Protozoology

Biochemistry and Physiology of Protozoa. vol. 3. S. H. Hutner, Ed. Academic Press, New York, 1964. xvi + 616 pp. Illus. $18.50.

This long-awaited volume maintains the high standards set by its predecessors (vol. 1, 1951; vol. 2, 1955). S. H. Hutner, the editor, wisely chose those topics for which reviews were badly needed. The contributors have treated the topics in detail, but they have also included sufficient earlier work to permit the reader a comprehensive view of the field. Following a poignant introduction, by the editor, 13 topics are treated.

In their chapter "Environmentally induced growth oscillations in protozoa", O. H. Scherbaum and J. B. Loefer review the literature on the flagellates, sarcodinids, and ciliates. T. L. Jahn and E. C. Bovee, in "Protoplasmic movements and locomotion of protozoa," present critically the various theories of movement in amoebae, formaniferans, flagellates, and ciliates. It is unfortunate that lack of space prevented the inclusion of more micrographs, particularly of flagellates, in the excellent review, "The locomotor apparatus of ciliates and flagellates: Relations between structure and function" by Dorothy R. Pitelka and F. M. Child. "The nutrition and metabolism of ciliates," by G. G. Holz, is a splendid supplement to that in the previous volumes. In his review, "Physiological genetics of the ciliates," R. F. Kimball has combined ciliate genetics with cell physiology in a lucid manner. Per Halldal, in a chapter entitled "Phototaxis in protozoa" reviews this phenomenon in flagellates, amoebas, and ciliates. The unique properties of *Chlamydomonas* for genetic studies is described by Ruth Sager in her review, "Studies of cell heredity with *Chlamydomonas*." In his chapter entitled "The plastid pigments of flagellates," T. W. Goodwin concludes with a consideration of the relevance of pigment studies to the evolution of phytoflagellates. In "The biochemistry of acrasiales," Barbara E. Wright discusses the factors concerned with differentiation during various stages of the life cycle of slime molds. In the chapter entitled "The physiology of trichomonads," Mary S. Shorb covers the literature from 1950 through 1963, exclusive of that pertaining to morphology, classification, new hosts, new species, epidemiology, and chemotherapy. In the introduction to their chapter, "Nutrition and physiology of the Trypanosomatidae," Helene N. Guttman and F. G. Wallace provide a clarification of terminology, based on morphological evidence. L. G. Goodwin, in a chapter entitled "The chemotherapy of trypanosomiasis," covers the literature of the past 10 years. The rapid pace, during recent years, in work on antimalarials is reflected in I. M. Rollo's review, "The chemotherapy of malaria."

The editor and the contributors are to be congratulated for their thorough coverage of areas of research that are among those in the forefront of protozoan research today. No protozoologist, microbial biochemist, or physiologist can afford to be without this volume.

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Physics

La Thermodynamique de la particule isolée (ou **Thermodynamique cachée des particules**). Louis de Broglie. Gauthier-Villars, Paris, 1964. vi + 125 pp. Illus. Paper, $7.50.

This volume is based on the last course that the author taught before his retirement in 1962. The mathematical principles of classical and relativistic mechanics and of statistical thermodynamics are reviewed in brief and expert strokes. De Broglie then proceeds to coordinate these disciplines with each other. We are reminded that his thesis of 1924, which triggered the development of wave mechanics, dealt with the coordination of relativity and quantum theory.

About a third of the volume deals with speculative considerations, initiated primarily by the author and his collaborators, in which relativity, wave mechanics, and thermodynamics are used in concert to provide arguments in favor of a hypothetical "subquantic" medium and an appropriate reformulation of wave mechanics. In the early days of quantum mechanics one could invoke against this program that, in principle, the application of this discipline to atoms, molecules, solids and nuclei yields answers to all experimentally meaningful questions. The motivation for reformulation seems to stem only from the desire to make quantum mechanics conform to the classical ideal of a deterministic theory. I believe that the more recent developments of de Broglie's program can be motivated in a more satisfactory fashion. Although the principles of relativistic quantum mechanics are verified even in the high energy domain, they do not seem to be sufficient to answer all relevant questions. It is no longer out of place to search for additional principles, and a lower "subquantic" level might serve to reduce the proliferating elementary particles to some rational order. Some of the ideas advanced by the author may well be necessary for this purpose, but they are not likely to be sufficient.

This volume will be welcomed by those who like to be exposed to unconventional ideas and who appreciate imaginative but disciplined heuristic thought. The author is most candid in tracing the evolution of his conceptual universe and he discusses the merits of some alternative formulations already abandoned. The argument is mathematical, but elementary. Additional sources for reading are provided in a compact bibliography.

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New Books

General

Symbols, Signals, and Noise: The Nature and Process of Communication. J. R. Pierce. Harper and Row, New York, 1965 (reprint of the 1961 edition). 315 pp. Illus. Paper, $2.25.

Syntol. vol. 2. J. C. Gardin. Graduate School of Library Service, Rutgers State Univ., New Brunswick, N.J., 1965 (available from Rutgers Univ. Press, New Brunswick, N.J.). 106 pp. Illus. Paper, $3.50.

That Man May Survive. Alan Bateman and others. Institute on Man and Science, Rensselaerville, N.Y., 1965. 64 pp. Paper, 50¢. The contributors are Alan Bateman, Paul Brandwein, Charles Dambach, Loren Eiseley, Wade Ellis, Philip Handler, Ernest Pollard, Vincent Schaefer, Paul B. Sears, and Stewart L. Udall.

J. J. Thomson: And the Cavendish Laboratory in His Day. George Paget Thomson. Doubleday, Garden City, N.Y., 1965. 198 pp. Illus. $4.95.

Toward an Understanding of Homosexuality. Daniel Cappon. Prentice-Hall, Englewood Cliffs, N.J., 1965. 316 pp. $6.95.