Virology after 14 Years of Discovery

General Virology. S. E. LURIA and JAMES E. DARNELL, JR. Wiley, New York, ed. 2, 1967, 528 pp., illus. $12.50.

The first edition of this book appeared in 1953, a momentous year for biology. For in 1953 was published the revolutionary paper of Watson and Crick in which they elucidated the structure of DNA and simultaneously proposed a mechanism for its replication. That paper, a cornerstone of modern molecular biology, not only offered insight into the mechanism of DNA replication but also introduced a new intellectual frame of reference to the scientific community. It was fortunate that *General Virology* appeared just before this revolution. Because at that time little information was available on the molecular biology of viruses Luria was forced to concentrate on the *biology* of viruses, and the result was a masterly survey of the phenomenology of virology. *General Virology* proved to be a source of stimulation and inspiration for a whole generation of old and new virologists, and the first edition still has much to recommend it.

The second edition will not replace the first but will rather supplement it, for most of the research in virology since 1953 has been of a different character. In 1953 there was a firm foundation of techniques of bacteriophage research which made these viruses the ideal models for later studies on the replication and transcription of DNA. Inevitably, many of the studies on the molecular mechanism of DNA replication were accomplished by using the T-even series of bacteriophage. But many important developments in the study of all types of viruses were reported around this time. In 1952 Dulbecco developed techniques for the quantitative study of animal viruses which permitted the same type of analysis which was being used so successfully by the bacteriophage workers. The demonstration of DNA as the genetic material of bacteriophage by Hershey and Chase in 1952, of RNA as the genetic material of tobacco mosaic virus by Gierer and Schramm in 1956, and the induction of mutations in tobacco mosaic virus by treatment with nitrous acid by Mundry and Gierer in 1958 must be considered among the monumental achievements which led to a continuing expansion of research and knowledge in virology. These overwhelming advances are reported here as they are in no other single source presently available.

Since the second edition has only 81 more text pages than the first, it is obvious that presentation of the massive amount of knowledge accumulated since 1953 has been accomplished by elimination of large portions of the original text. There has also been considerable rearrangement of material, with subjects to which chapters were originally devoted now occupying only a few pages or paragraphs. In carrying out this revision the authors have emphasized the molecular and biochemical aspects of virology, but fortunately the broad biological viewpoint has not been lost.

This book should appeal to two audiences, the beginning students of virology and the experienced workers in the field. But I recommend the book to beginning students with the reservation that it be used only in conjunction with a formal course and not for independent study. I shall cite two examples to illustrate the need for guidance. (i) The description of the formal genetics of bacteriophage is not very clearly presented. Granted it is a difficult subject, but for a textbook approach the more lucid qualitative description of Hayes [*The Genetics of Bacteria and Their Viruses* (Wiley, 1964)] is preferable to a semi-quantitative approach with a smattering of underived equations. (ii) The analogy between virus-transformed tumor cells and lysogenic bacteria is emphasized in the chapter on tumor viruses. Although at least part of the genome of some DNA tumor viruses may be integrated into transformed cells, there is no evidence that this occurs in the case of the RNA tumor viruses. We read, nevertheless, the following: "In summary, the findings on two major groups of tumor viruses contribute to a consistent picture that forms a useful model on which further work can be based. According to this still unproven model, viral nucleic acid integrates with the host genome and specifies one or more proteins that enter the cell membrane, causing loss of contact inhibition." Even at the time of publication, this concept was in disrepute for the RNA tumor viruses, and recent experiments have made it unlikely that the lysogenic model has any relevance for this group. I refer here to the demonstration of infectious Rous sarcoma virus particles in "nonproducer" cells. Emphasis on the lysogenic concept in relation to all tumor virus would have been avoided if this most recent information had been available; this brings up the inevitable datedness of a book in a field still expanding with breathtaking rapidity.

Because of its broad perspective the mature virologist can also profit from this book, which can counteract the narrow vision necessary for examining single shards rather than the finished pot in one's search for truth. It also can be recommended, albeit with the reservations applicable to students, as an excellent introduction to virology for research workers in more distant fields.

On balance, the authors have achieved a remarkable synthesis of the state of our knowledge of virology as of mid-1966. No comparable book is available at present.

RICHARD M. FRANKLIN
Public Health Research Institute of the City of New York, Inc., New York 10009

Review of Protozoa

Research in Protozoology. Vol. 1. TZE-TUAN CHEN, Ed. Pergamon, New York, 1967. 436 pp., illus. $17.

My goals for books of this type are (i) currency, (ii) authority, (iii) quality of individual presentations, (iv) synthesis but not a cataloging of the literature, and (v) editorial excellence. Few volumes satisfy all of these, and this book is no exception, especially with respect to (iii) and (v).

There are five contributions in this volume. E. Anderson's presentation of organelles and inclusions is less than satisfactory on all the above counts. It is especially marred by rather extensive misspellings or transpositions, all of which should have been spotted by an eagle-eyed editor. This chapter is merely a catalog and an album of photographs (all excellent) of items found in many texts. On the other hand, the contribution of T. L. Jahn and E. C. Bovee meets all my criteria, with the bonus that their chapter illustrates the utility of excellent line