McLuckie and McKee have done a good job, profusely illustrated with line drawings and diagrams. There are few photographs and the reproduction of some is not up to a standard one would like. One wonders why, and also why some could not have been included to show the ecological types found in the two countries. But the diagrams of cytological and anatomical structures are excellent; the graphs and data in the discussions of physiological processes are clear and meaningful.

Anyone writing or revising an elementary textbook would do well to ponder this book for its organization of topics and for the integration of biochemical and anatomical material. It presumes a knowledge of chemistry and, hence, includes many more advanced discussions of physiology than American introductory textbooks. On the whole, it is clearly written, and rarely can there be doubt in the reader's mind as to what sentences or paragraphs mean. There are remarkably few misstatements or misleading statements that I caught. The emphasis on the physiology of all kinds of plants, especially heterotrophic flowering plants, is most welcome. All in all, McLuckie and McKee have put many people in debt to them for this solid first Australian and New Zealand botany textbook. It will be a valuable addition to the libraries of botany teachers anywhere else in the world for the wealth of information that is in it.

HARRIET B. CREIGHTON
Department of Botany, Wellesley College

Protozoaires: Rhizopodes, Actinopodes, Sporozoaires, Cnidosporidies, vol. 1, pt. II of *Traité de Zoologie: Anatomie, Systématique, Biologie.* Pierre-P. Grassé, Ed. Masson, Paris VI^{e}, 1953. 1160 pp. Illus. Paper, 9035 fr.; cloth, 9215 fr.

With the appearance of this second section of a tripartite treatise on the Protozoa, French biologists have made another signal contribution to their ambitious program of reviewing the phyla of the animal kingdom. The first section dealt with flagellates; the third is to deal with ciliates; the present one covers the intervening groups. It is indeed a far cry from Bütschli's solitary monographic effort (1880–89) to the present treatment, in which nine authorities have collaborated on this single section. Under Grassé's active leadership as editor and coauthor, the Protozoa are being subjected to an extensive reevaluation, group by group. Five subphyla (*sous-embranchement*) are recognized in the *Traité*: Rhizoflagellata, Actinopoda, Sporozoa, Cnidosporidia, and Ciliata. In the present volume, greatest attention will probably be attracted to the rearrangement proposed within the first two of these groups.

The Flagellata (vol. I, fasc. I) and Rhizopoda are established as superclasses of the Rhizoflagellata, in recognition of overlapping affinities and of the polyphyletic derivation of rhizopods from flagellates. The Rhizopoda are separated according to basic pseudopodial types into three classes: Lobosa, Filosa, and Granuloreticulosa. Each of these in turn contains both naked and testate forms. The book opens with Chatton's account of the naked amebas (order Amoebaea). Two distinct groups have been separated: suborder Mastigogenina, possessing flagellate stages in the cycle, and suborder Amastigogenina, exclusively ameboid. In turn, Deflandre has replaced the Testacea of most authors by two orders. The order Testacealobosa (containing most well-known testate amebas) is combined with the Amoebaea to form the class Lobosa, while the remaining forms, bearing filopodia (for example, Euglypha), are placed in the class Filosa. Deflandre also treats the two basal orders (including, for example, Allogromiidae) of the class Reticulogranulosa, while Le Calvez presents a full, authoritative account of the third order, Foraminifera. Cushman's taxonomic system is followed in the interests of expediency, but Le Calvez evaluates it in a critical manner.

The subphylum Actinopoda is subdivided by Trégouboff into three classes: Heliozoa, Acantharia (Actipylean Radiolaria of other systems), and Radiolaria. Evidence is adduced to link the first two of these groups into an evolutionary sequence leading from chrysomonad flagellates, while the independent status of the Radiolaria is emphasized by a suggestion of their dinoflagellate ancestry. In an appendage to the Rhizopoda, Pavillard has presented a relatively brief, informative, and impartial treatment of "doubtful rhizopods or lower fungi": the orders Acrasiae, Mycetozoa, and Plasmodiophorales.

The two remaining subphyla, Sporozoa and Cnidosporidia, have been subjected to more classical treatment. Grassé is responsible for most of the account on Sporozoa. The two principal classes, Gregarinomorpha and Coccidiomorpha, are clearly established as coordinate groups with suggestions of flagellate ancestry. Subgroupings have been modified to form apparently more natural sequences. Grassé chooses to retain the Sarcosporidia as a third class, remaining unconvinced by recent evidence of their fungous affinities. Poisson has written a highly thorough account of the Haemosporidiidea (suborder of Coccidiomorpha), with detailed references to all aspects of the biology of malaria. Poisson is also responsible for the lucid treatment of the Cnidosporidia, without altering the usual arrangement. A few miscellaneous groups of Sporozoa-like organisms are collected in appendiceal chapters; for example, Babesioidea (Poisson), Haplosporidia (Caullery), and certain still more obscurely related types, such as Bartonella, Toxoplasma, Rickettsia, and so forth (Poisson).

The general organization of the book deserves special commendation. Each chapter is introduced with a well-outlined account of the biology of a given group and concludes with a treatment of systematics. There is a complete, up-to-date bibliography at the end of each chapter; the practice of including full titles and pagination of articles cited can be commended to others. The wealth of illustrations is notable for clarity and full documentation of the text; two colored plates,

numerous halftone figures, and some photographs are included. The text seems remarkably free of errors, despite an appendix of *errata* and *addenda*. A detailed table of contents is included at the end of the book, along with an index of 50 double-column pages.

Not all protozoologists will find the systematic treatment and emphasis completely satisfactory. The most difficult problems still reside within the Rhizoflagellata. Chatton's account of the crucially placed Amoebaea (completed after his death by Grassé) seems to suffer from a rather diffuse, less well documented treatment of taxonomic affinities than most other sections, but this group is admittedly difficult to handle. The general emphasis in the work is frankly upon taxonomic and morphologic aspects. Although this organization is not especially fitted to the currently expanding trend toward comparative biochemical and physiological studies on Protozoa, nevertheless a substantial foundation can be assembled from careful selection in the text.

All in all, this section of the *Traité* clearly seems to achieve its major objectives: to organize our current knowledge of these groups of the Protozoa and to indicate future lines of fruitful research.

WILLIAM BALAMUTH

Department of Zoology
University of California, Berkeley

Renal Function. Transactions of the Fourth Conference, 1952. Stanley E. Bradley, Ed. Josiah Macy, Jr. Foundation, New York, 1953. 189 pp. Illus. $3.50.

This report on renal function takes the same form as its well-known predecessors. In addition to an informal discussion of "Ion exchanges between extracellular and intracellular fluids" led by R. F. Pitts, it contains presentations on "Cation exchanges in the renal tubular epithelium" (Mudge), "Ion transport across living membranes" (Ussing), and "Water and ion movements across intestinal and renal epithelium" (Visscher).

As a means of promoting meaningful communication between scientific disciplines, which is a fundamental aim of the conference program, the transactions are probably less useful to the readers than the conference is to the participants. Moreover, the substance of these presentations is no longer new or has been published elsewhere, and the discussions, when read, seem unsatisfyingly diffuse and uneven. In places one finds a spirited, *avant-garde* sort of atmosphere—for example, where a participant vigorously challenges the validity of application of a Donnan-type equilibrium for certain cells—but it dissipates quickly, and one winces at the inclusion of such unregenerate arguments as, "Accuracy is supposed to be one of the virtues of mathematics, and if an equation is found to be inaccurate, I don't see why we keep using it."

This slim volume would have been helped by an index, particularly since many nephrologists will experience a certain obligation to own it. For physiologists at large, however, the report is too specialized and will have limited value. Clinicians, who may be misled by the title, will not acclimate to its rarefied air.

A. V. WOLF

Washington 12, D.C.

British Veterinary Codex 1953. Council of the Pharmaceutical Society of Great Britain. Pharmaceutical Press, London, 1953. 737 pp. 45s. + 1s. postage.

The *British Veterinary Codex,* published under the direction of the Council of the Pharmaceutical Society of Great Britain, sets forth standards for substances and preparations employed in the prophylaxis and treatment of animal diseases, and supplies information on actions and uses of these preparations. The material in it was compiled by the British Veterinary Codex Committee, composed of veterinarians and other interested individuals working in specialized fields of science in Great Britain. In addition, members of the veterinary profession from other countries served as corresponding members of the committee.

These major sections appear: Part I is devoted to monographs that briefly describe the chemical and physical properties, actions, uses, dosage, incompatibilities, and toxicity of drugs and chemicals employed in veterinary medicine. A total of 431 monographs appear. A summary of standards is given for substances that appear in the *British Pharmacopoeia* or in the *British Pharmaceutical Codex.* For agents not listed in these sources, standards prepared by the Veterinary Codex Committee are described. Chemical formulas are in accordance with current practice in Great Britain. Only those agents for which the committee considered there is adequate pharmacological and/or clinical evidence of usefulness and for which adequate standards could be prepared are included. Part II contains similar monographs on antisera, vaccines, and related biological products. Part III lists formulas and describes methods of preparation and standards for therapeutic and prophylactic agents. These monographs are listed according to the type of preparation—boluses, capsules, creams, dusting powders, and so forth. In addition to these major sections, the book contains a therapeutic and pharmacological index, tables of weights and measures, a synonym list, and information on chemical and biological assay methods.

Publication of the *British Veterinary Codex* fills a critical need in veterinary medicine for an authoritative source of information on agents used in the treatment and control of animal disease. All those who participated in this effort are to be congratulated. Perhaps the greatest service rendered by this book is the listing of standards for a number of drugs and biologicals that are widely used in veterinary medicine but for which no such standards appear in other authoritative sources. Veterinarians in the United