

BOOK REVIEWS

CHEMISTRY OF BRAIN ACTIVITY

Molecular Basis of Some Aspects of Mental Activity

Edited by Otto Walaas. (Proceedings of a NATO Advanced Study Institute held at Drammen, Norway, August 2-14, 1965.) Vol. 1: Pp. xv+476. (London: Academic Press, Inc. (London), Ltd.; New York: Academic Press, Inc., 1967.) 110s.

THIS is the first of two volumes which contain the proceedings of the NATO meeting. It carries twenty-eight contributions which vary greatly in their quality and in their relation to mental phenomena.

The mental activities to which its introduction and opening papers are oriented are those of learning and memory, approached first in terms of a particular model system. O. Hechter and C. E. Robinson have sought to apply current concepts of nucleic acid and protein metabolism to develop a theory of memory and recall. This merits serious consideration, although its present support comes largely through analogies to information transfer in genetic systems. The account of directly related experimental work is not convincing; after a subsequent paper "Facilitation of Learning in Rats by Intracisternal Injection of RNA from the Brain of Trained Rats", the recorded discussion displays appropriate scepticism. Other contributions, however, are related in illustrating the importance of protein metabolism to the brain, in giving details of protein synthesis in bacterial and tumour cells, and in describing protein interactions which can condition the growth of neural systems.

Subsequent sections concern inherited metabolic errors, with accounts of phenylketonuria and galactosaemia, the mechanism of hormone action, and biologically active amines. These include valuable accounts of cyclic 3,5-adenosine monophosphate specifically in relation to neural systems; indeed, the mammalian brain is the richest known source of enzymes forming and degrading the cyclic phosphate. Accounts of serotonin and noradrenaline illustrate electrophysiological and pathological approaches to mental phenomena, and an account of the retina and visual pathway contributes an anatomical viewpoint. Some contributions claim no specific relationship to mental activities, such as those describing lactic dehydrogenase isoenzymes and glutaminases, and Cori's excellently factual account of the phosphorylases of liver, muscle and potato. Nevertheless, substrates of the dehydrogenase, glutaminase and phosphorylase, as they operate in the brain *in vivo*, include compounds which change in concentration with changed cerebral activities.

Discussion sections follow most of the papers and add much to the value of the book; it also carries author and subject indexes.

H. McILWAIN

INTRACELLULAR MEMBRANES

Intracellular Membraneous Structure

Edited by S. Seno and E. V. Cowdry. (Proceedings of the First International Symposium for Cellular Chemistry at Ohtsu, March 27-31, 1963.) Pp. xix+588. (Okayama, Japan: Japan Society for Cell Biology, 1967.) n.p.

FOR many purposes cells have been conveniently regarded as bags of enzymes surrounded by a selectively permeable

membrane. Enzyme studies began by homogenization to obtain a solution or suspension for assay; flux studies assumed that the cell interior behaved as a single undivided compartment. This concept was, of course, a simplification; even before the development of the electron microscope, subdivisions of the cell interior were obvious. Since then a wealth of detailed information has been gained concerning the structure and function of cell organelles. It is a striking fact that many of these organelles consist of membranes arranged in a complex and specific manner; and it is becoming increasingly clear that their functions depend essentially on the character and arrangement of the membranes.

The symposium recorded in this volume brought together electron microscopists, cytochemists, cell physiologists and biochemists, so that there is a full treatment of each topic. The important cellular membranes are dealt with in turn: endoplasmic reticulum, mitochondria, Golgi complex, nuclear membrane and plasma membrane. The standard of the individual papers is very variable, ranging from some masterly reviews of the latest research (such names as Fawcett, Green, Sjöstrand, Novikoff, Robertson and Holter speak for themselves), to some rather disappointing papers, which review older work or are largely speculative. There are also many interesting accounts of more detailed experimental work, mainly by Japanese authors.

Perhaps the weakest section is the final one on transport processes through membranes. Three of the most interesting papers are not really relevant to the subject: a discussion of the role of moving membranes in active transport relies on morphological evidence, unsupported by the quantitative data which are essential in this field; and a paper on cellular water is best described in the words of the author—"All this, and more, is pure speculation". In this section only the interesting paper of Onoé and Ohno on fat absorption can be regarded as a contribution to knowledge of membrane transport.

Minor defects are frequent misprints and poor English. Some of the reviews also suffer from the delay of four years in publication, which may be connected with the tragic death of two of the Japanese conveners shortly after the conference.

In spite of its defects, the coverage of this symposium is unique and the volume is highly recommended reading for those interested in cell biology. The volume is dedicated to the late Dr Seizo Katsunuma.

D. A. T. DICK

YEAST PROTOPLAST SYMPOSIUM

Symposium über Hefe-Protooplasten/Symposium on Yeast Protoplasts, Jena, 21 bis 24 September 1965

(Abhandlungen der Deutschen Akademie der Wissenschaften zu Berlin, Klasse für Medizin, Jahrgang 1966, Nr. 6). Herausgegeben von Rudolf Müller. Pp. vi+430. (Berlin: Akademie-Verlag, 1967.) 61.50 D.M.

It often seems that research on yeasts is pursued less actively than on other groups of micro-organisms, for only occasional papers appear in the commonly read microbiological journals. It is therefore a pleasant diversion to find a symposium almost entirely devoted to yeasts. Fifty-one papers are included, of which thirty-three are in English and eighteen in German, with English summaries. Many of the papers have only a tenuous connexion with the subject of yeast protoplasts; eight of the papers are not even concerned with yeasts. The volume offers, however, a very thorough coverage of recent yeast research, especially in the countries of Eastern Europe. The papers are grouped in five sections: microscopic and submicroscopic structure of yeast protoplasts (eight papers), structure and biosynthesis of yeast cell walls (thirteen papers), physiological and biochemical