

Malariology

Experimental Malaria. A panel workshop, Washington, D.C., May 1969. ELVIO H. SADUN and ARTHUR P. MOON, Eds. Association of Military Surgeons of the United States, Chevy Chase, Md., 1969. Illus. Paper, \$4. Military Medicine, Vol. 134, No. 10, pp. 729-1306 (Sept. 1969).

This volume is a presentation of a workshop held at the Walter Reed Army Institute of Research. The contributors are some 60 scientists who are conducting research into various aspects of malaria with the support of the U.S. Army Medical Research and Development Command. Similar contributions, organized along the same lines, appeared in January 1964 and September 1966. All have had the same purpose: to organize, review, and summarize the diverse approaches to research in malaria that are being exploited during this decade.

One of the primary objectives in presenting this volume was to provide a reference manual for basic research on malaria. This objective has been realized quite successfully. In addition to the new information presented in the articles, the authors have provided detailed bibliographies that organize some of the vast literature of malaria into categories of interest to specialists, as well as to workers in the general field of parasitology.

There are six major subdivisions of the book, apart from the introduction and recapitulation. Under Experimental Infections, the five papers dealing with the adaptation of human malarial parasites to subhuman primates suggest lines of investigation of very basic interest to students of host-parasite relationships, and it can be hoped that further studies of the nature of the adaptation process in vertebrate and vector will be undertaken without a shift of emphasis toward the obvious application of these findings to the testing of chemotherapeutic compounds, vital though these may be. In this section and two others, Cultivation of Plasmodia and Biochemistry and Physiology, painstaking investigations into the biochemical activities, components, and requirements of malarial parasites are covered in some detail. There is throughout these sections an attempt to integrate studies on fine structure, biochemistry, and host reaction. The sections Immunization, Immunopathology, and Serology reflect the growing interest in the possibility of immunization against malaria, in

developing accurate and simplified diagnostic techniques, and in broadening our understanding of immune processes at increasingly sophisticated levels. With one notable exception, viewpoints expressed in the papers seem well founded; appropriate comments included at the end of the pertinent section waste little valuable space on this old controversy concerning the relationship of the parasite to the host cell.

The volume is reasonably well prepared: the tables and figures, including a color plate, are satisfactory to good in quality. In general, this collection of papers is an impressive contribution to malariology.

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The Clonal Selection Theory

Cellular Immunology. Books 1 and 2. MACFARLANE BURNET. Melbourne University Press, Carlton, Victoria, Australia; Cambridge University Press, New York, 1969. x + 728 pp. + plates. \$18.50.

Self and Not-Self (*Cellular Immunology*, Book 1). MACFARLANE BURNET. Melbourne University Press, Carlton, Victoria, Australia; Cambridge University Press, New York, 1969. viii + 320 pp. + plates. Cloth, \$8.50; paper, \$2.95.

In *Cellular Immunology* Macfarlane Burnet has given us two books, of 311 and 400 pages, respectively, with a combined index. Both books have the same purpose, to justify the clonal selection theory of acquired immunity. However, they are designed for different audiences: Book 1 is written "as an essay for readers interested, as biologists of one sort or another, in immunology but not necessarily concerned directly with immunological research." Book 2 is for the technically qualified immunologist, or for students and investigators entering the field. It offers "a more technical and documented justification."

Book 1 has also been published separately under the title *Self and Not-Self*. Regrettably no indication is given that Book 2 will also appear singly. I say "regrettably" because the combined package is wasteful. Very few readers will want both books. The occasional general reader who is stimulated by the paperback edition of *Self and Not-Self* might be reluctant to invest \$18.50 in the combination. More

knowledgeable readers, already versed in Burnet's arguments from some of his many earlier works, who may not need, or want, to read Book 1, may find Book 2 useful.

Too many parts of the two books are redundant. Moreover, although the author has tried to reach different audiences, the two books often sound too much alike. Book 1, for the non-specialist, is frequently as involved in its arguments as Book 2, lacking only the documentation of the latter.

Burnet's earlier book, *The Clonal Selection Theory of Acquired Immunity*, deservedly had a tremendous impact. To a considerable extent the present volume misses the mark, partly because its purpose, the justification of the clonal selection theory, is in itself redundant. The theory has been well supported, most notably in the pages of volume 32 (1967) of the Cold Spring Harbor Symposia, which provides ample justification for the idea and its originators, Burnet and Jerne.

Of the books in this combination, Book 2 may prove to be the more valuable, because it brings together ideas from many fields, as only Burnet can, and provides enough documentation for the immunologist to follow their convergence. It may be useful in charting future research.

Burnet has always been a creative and prolific writer, a constant source of ideas and inspiration. This idea—of combining two books in a single package—is not one of his better ones. Happily most of his more important ideas turn out more successfully.

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Sulfur and Its Compounds

Inorganic Sulphur Chemistry. G. NICKLESS, Ed. Elsevier, New York, 1968. xii + 770 pp., illus. \$52.50.

This is a very welcome book which compiles a great quantity of data on the reactions, stereochemistry, and structures of inorganic sulfur compounds. The strong point of the work is the enormous number of references cited; most of the 19 chapters list more than 200.

A number of fields are reviewed in depth. For example, a chapter on the structures of inorganic sulfur com-

pounds cites over 600 references and covers many classes of compounds. The discussion of the mechanisms of sulfur reactions by R. E. Davis is a unique presentation. Davis was a member of the group of students of Paul D. Bartlett which contributed so significantly to our understanding of the chemistry of elemental sulfur, and he quotes extensively from Harvard Ph.D. theses as well as from published material. The discussion of the analytical chemistry of sulfur ions will be very helpful, particularly since many of the references in this field are less well known than they should be. The chapter on the lower oxy-acids of sulfur also is a good review of this subject; thiosulfates are not covered, however. The discussion of the orbitals of sulfur and its compounds is worthwhile and original. R. J. Gillespie reviews the use of sulfuric acid as a solvent, and the late P. W. Schenk and R. Steudel cover sulfur oxides.

The authors in this work have done such a fine job in reviewing the topics they cover that I must confess great disappointment at finding several areas overlooked completely or badly neglected. For example, the discussion of structures of inorganic compounds omits x-ray data on organometallic complexes of sulfur ligands. Also, although many tables of bond angles are included, virtually no data on bond lengths are given. None of the chapters include summaries of bond dissociation energies. The radical reactions of sulfur compounds are almost totally ignored. Most strikingly, kinetics, photochemistry, and radiation chemistry are almost completely neglected.

Sulfur is a metalloid and is important in both inorganic and organic chemistry, and even in a book such as this one some organic chemistry should be covered. The editor has recognized this, and the chapter by Davis and one on the biological sulfur cycle review some of the organic chemistry and biochemistry of sulfur. The treatment is more condensed than I would have wished, and some topics which should have been covered are omitted. For example, the oxidation of xylenes to phthalic acids by elemental sulfur, a commercial process, is not mentioned.

In view of the wealth of bibliographic information, it seems an inexcusable oversight to omit an author index. In addition, the subject index is not as detailed as would be appropriate in this type of encyclopedic reference.

In other regards, the book is attractively designed. The tables and equations are laid out clearly and with few typographical errors.

In the preface, the editor comments that he and the late S. H. Pollard initiated work on this volume several years ago. The death of Pollard slowed the production of the book, and many of the chapters are not as up to date as I would have liked. Nevertheless, the volume is a success in most of what it attempts to do. It certainly should be purchased by every large university library and by all research institutes interested in the chemistry of sulfur. It will prove to be an indispensable compendium of references for the subjects which it covers in strength. The highly eclectic nature of the topics covered and the price undoubtedly will rule out its purchase by individuals. There appears to be a renaissance in the study of sulfur compounds and sulfur reactions, and this book is a welcome addition to the growing shelf of review volumes in the field.

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A New Mechanics

Phase-Space Dynamics of Particles. ALLAN J. LICHTENBERG. Wiley, New York, 1969. xvi + 336 pp., illus. \$16. Wiley Series in Plasma Physics.

The student of physics knows mechanics as a rather stodgy course in the standard curriculum, used mainly to screen academic sheep from goats. Little is left from its proud history as a model for physical theory, and indeed for all science. It has become seemingly useless, and a reasonable recounting of its triumphs requires presentation of methods currently thought too complex for the tender minds of students. While the classical subject of mechanics has thus been dying, a growing band of practitioners has, for nearly a generation now, been constructing a new mechanics. Like its sister subject, the new optics, this new discipline is an applied science, designed to serve other disciplines while retaining the elegance and precision that marked its predecessor. The basic motivation for this new development came from the demands of high energy physicists for ever more powerful, and therefore more costly, accelerators. With the risk of an ex-

pensive failure always close at hand, the study of beam dynamics in particle accelerators underwent a rapid growth. Somewhat later, the developing interest in plasma physics led to extensive further developments, with interactions between particles playing a more important role than in the accelerator problem.

This book is a competent presentation of the new mechanics, as applied in these two related areas. The unifying concept is that of the phase space of a dynamical system, here specialized in a very important and useful way. Any problem involving a beam or a plasma is in principle a many(N)-body problem which requires for its description a $6N$ -dimensional phase space. For the problems of interest in this book, the independence (or near independence) of the individual particles allows a description of the beam or plasma as a density of representative points in the reduced 6-dimensional phase space of one particle. This is an enormous simplification of the true problem, and gives excellent results under a wide range of conditions.

The development of the relevant concepts of Hamiltonian dynamics in the first three chapters is excellent and of general utility, and the last two chapters of applications successfully give the flavor of the new mechanics. Generally harmless misprints unfortunately abound.

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Books Received

Advances in Activation Analysis. Vol. 1. J. M. A. Lenihan and S. J. Thomson, Eds. Academic Press, New York, 1969. x + 224 pp., illus. \$9.50.

Advances in Cancer Research. Vol. 12. George Klein, Sidney Weinhouse, and Alexander Haddow, Eds. Academic Press, New York, 1969. xvi + 320 pp., illus. \$17.

Advances in Control Systems. Theory and Applications. Vol. 7. C. T. Leondes, Ed. Academic Press, New York, 1969. xiv + 314 pp., illus. \$16.

Albert Einstein. Sein Lebenswerk und die Zukunft der Physik. Pascual Jordan. Huber, Frauenfeld, Switzerland, 1969. 304 pp., illus. sFr. 24.80.

Aquatic Diptera. O. A. Johannsen. Part 5 by Lillian C. Thomsen. Entomological Reprint Specialists, East Lansing, Mich., 1969. Illus. \$11.25.

Chemical Bonding Clarified through

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