

made on the use of such mutants in elucidating the biochemistry of virus replication. The last chapter is concerned with interferon and with its mode of action.

This completes the first part of this survey of animal viruses, showing very successfully the extent to which they are now understood in the terms of molecular biology. The format, with chapter summaries and a good selection of recent references, will make this a particularly valuable book for teaching, and for any virologist who wants to get information on the basic properties of a given virus quickly.

L. V. CRAWFORD

MEMBRANOLOGY

Membrane Models and the Formation of Biological Membranes

Edited by Liana Bolis and B. A. Pathica. (Proceedings of the 1967 meeting of the International Conference on Biological Membranes. NATO Advanced Study Institute.) Pp. xv + 337. (North-Holland: Amsterdam, 1968.) 112s.

I WELCOME this volume because of the tribute to, and photographic reminder of, Jack Henry Schulman. He was a unique contributor to our knowledge of membranes, in print and in conference. Few readers will remain unmoved by the spontaneous dedication of an included article to Schulman's memory.

The printed contributions to the conference reflect the important growing areas of membrane research; predictably one finds articles on water, lipid, protein structure and function, of both real and artificial membranes (are liposomes not to be taken seriously yet?). One sincerely hopes that the monolayer model will not fall into disrepute as a result of Schulman's untimely death.

The authoritative articles are too numerous to comment upon individually, but I am now delighted to possess an authentic and up to date version of Torsten Teorell's potted history of membranology.

The inevitable type errors are present including a charming pair which suggest that both *Proceedings of the National Academy of Sciences* and *Nature* were in production in the eleventh century AD. A more serious oversight by the editors is a set of figures with illegible scripts.

A catch phrase by Tom Lehrer came to my mind after reading the editorial preface; the phrase, "doing well by doing good", cynically aimed by Lehrer at drug pedlars, could be stily directed towards the publishers. One wonders which side of the Lehrer equation is the primary driving force for this sort of publication which was openly subsidized by the sponsors of the original conference. I suppose the economic fact of the situation is that only contributors, reviewers and some libraries will end up with copies.

A. D. BANGHAM

HAPTOGLOBINS IN MAN

The Haptoglobin Groups in Man

By R. L. Kirk. (Monographs in Human Genetics, Vol. 4.) Pp. vi + 77. (S. Karger: Basle and New York, June 1968.) 20 Sw. francs; 40s; \$4.80.

ABOUT one fifth of the α_2 -globulin fraction of human plasma is haptoglobin, a glycoprotein that binds free haemoglobin and conserves iron by prevention of glomerular excretion. A haptoglobinaemia, through depletion, occurs in conditions causing intravascular haemolysis, but a puzzling feature is the absence or virtual absence of haptoglobin in quite numerous healthy persons. Production is probably dependent on genetic factors other than those responsible for the haptoglobin polymorphism

revealed by the elegant starch-gel electrophoresis technique devised by Smithies and his colleagues.

On starch-gel electrophoresis at pH 6.8 in borate buffer, sera from Hp 1-1 persons give a single band a little behind that formed by free haemoglobin. Hp 2-2 persons show no band in the position of the Hp 1-1 component but a series of slower moving bands of diminishing intensity towards the origin. The heterozygote Hp 2-1 pattern is a series of bands of slightly greater mobility than those of Hp 2-2, together with a band in the Hp 1-1 position. An Hp 2-1 (modified) phenotype fairly common in Africans shows a pattern in which the slower bands of Hp 2-1 are absent with increased density of the fastest bands. The multiple band formation is consequent on a tendency of the Hp^2 gene to form polymers, incorporating the product of the Hp^1 gene where this is present. Differences in mobility result partly from molecular size, the larger Hp 2 molecule moving more slowly through the starch-gel pores.

Though mainly concerned with the haptoglobin groups, this excellent monograph is more comprehensive than its title indicates; almost all that is known about the haptoglobins is covered in less than eighty easily readable pages. There is a well-selected bibliography. Tables showing group frequencies reported in most parts of the world are provided but, it is pointed out, are of limited anthropological value because of undoubted observation errors. The author deals especially well with the African types considered to have been the main cause of difficulty. Forensic application of the haptoglobin groups is rather briefly considered. The book is illustrated with some good diagrams, but addition of photographs would assist the reader not familiar with the appearances described.

It is disappointing to find a work of this standard blemished by poor proof correction, but this is a minor fault in an excellent monograph assured of recognition as a standard text on the haptoglobin groups. A. GRANT

ANCIENT LAKE BASINS

Introduction to Paleolimnology

By C. C. Reeves, jun. (Developments in Sedimentology, Vol. 11.) Pp. xii + 228. (Elsevier: Amsterdam, London and New York, 1968.) 130s.

THIS book is written by a geologist and adopts the geological definition of palaeolimnology. This is "the study of ancient lake basins", most of which no longer contain lakes but are dry flat areas which may intermittently be covered by water. Professor Reeves devotes two of the three parts into which the book is divided to a discussion of certain principles of limnology—the study of existing lakes; these sections, entitled respectively "The Lake Basin" and "The Lake", are illustrated by reference to existing as well as to extinct lakes. Three chapters in the second section deal with the sediments of extinct lakes. The third section, called "The Paleolake Basin", includes a comprehensive account of the techniques by which the sediments of palaeolakes may be studied, and the deductions as to Pleistocene climates which can be made from such studies.

The practising limnologist will look in vain, in this book, for any mention of the study of the sediments and history of existing lakes, which is what "palaeolimnology" usually means to limnologists. The interpretation of palaeolimnology as the study of extinct lakes has the support of that distinguished geologist and palaeolimnologist W. H. Bradley, whose chapter on palaeolimnology in *Limnology in North America* (1963, edited by D. G. Frey) also deals with the sediments and history of extinct lakes. Nevertheless, in view of the volume of knowledge of the sediment profiles of existing lakes in all parts of the world which has accumulated