book *Hereditary Genius*, published in 1869. The modern science of behavior genetics, though, can be dated from the 1960 publication of *Behavior Genetics* by John Fuller and W. Robert Thompson. Now, some two dozen years later, this apparently fertile hybrid between genetics and psychology has fostered its own journal, professional association, textbooks, and collections of papers. (For two seminal examples, see J. Hirsch, Ed., *Behavior-Genetic Analysis*, McGraw-Hill, 1967, and M. Manosevitz, G. Lindzey, and D. Thiessen, Eds., *Behavioral Genetics: Method and Research*, Appleton-Century-Crofts, 1969.) Like all hybrid sciences, this one must pass between the Scylla of triviality and the Charybdis of confusion, avoiding both the platitude that all behavior is under some kind of genetic control and the abortive attempt at unraveling genetic and environmental influences with inadequate conceptual and experimental tools.

The present collection seeks to present an overview of contemporary research in European laboratories. The articles range from discussions of the mathematical tools of genetic analysis, through review articles covering broad reaches of the discipline, to narrowly focused research reports of individual investigators. In each category there are worthwhile articles. Two articles by Jinks and Broadhurst give a solid exposition of the use of mathematical analysis to determine broad and narrow heritability and the number of genes involved in producing a particular trait. However, expositions of these same ideas by the same authors are available elsewhere. Fulker's review of the application of these techniques to human genetics is sound but, like many of the chapters, draws more heavily on earlier literature than seems warranted in view of current research activity. Burnet and Connolly's review of the genetics of sexual behavior in *Drosophila melanogaster* is authoritative and current. The research reports by Lagerspetz and Lagerspetz, by van Abeelen, and by Busser, Zweep, Deol, and van Oortmerssen provide an interesting cross section of rodent behavior genetics from the anatomical-physiological to the ecological level.

As a collection, however, the work suffers from being dated, provincial, and lacking in clear direction. Important American work emphasizing the use of genetic tools to analyze development, such as that of Seymour Benzer or of workers at the world's only Institute of Behaviorial Genetics (in Boulder, Colorado), is overlooked entirely or mentioned only in passing. And, since there is no author index, even the passing references are buried. The division of the material into two sections, the first lumping biometrics with evolutionary aspects and the second supposedly treating phenogenetic and regulatory aspects, seems arbitrary and misleading.

Although the volume does contain some useful material, it seems altogether too flawed to justify the high price for any but the most complete library or specialist collections.

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Compendium on Viruses

Comprehensive Virology. HEINZ FRAENKEL-CONRAT and ROBERT R. WAGNER, Eds. Vol. 1, Descriptive Catalogue of Viruses. 1974. xii, 190 pp., illus. $12.50. Vol. 2, Reproduction: Small and Intermediate RNA Viruses. 1974. xiv, 340 pp., illus. $28. Vol. 3, Reproduction: DNA Animal Viruses. 1974. xiv, 488 pp., illus. $32.50. Vol. 4, Reproduction: Large RNA Viruses. 1975. xii, 348 pp., illus. $29.50. Plenum, New York.

The coming of age of virology as an independent discipline may be marked by the appearance of the first volume of the journal *Virology* in 1955. Since then the discipline has grown spectacularly, as is evidenced by the increase in the number of journals (in English) devoted to virus research, particularly to molecular virology. The information explosion in the field has prompted Fraenkel-Conrat and Wagner to initiate this series in which they "hope to place the entire field in perspective as well as to develop an invaluable reference and sourcebook for researchers and students at all levels." Four volumes have been published and many more are promised.

The first volume, "Descriptive Catalogue of Viruses," compiled by Fraenkel-Conrat, is in the form of a dictionary and lists the viruses alphabetically. It is divided into three parts: Viruses of Vertebrates and Insects; Plant Viruses; and Viruses of Protists. Each virus (or group of viruses) is defined in terms of its physical-chemical and biological properties (if these are known), with emphasis on the former. Data on the amino acid composition of virus proteins and their sequences, as well as the nucleotide sequences of nucleic acids, are provided in tables and figures. There are also a few electron micrographs of representative viruses.

The alphabetical listing of viruses has a certain utility, but as an introduction to such a series a general classification showing the relationship of one virus to another would have been preferable. The provision of such information has been left to the individual contributors, not all of whom have elected to provide it. Moreover, there are some errors in the catalog—for example, it is incorrect that pseudorabies virus DNA occurs as two components. Finally, the reproduction of the electron micrographs in this as in the other volumes of the series would have been enhanced by the use of glossy paper.

The second volume, subtitled "Reproduction: Small and Intermediate RNA Viruses," begins with a chapter by L. Eoyang and J. T. August on RNA bacteriophages. The authors present a collection of loosely organized facts and references with little interpretation or analysis. This chapter should have set the stage for the following chapters, but it fails to do so, and one must wait until the excellent article on picornaviruses by L. Levintow to find a reasonable discussion and a few diagrams of models for the replication of single-stranded RNA genomes. The shortcomings of the chapter are illustrated by the failure of the authors to indicate the time course of the virus growth cycle to introduce their discussion of transcription and translation.

Little of a definitive nature is known about the details of reproduction of plant viruses. However, one unique aspect of plant viruses is the presence of multiple RNA molecules packaged in different particles, and A. Siegel and V. Hariharasubramanian, the authors of chapter 2, on small plant RNA viruses, wisely concentrate on this aspect. They also point out the significant aspects of plant viruses on which research is under way or is needed.

Levintow (chapter 3) has been most successful in striking the proper balance between an "Annual Reviews" style and a more extensive analysis of the data that would be suitable for a beginning virology student. He stresses the unity rather than the diversity of picornaviruses. It is not as easy to apply the same kind of analysis to the togaviruses, discussed in the following chapter, since the two types, A and B, differ significantly in a number of properties. Nevertheless, R. Pfefferkorn and D. Shapiro deal quite adequately with these differences at each step.

The last chapter in this volume, by W. K. Joklik, reviews the literature on the reproduction of reoviridiae. This is a lucid account of an interesting group of viruses by one of the leaders in the field. The author does not hesitate to speculate, and his critical evaluations make for interesting reading.

The third volume, which deals with the reproduction of DNA animal viruses, is opened by a description by J. A. Rose of parvovirus reproduction, a straightforward account of the smallest known DNA-containing vertebrate viruses by a leader in a recently developed field.

The next two chapters, on papovaviruses by N. P. Salzman and G. Khoury and on adenoviruses by L. Philipson and U. Lindberg, are well written and well illustrated. The authors cover most of the latest information and provide their own speculations and interpretations.

The following chapter on the herpesviruses by B. Roizman and D. Furlong is more than twice as long as any other chapter in the volume. It is primarily a detailed review (with 47 figures and 11 tables) of the work performed in the authors' laboratory. Other, equally interesting aspects of the replication of the herpesviruses are either completely neglected or treated in a cursory manner, with a number of errors. The last chapter in volume 3 is an interesting account by B. Moss of recent work on the poxviruses. The author presents a nicely illustrated summary of most aspects of the interaction of the poxviruses with their host cells.

The fourth volume considers the reproduction of large RNA viruses. The first chapter, by R. R. Wagner on the rhabdoviruses, is a lucid and comprehensive account of this important group. The chapters on the myxoviruses by P. W. Choppin and R. W. Compans are also well written and informative. They contain an excellent account of the physical-chemical properties of these viruses and cover many of the biological and biochemical properties quite well. J. Bader's chapter on the RNA tumor viruses puts in perspective the information available up to 1973. Though already out of date, it is worth reading if only for the number of controversial issues discussed and hypotheses proposed to explain the replication of these viruses.

In general, this series suffers from unevenness in quality and might have been edited more carefully. (There is an unusual number of typographical errors.) The coverage is certainly not "comprehensive"—pathological and immunological aspects of virology are omitted, and many of the authors refer the reader to reviews in areas of virology not covered in these volumes. Some of the chapters are rather complete, whereas others are already out of date. For example, intensive research on the picornaviruses occurred during the '60's and consequently most of the important information about these viruses could be included in the book. By contrast, the chapter on the replication of RNA tumor viruses is dated because research on the subject is currently progressing rapidly. Despite its shortcomings, however, this series will be useful to those interested in becoming acquainted with the field of virology, as well as to virus research workers and teachers. Students will probably gain the most from the series. It is a pity, therefore, that the price of the volumes is so high.

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