limitations of, and the demands made by, the computer. Both the individual and his discipline will benefit from such an understanding.

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Serological Research Methods

The practical and theoretical discipline of immunology and immunochemistry has developed at a bewildering rate, and all fields of biological and medical research are being influenced by the advances. As a result, many rigorous and sophisticated serological methods have been introduced in recent years, and several general guides to such methods, their applications and limitations, have hit the stands in the last five years. Of the four guides that come to mind the authors or editors have wisely recognized their limitations and have confined their efforts to tasks of less monumental scope than has J. B. Kwapinski, the author of this book.

Basically, **Methods of Serological Research** (Wiley, New York, 1966. 541 pp., $18.50) is a review of the literature. There are more than 2200 bibliographic references (less than 10 percent are more recent than 1960; nearly 20 percent are pre-1940) servicing about 400 pages of text and 350 "methods." There are several tables illustrating protocols, flow-sheets for bacterial fractionation, or summarizing the bibliography on a particular subject. There are no figures, however, even to illustrate visual methods such as hemagglutination, flocculation, and diffusion reactions in gels, or to demonstrate the plotting and analyzing of data derived from quantitative techniques.

The descriptions of procedures are sometimes adequate to follow as given but these satisfactory descriptions are rare and deal primarily with the author's own methods or with those that are obviously familiar to him. Understandably, these are concerned largely with methods in microbial serology toward which the book is heavily weighted. Other descriptions may be presented in principle only or with greatly telescoped and sometimes cryptic stepwise directions. Often a method, considered by many to be important in immunological research, is only mentioned. Some have escaped any treatment even when the general topic has been assigned one of the 17 chapters. An example is the barest allusion to equilibrium dialysis as "a useful method," giving a 1932 reference.

Omissions, however, are an author's prerogative; indeed, Kwapinski would have done well to omit a hundred or so other methods if that would have permitted him to treat in more detail some methods which are still in use or which have been fully developed more recently. Another serious risk in condensing methodology is that incomplete scraps of data out of the research context are often meaningless or, even worse, misleading. This context is frequently lacking even in those sections that are otherwise well presented. The bibliographic references intended to provide the context and guide to applications were apparently selected with more homage to chronological priority than to useful technical content. This, in turn, has introduced some serious omissions—and some glaring errors even in the author's text.

The amount of work that has gone into this book should not go unnoticed, however, and in spite of the foregoing it has its indisputable virtues. As a comprehensive guide to the early literature it excels; and it does provide an almost complete list of serological reactions.

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New Books

Biological and Medical Sciences

Ability Structure and Subgroups in Mental Retardation. Johs. Clausen. Spartan Books, Washington, D.C., 1966. 216 pp. Illus. $10.

Advances in Botanical Research. vol. 2. R. D. Preston, Ed. Academic Press, New York, 1965. 394 pp. Illus. $12. Six papers: "Some phyletic implications of flagellar structure in plants" by I. Manton; "Fundamental problems in numerical taxonomy" by W. T. Williams and M. B. Dale; "Ultrastructure of the wall in growing cells and its relation to the direction of the growth" by P. A. Roelofsen; "The protein component of primary cell walls" by Derek T. A. Lamport; "Embryology in relation to physiology and genetics" by P. Maheshwari and N. S. Rangaswamy; and "The soft rot fungi: Their mode of action and significance in the degradation of wood" by John Levy.

Advances in Carbohydrate Chemistry. vol. 20. Melville L. Wolfrom, Ed. Academic Press, New York, 1965. 565 pp. Illus. $18.50. Nine papers: "Chemical and physical studies of cyclitols containing four or five hydroxyl groups" by G. E. McCasland; "Unsaturated sugars" by R. J. Ferrier; "Chemistry of osazones" by Hassan El Khadem; "Sulfates of the simple sugars" by J. R. Turvey; "Cyclic acetals of the aldoses and aldosides" by A. N. de Belder; "Reactions of amino sugars with *beta*-dicarbonyl compounds" by F. García González and A. Gómez Sánchez; "Naturally occurring *C*-glycosyl compounds" by L. J. Haynes; "Phenol-carbohydrate derivatives in higher plants" by J. B. Pridham; and "Wood hemicelluloses: part II" by T. E. Timell.

Advances in Heterocyclic Chemistry. vol. 5. A. R. Katritzky, Ed. Academic Press, New York, 1965. 411 pp. Illus. $16. Six papers: "Electronic structure of heterocyclic sulfur compounds" by R. Zahradník; "Theoretical studies of physico-chemical properties and reactivity of azines" by R. Zahradník and J. Koutecky; "1,2,4-thiadiazoles" by Frederick Kurzer; "The aminochromes" by R. A. Heacock; "Aromatic quinolizines" by B. S. Thyagarajan; and "Advances in pyrrolizidine chemistry" by N. K. Kochetkov and A. M. Likhosherstov.

Advances in Marine Biology. vol. 3. Sir Frederick S. Russell, Ed. Academic Press, New York, 1965. 412 pp. Illus. $13.50. Four papers: "Learning by marine invertebrates" by M. J. Wells; "Effects of heated effluents upon marine and estuarine organisms" by E. Naylor; "Aspects of the biology of the seaweeds of economic importance" by A. D. Boney; and "Marine toxins and venomous and poisonous marine animals" by Findlay E. Russell.

Atlas of Developmental Anatomy of the Face. Bertram S. Kraus, Hironori Kitamura, and Ralph A. Latham. Harper and Row, New York, 1966. 392 pp. Illus. $20.

Basic Arthropodan Stock: With Special Reference to Insects. A. G. Sharov. Pergamon, New York, 1966. 283 pp. Illus. $12.50. International Series of Monographs in Pure and Applied Biology.

The Biochemistry of Animal Development. vol. 1, *Descriptive Biochemistry of Animal Development*. Rudolf Weber, Ed. Academic Press, New York, 1965. 662 pp. Illus. $23. Nine papers: "Chemical constitution and metabolic activities of animal eggs" by J. Williams; "Biochemical aspects of fertilization" by Alberto Monroy; "Morphogenetic significance of biochemical patterns in sea urchin embryos" by Tryggve Gustafson; "Morphogenetic significance of biochemical patterns in mosaic embryos" by J. R. Collier; "Biochemical patterns in early developmental stages of vertebrates" by E. M. Deuchar; "Enzyme development in relation to functional differentiation" by Florence Moog; "Development of nonenzymatic proteins in relation to functional differentiation" by J. B. Solomon; "Biochemical mechanism of information transfer" by Matthys Staehelin; "Informational molecules and embryonic development" by Philip Grant; and an introduction on "The history of chemical embryology" by J. Brachet.

Control of Macromolecular Synthesis: A Study of DNA, RNA, and Protein Synthesis in Bacteria. Ole Maaløe and Niels Ole Kjeldgaard. Benjamin, New York, 1966. 296 pp. Illus. $12.50. Microbial and Molecular Biology Series, edited by Bernard D. Davis.