless, an interesting experiment, and even if there are few signs in the published volume that any of the participants benefited from hearing the others, it is possible that latent influences were planted that will germinate in less than a hundred years.

The symposium itself might well have served a useful purpose, but it is difficult to think of any group (other than librarians) who would get their money's worth from the published collection of papers based upon it. There are five sections, which bear the titles Molecular and Synaptic Organization, Biochemical Mechanisms and Pharmacological Approaches, Neurophysiological Correlates, Psychological Aspects, and Epistemological Aspects. Few of the contributors make any concession to the possibility that some of their audience might not be specialists in the fields they are discussing, so the book can hardly be recommended as a lay introduction to the neurosciences. At the