VIRUSES, GENES AND ANTIGENS

Advances in Virus Research

Vol. 5. Edited by Kenneth M. Smith and Max A. Lauffer. Pp. ix+376. (New York: Academic Press, Inc.; London: Academic Books, Ltd., 1958.) 9.50 dollars.

PROBABLY what most people first want to know about a collection of review articles is: Who is writing and what about? This is easily answered: J. B. Brooksby on "The Virus of Foot-and-Mouth Disease"; Herbert A. Wenner on "Psittacosis-Lymphogranuloma Group of Viruses"; Gunther S. Stent on "Mating and Reproduction of Bacterial Viruses"; G. Bertani on "Lysogeny"; Ph. L'Héritier on "The Hereditary Virus of Drosophila"; Forest Fulton on "The Measurement of Complement Fixation by Viruses"; Anne Buzzell and Martin Hanig on "The Mechanism of Hemagglutination by Influenza Virus"; but to comment usefully on this collection in a brief notice is more difficult. From the many facts and much speculation, what perhaps emerges most obviously is how disparate is knowledge about different groups of viruses and how varied are the techniques and types of approach to their study.

The first two articles are primarily concerned with viruses as pathogens, summarizing general properties, host ranges and the like. Information on the constitution of members of the Psittacosis group is much needed, for these are exceptional in that some diseases they cause are amenable to chemotherapy, suggesting they may be chemically more complex than smaller viruses. The next three articles are concerned with pathogenicity only as an experimental tool. The two on bacteriophages are excursions into radiobiology, genetics, the replication of nucleic acid, and the relationships between nucleic acid and protein synthesis, subjects for which these systems provide elegant experimental material and results rich in their scope for speculation. The juxtaposition of the article on the *Drosophila* virus and lysogeny stresses the similarities between the two systems and makes almost irresistible the temptation to extrapolate from the knowledge about bacteriophages to the constitution of the *Drosophila* virus about which nothing is known. That this virus was for long accepted as an example of cytoplasmic inheritance vividly illustrates how difficult it can be to define the boundaries between genetics and pathology.

The last two articles are not at all concerned with viruses as pathogens, but with other properties useful in assays. Fulton's scholarly analysis of the complement fixation test would be equally, perhaps more, appropriate to a volume on serology. However, there was no need to justify its inclusion for such questionable reasons as that viruses can rarely be obtained concentrated enough to use other serological methods and that virus workers are prejudiced against complement fixation. The precipitin test is used successfully with many viruses, and complement fixation is mentioned too often in the first two articles in this volume to suggest any strong prejudice against it. A third reason he offers is that "the complement test is both easier and more specific than hemagglutination techniques", the subject of the last article. Fulton says "Hemagglutination is bedevilled by non-specific inhibitors, and is a much more sophisticated technique than it first appears". In this, Buzzell and Hanig seem to agree, for they say "the ostensible simplicity of the hemagglutination reaction is, in reality, confused by a mass of diverse, and often contradictory evidence. Any mechanism which might be proposed to explain these divergences must be exceedingly flexible and endowed with so many parameters that it may be expected to explain anything". A cynic might be tempted to add that this is also true of mechanisms proposed for some other phenomena described in this volume.

Probably few virus workers will read all these articles with interest, but even fewer will find nothing of interest. The authors deserve credit for discussing their subjects critically and not simply summarizing all published work. It is less praiseworthy that reading is often unnecessarily tedious because some have rarely used one word when they could employ three.

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CHEMISTRY OF THE STEROIDS

Chemistry of the Steroids

By Prof. Charles W. Shoppee. (Organic Chemistry Monographs.) Pp. vii+314. (London: Butterworths Scientific Publications; New York: Academic Press, Inc., 1958.) 50*s*.; 9 dollars.

FROM the author's preface it would appear that this volume has been written with the object of providing both a concise account of our present knowledge of the chemistry of the steroids and a more complete one of recent work, particularly when this has appeared since existing treatises on the subject were compiled. It is thus apparently intended to serve the dual purpose of a text-book and a work of reference. In the latter capacity it will prove invaluable, for it summarizes most of, if not all, the reactions which the individual steroids undergo and is liberally provided with references to the original sources. As a text-book it also contains many valuable features. It is useful to have collected together in one volume the principal data on which the accepted structures, conformations and configurations of the individual steroids are based; it is advantageous to possess brief summaries, translated in terms of present-day notation, of the fundamental contributions made by Windaus and Wieland to our knowledge of the structures of the sterols and bile acids; and it is convenient to have available outlines of the methods by which so many partial or total syntheses of important steroids have been effected. But its value as a text-book is somewhat diminished by the interspersing throughout the text of long passages—no doubt necessary in its capacity as a reference book—which consist of catalogues of chemical reactions. These make monotonous reading and destroy the continuity of the subject-matter.

As the title indicates, the book deals solely with the chemistry of the steroids. Nevertheless, brief statements of the functions or physiological activities of the individual compounds or groups are, when known, necessarily made. The subject-matter has been clearly and, so far as I can ascertain, accurately presented. Attention may, however, be directed to the following minor points:

The statement in the introductory chapter that the steroids are, "for the most part, saturated natural products . . ." appears to be misleading. For, while it is true that the bile acids follow this 'rule', the sterols, steroid hormones and other steroids do not.

In the chapter describing the sterols, each individual sterol is described in a separate section. Copro-