

wealth of experimental observations on human physiology have been made available by modern techniques. Incomplete and inadequate use is made of this information in this text, and one must be cautious in applying the author's statements to clinical surgery. Anesthetists and thoracic surgeons would take exception to the statement that artificial respiration is not needed in thoracotomy on human beings unless both chests are entered, or that some cyanosis is probably better than the alkalosis that comes with overventilation. There are several uncritical statements such as the suggestion that blood transfusions can be given subcutaneously, although admittedly better intravenously, and that large volumes of plasma can be given in blood replacement. Certainly the occasion for using plasma with unburned experimental animals must be rather uncommon. A misconception is given by the statement that "the damaged gallbladder weeps cholesterol" in connection with the formation of gallstones.

Although these are only a few of the exceptions I would take to statements in the book, I believe the advantages more than adequately compensate for some inaccuracies and that the book will be helpful to the host of physicians working in experimental surgery today.

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The Viruses. Biochemical, biological, and biophysical properties. vol. 3, *Animal Viruses*. F. M. Burnet and W. M. Stanley, Eds. Academic Press, New York, 1959, xvii + 428 pp. Illus. \$12.

This third volume continues the basic pattern of the series [*Science* **130**, 657, 724 (1960)]; the 13 chapters deal almost entirely with topics that cut across taxonomic lines within the large group of animal viruses. It is difficult to make a general characterization of the discussions, which were written by 11 different authors, but there is a common denominator in their primary concern with viral activity at the cellular level.

The volume begins with an introductory chapter by Burnet in which the main groups of animal viruses are presented and the status of their taxonomy

is discussed. The following seven chapters deal with various aspects of virus-host cell interactions, and the first five of these are arranged in a logical order related to the sequence of entrance of a virus into a cell, the activities associated with intracellular virus, and the release of virus from the cell. Because of our ignorance concerning the first and third of these stages, in the case of animal viruses, the bulk of what can be said concerns the second stage. Thus, Burnet uses a relatively few pages for a discussion of the initiation of infection by animal viruses, although the mechanism of viral attachment to erythrocytes, leading to hemagglutination, may well be a closely related phenomenon and is properly inserted at this point in two chapters, "Hemagglutination by animal viruses," by Anderson, and "Chemistry of virus receptors," by Gottschalk. Studies on viruses within cells are described by Bang in "The morphologic approach," and by Isaacs in "Biological aspects of intracellular growth." The latter includes a section on the release of virus from infected cells. Important areas of virus-host cell relation are covered in Schlesinger's discussion "Interference between animal viruses," and in Horsfall's treatment "Inhibitors of multiplication."

The next three chapters deal with genetic problems. "Variation in virulence in relation to adaptation to new hosts," by Fenner and Cairns, extends the approach from the cellular level to consideration of more complex systems (tissue culture, embryonic membranes) and eventually to pathogenesis of viral infections in the whole animal. One wishes that more space had been given in this chapter or elsewhere to the topic of latency or "carrier state" of virus-infected animal cells. This represents the only major omission that I detected. In "Serologic variation," by Francis, studies on the influenza viruses are reviewed, and practical implications of their genetic changes are made apparent. Burnet's "Genetic interactions between animal viruses" analyzes the methods and results of recombination and related phenomena.

The final chapters deal with groups of viruses that are not yet readily amenable to discussion under the topics listed above. These are "Problems concerning the tumor viruses," by Andervont, and "The insect viruses," by Smith. Andervont describes the properties of representative tumor viruses as a basis for presenting the current status of the active field of virus-tumor

investigation. Smith's chapter represents a general review of the insect viruses; it is apparent that significant similarities and differences between these viruses and the other large groups have not yet been defined except at the level of their chemical and physical nature.

There is a subject index, and an index of references by authors. Illustrations are confined to the chapters by Bang and Smith.

This work is outstanding in its presentation of animal virology primarily from an academic viewpoint. Viruses are approached as biologic entities, not as culprits in public health problems. The study of viruses has moved out of the descriptive phase of its development, and the three volumes of this series, in addition to providing a valuable source of expert information, represent an important stone in the building of an integrated science of virology.

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Reprints

Derivatives and Differentials, Definite Integrals, Expansion in Series, Applications to Geometry. Edouard Goursat. Translated by Earle Raymond Hedrick. Dover, New York, 1959 (unabridged republication of the Hedrick translation). 556 pp. Paper, \$2.25.

Differential Equations. Edouard Goursat. Translated by Earle Raymond Hedrick and Otto Dunkel. Dover, New York, 1959 (unabridged republication of 1917 edition). 308 pp. Paper, \$1.65.

From Magic to Science. Essays on the scientific twilight. Charles Singer. Dover, New York, 1958 (reprint). 284 pp. Paper, \$2.

Functions of a Complex Variable. Edouard Goursat. Translated by Earle Raymond Hedrick and Otto Dunkel. Dover, New York, 1959 (unabridged republication of 1916 edition). 269 pp. Paper, \$1.65.

Functions of a Complex Variable. James Pierpont. Dover, New York, 1959 (reprint of ed. 1, 1914). 597 pp. Paper, \$2.45.

Lectures on the Theory of Functions of Real Variables. vols. 1 and 2. James Pierpont. Dover, New York, 1959 (unabridged republication). Paper, \$2.45 each.

De Magnete. William Gilbert. Translated by P. Fleury Mottelay. Dover, New York, 1958 (unabridged republication of 1893 translation). 419 pp. Paper, \$2.

A Source Book in Mathematics. vols. 1 and 2. David Eugene Smith. Dover, New York, 1959 (unabridged republication of 1929 edition, original edition published in one volume). 701 pp. \$1.85 each.