Book Reviews

Southern African Mammals, 1758 to 1951: A Reclassification. J. R. Ellerman, T. C. S. Morrison Scott, and R. W. Hayman. British Museum (Natural History), London, 1953. 363 pp., maps. £2.

There has never been much agreement between British and South African authors on problems of South African mammalian taxonomy. Consequently, it is not surprising that a British Museum *Southern African Mammals* should follow by only 2 years the publication of Austin Roberts' handsome volume on the *Mammals of South Africa.*

Roberts had a local point of view, and his taxonomy suffered a fate common to that of many workers in geographically isolated museums. He had a wonderful South African collection but very little material from neighboring regions outside the Union. Under the circumstances, Roberts did remarkably well.

The *Southern African Mammals* of Ellerman, Morrison-Scott, and Hayman is a startling contrast. The attitude of these authors is cosmopolitan. They compare South African mammals with those of India, Europe, South America, and other parts of the globe. The results are revolutionary. Many South African species, in their opinion, have geographic ranges encompassing most of the Palaearctic region. Some, they believe, have their nearest relatives in the Andes Mountains of South America.

The concepts of taxonomy of the authors of *Southern African Mammals* are rather more liberal than are those of most American mammalian taxonomists. They believe that formal nomenclature recognition of subspecies should be abandoned, and they refer to the opinion of Morrison-Scott (*A List of British Mammals,* 1952) that "The species is the natural unit and the thing which really matters." However, subspecies are not abandoned in *Southern African Mammals* and are, as a matter of fact, treated rather conservatively: "whereas it is open to anyone validly (nomenclaturally) to describe a new race in a few hastily written lines, it is quite a different matter to collect together enough evidence conclusively to show that such a description should not have been made" (p. 2).

In view of these stated beliefs regarding the relative value and importance of species and subspecies, it is surprising to find all subspecies carefully listed and only a few synonymized, whereas two or more apparently valid species are frequently thrown together under a single name. The "species" of these authors is often equal to the "species group" of American taxonomists. These inconsistencies probably arise from a failure to admit that all faunas are not equally susceptible to reclassification at this moment. Some, such as the fauna of southern Africa, must wait upon the collection of more extensive study material.

However much disagreement their classification may arouse, it is to the credit of these authors that they have, in most instances, discussed the reasons for the changes they have set forth, so that other workers may have a basis for evaluating their conclusions.

In format, *Southern African Mammals* follows the convenient pattern set by the *Checklist of Palaearctic and Indian Mammals* of Ellerman and Morrison-Scott. It provides statements of geographic distribution, synonymies, citations to important references, taxonomic notes, and a full complement of well-constructed keys. Many important southern African collecting stations are shown on the maps.

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A Practical Manual of Medical and Biological Staining Techniques. Edward Gurr. Interscience, New York, 1953. xix + 320 pp. $4.

This excellent and very useful manual of staining techniques is exactly what the author says it is in his preface: a practical manual "entirely divorced from theory and general statements." It is beautifully bound and clearly printed in easily readable type face, on fine-grade paper. The format shows thoughtful planing on the part of the publishers so that the book is designed as a laboratory companion. It is a quick and reliable reference for those not acquainted with the laborious details of theory who wish to investigate the state of some particular element, such as the cellular proteins or mitochondria.

The author is to be congratulated for his skill in accurately stating complex procedures in concise form. The book reveals his careful knowledge of the original literature. The first section deals with fixative fluids and other matters. From this, the student could determine, for example, in general the kind of reliable information he can expect to secure from tissues that may already be fixed in a particular fluid, such as Regaud's fluid for mitochondria. These fixatives are listed in alphabetical order. On the other hand, the excellent index would quickly tell the methods that reveal mitochondria. (I note that the author recommends a procedure for Regaud's method that differs with Regaud's original article of 1910.)

Section 2 deals with normal and pathologic histology of animals and gives a valuable clear-cut account of staining procedures, which are listed alphabetically along with the kind of element to be demonstrated. This list is conveniently set in boldface type. This book gives the best description of the G-Nadi reaction for oxidase granules I have yet found. The author is the only one who gives the important fact that the dimethyl-*p*-phenylenediamine should be purchased in sealed ampoules.

It is unfortunate that Gurr does not list Brachet's (1942) use of Pappenheim's stain to show ribonucleic acid as red particles and desoxyribosenucleic acid as

blue in the same cell. He tells in brief form the exact method of handling silver impregnation *in the dark,* a crucial point of DaFano's technique that nobody ever seems to tell except DaFano.

Sections of fluorescence microscopy and smear preparations are excellent. There is a valuable appendix, giving formulas of fixatives and stains, refractive indices of various agents, saturation solutions of reagents, and solubility of dyes. The index is very good.

The table of contents serves as a kind of index that is cross-referenced with the final index. This book ought to gain wide popularity with investigators, technicians, and students. Many new procedures are described and old ones are refreshed. The author should try his expert hand at simplifying the use of phase contrast microscopy and microincineration in future editions.

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Chemical Physiology of Contraction in Body and Heart Muscle. A. Szent-Györgyi. Academic Press, New York, 1953. 135 pp. Illus. $4.80.

For the nonspecialist, this book contains both a very readable and a very personal account of recent researches into the mechanisms of muscle contraction. In many ways Szent-Györgyi's book serves as an object lesson in what is to be expected, as present-day experimental biology continues its advances. The way the muscle proteins actin and myosin interact continues to become a more and more complex subject. At the same time, the membrane emerges as a more and more concrete entity, and a good part of this short book is devoted to the description of effects that must be ascribed to membranes. The problems of muscle physiology thus appear to be divided into: a physicochemical study of muscle proteins, the membrane, and the nature of the conection between membrane processes and contraction. The author has something to say about all these problems, and while many of the suggestions advanced are quite speculative, others are certainly the best that can be done in the way of interpretation at present.

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Sample Survey Methods and Theory, Vols. I and II. Morris H. Hansen, William N. Hurwitz, and William G. Madow. Wiley, New York; Chapman & Hall, London, 1953. Vol. I, 638 pp., $8. Vol. II, 332 pp., $7.

The appearance of the two volumes on *Sample Survey Methods and Theory* fulfills a long-felt need in the field of sampling theory and application.

The authors have spent more than a decade in the development of sampling theory and its application to actual survey problems. The scope of the surveys conducted under their direction has probably been the most comprehensive ever conducted by any government or private organization. As a consequence, these books are not merely a restatement of theory and methods already published but are comprehensive discussions of real survey problems, alternative methods of solution, and the fundamental thinking processes that lead to new designs. The separation of the work into two volumes, *Methods and Applications* and *Theory,* enables the reader who is not concerned with development of theory to use the first volume. Anyone concerned primarily with theory and its development can concentrate on the second volume.

One of the principal features of these volumes is the method of presentation. Problems are presented in the same manner in which they evolved for the authors, available data are examined, and the questions asked are "How do we proceed to design a sample survey which can be conducted at minimum cost for a given error?" or "How do we plan a survey that can be designed for a given cost with a minimum error?" The various possible solutions are discussed and the most appropriate one is indicated.

In addition, the practitioner is given numerous rules of thumb which can be used in making a number of decisions in the design of sample surveys. These two volumes will probably be classics in the field of sampling for many years to come and are a must for any person who is involved in the conduct or analysis of any survey.

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Elements of Statistics. H. C. Fryer. Wiley, New York; Chapman & Hall, London, 1954. viii + 262 pp. Illus. $4.75.

This little book is well bound and printed on good paper. It reflects the author's training and his years of experience in teaching and consultation at Kansas Experiment Station. It has benefited by passing through processed versions before going into print. It is not a book planned for experimenters in need of help in design and analysis but rather a textbook for students in probability, elementary statistical methods, and sampling. The preface states that college algebra is a prerequisite for courses based on the text.

A brief chapter on the history of the subject is followed by a chapter on summarizing data, central tendencies and dispersion, which includes calculation of the standard deviation. Chapters follow on elementary probability and on binomial and normal distributions. The uses of confidence limits and chi-square tests are shown as well as the ideas of alternate hypotheses and quality control. These ideas are further developed in the next chapter on sampling normal populations, which includes a brief discussion of central limit theorem and non-normal data. The concluding chapter is on linear regression and correlation, including rank correlation. A number of numerical