

a chapter discussing the future possibilities for mapping more fully the agricultural information which has been, and is, accumulating in such quantity throughout England and Wales.

There are three appendixes and a select bibliography. The first appendix provides additional information about sources and the construction of individual maps. The second, contributed by A. Sentance, of Birkbeck College, London, is a technical description of the processing of data for the *Atlas* by computer. The third contains details of the various crop, livestock and enterprise combinations, and some selected statistics. The bibliography is restricted to publications of direct relevance to the contents of the *Atlas*, and is helpfully classified by reference to the various chapters.

J. L. BEVERIDGE

MILESTONES IN VIROLOGY

Selected Papers on Virology

Edited by Nicholas Hahon. Pp. xv + 363. (Englewood Cliffs, New Jersey, and London: Prentice-Hall, Inc., 1964.) 60s.

AN alternative title to this book might be "The Birth of a Science"; virology, that ugly word of doubtful parentage, is now a dynamic biological discipline.

For his compilation, Dr. Hahon has selected forty papers, spanning nearly two centuries, beginning with the paper by Edward Jenner on cowpox in 1789, and ending with the recent work of Trentin, Yabe and Taylor on the quest for human cancer viruses published in 1962.

It is difficult to make a representative selection of only forty papers out of such an immense field; but the author has carried out his invidious task with care and perspicacity. Whatever his choice, it is inevitable that some criticism of it would be made. One feels that Iwanowski deserves more than casual mention, for it was he who first proved the existence of the 'ultramicroscopic filterable viruses', to use a phrase now long obsolete, by showing that the agent causing tobacco mosaic was still infectious after passage of a Pasteur-Chamberland filter candle. F. C. Bawden and N. W. Pirie also deserve a niche in this hall of fame, since it was they who showed that the virus of tobacco mosaic, isolated by Stanley in 1935, was a nucleo-protein.

The time has long gone by when it could be stated that "plant viruses are of an entirely different nature from that of the animal viruses". We should recognize now that there are not four different kinds of infectious agents, each in its watertight compartments of bacterial, plant, insect and animal hosts. The science of virology comprises the study of viruses, no matter from what type of host they are derived. Once freed from the host cell, the similarity between some viruses of completely different origin is remarkable, and who would be bold enough to say at a glance whether a small near-spherical virus, when viewed in the electron microscope, was that of poliomyelitis or turnip yellow mosaic?

The boundaries which separated these four types of viruses are indeed becoming indistinct and doubtful, and the versatility of viruses and their ability to adapt to different hosts are increasingly alarming. Certain plant viruses can multiply in their insect vectors; the virus of swine influenza, which is thought to be a relic of the great influenza pandemic of 1918-19, can multiply in a parasitic lung worm as well as in the pig, and a plant virus causing 'wound tumours' in legumes is thought to have a serological relationship with one of the reoviruses pathogenic to man.

The final paper in this book deals with an absorbing aspect of virology, the viral causation of tumours and the possible relationship of viruses with human cancer. It shows that a virus from man, one of the adenoviruses,

has oncogenic properties and produces tumours when injected into new-born hamsters. Again, who would have predicted that the Rous sarcoma virus, originally only transmissible between certain strains of chickens, is now apparently capable of producing tumours in Primates?

By compiling this book, Dr. Hahon has rendered a great service to virology. He has brought within easy reach many early papers, often difficult to obtain, and, in the increasing *tempo* of virus research, has emphasized the discoveries of major importance.

K. M. SMITH

DRUGS AGAINST VIRUSES

The Background to Chemotherapy of Virus Diseases

By Prof. C. H. Stuart-Harris and Dr. Lois Dickinson. (A Monograph in the Bannerstone Division of American Lectures in Living Chemistry.) Pp. xi + 175. (Springfield, Ill.: Charles C. Thomas, 1964.) 10.50 dollars.

THERE is a feeling in the air that after many years of frustrated hopes we may be about to get somewhere in the field of chemotherapy for viruses. We have learnt so much more recently about the chemistry of viruses and how they multiply that it is now possible to approach the subject in a logical way: no need any more to take bottles off the shelf in alphabetical order and test them in a hit-or-miss manner.

This little book is by the professor of medicine in the University of Sheffield and a senior worker at the Research Department of Boots Pure Drug Co., Ltd., in Nottingham. Between the two, they well know the difficulties of the subject both from the clinical and laboratory angles. The background of the subject is presented in the first three chapters on the chemical composition and multiplication of viruses, their pathology and on the phenomena of virus interference and interferon. The matter is briefly presented in an interesting and up-to-date manner, but does not contain anything much that is not covered in similar accounts in recent text-books and reviews. Chapter 4 gets down to the subject proper, describing recent experimental work in the field, with results obtained in tissue culture, in infected eggs and in laboratory animals. Formulae of the more important groups of compounds are given and the rationale of their use is discussed. Chapter 5 contains a particularly useful account of the criteria necessary to establish that a drug is of value in a human infection. I myself feel that rather more prominence might have been given to the very encouraging results of using a thiosemicarbazone compound for prophylaxis of variola in Madras. In Chapter 6 the authors deal with the rickettsiae and the psittacosis-lymphogranuloma-trachoma (P-L-T) group. They write that "the taxonomic position of the rickettsiae and, to an even greater extent, of the P-L-T group of organisms is still controversial". This is scarcely true any longer: it is almost universally agreed that these are bacteria rather than viruses. The authors contrast them with "the true viruses", but occasionally talk of them as if they really were viruses. Their inclusion in this book is understandable, since it is only against them that chemotherapy has proved its worth: knowledge about this may prove of value in describing a 'background'; it at least shows that we need not despair of tackling an obligate intracellular parasite. A final chapter deals with antibacterial chemotherapy, the action of steroids, and the use of serum as additional aids in the fight against viruses.

Despite our hopes for the future, present achievements in the field of virus chemotherapy are admittedly very meagre. This book simply tells of present difficulties and will serve, one hopes, to consolidate a jumping-off ground for future advance. But for less than 120 pages of straight text, a price of 10.50 dollars is indeed fierce.

C. H. ANDREWES