istics on the cellular, organismic, and species levels; and (ii) of the significance and limitations of the concept of covariant reproduction.

In the course of the book, Ephrussi refers to the more important alternative interpretations that can be placed upon the facts he discusses, but in so small a book one cannot expect to find them all treated exhaustively and critically. He frankly admits at the start his theoretical bias and conceives his function to be primarily the presentation of evidences and reasons for it. He succeeds admirably in accomplishing his purpose. The book is a clear, informative, lively, and stimulating treatment of a controversial and exceedingly important area of modern biology. It should take and hold an honorable place in the list of books by eminent biologists who have attempted to work toward the synthesis of genetics and embryology.

T. M. SONNEBORN

Department of Zoology, Indiana University

Nuclear Theory. Robert G. Sachs. Addison-Wesley, Cambridge, Mass., 1953. xi + 383 pp. Illus. $7.50.

Books on theoretical nuclear physics are not yet numerous, so it is a pleasure to note the appearance of a new one by an eminent and qualified author. Sachs' book is not an elementary one, in the sense that a good working knowledge of quantum mechanics is demanded of the reader. It might, however, be called elementary in the more literal sense that it is concerned with the "elements" or fundamental ideas of nuclear theory. The central unknown in nuclear physics is, of course, the nature of the forces that act between nucleons; they are not like gravitational forces or electromagnetic forces. They are unfamiliar in our experience and are known only by such qualitative aspects, as, for example, that they are intense and of short range. Their nature can be expected to be revealed most directly in the simplest nuclear systems, and in pursuing these basic concepts the author devotes nearly half of his book to a discussion of two-body systems in which a single proton interacts solely with another proton or with a neutron.

In extending the discussion to the many-body problems encountered in more complicated nuclei, Sachs includes a most praiseworthy description of the shell model and the associated quasi-spectroscopic coupling schemes, including in the treatment a discussion of isotopic spin and supermultiplets. This is perhaps the outstanding part of the book. These subjects are confusing to a student who has to dig them out from original research papers, where they have too often been set forth in unnecessarily complicated language. The basic type of treatment given in this book gives one a chance to see the various aspects of the subject placed in coherent relationship.

Other chapters deal with nuclear reactions, the interaction of electromagnetic radiation with nuclei, and beta decay. Few concessions are made to pictorial representation of the matters under discussion. There are not many figures, and experimental data are not woven extensively into the text, although they are adequately referred to in footnotes. Nevertheless, the logic is developed lucidly and the book is well written, so that the advanced student will not find it formidable reading.

ARTHUR H. SNELL

Physics Division,
Oak Ridge National Laboratory

Encyclopédie Entomologique, Catalogue Illustré des Lucanides du Globe. Texte. 223 pp. Illus. ***Encyclopédie Entomologique, Catalogue Illustré des Lucanides du Globe.*** Atlas. 112 plates. R. Didier and E. Séguy. Lechevalier, Paris, 1953. Both volumes, F. 8000.

The Lucanidae, commonly known as stag beetles because the males of many species have enlarged mandibles resembling antlers with which they often engage in combat, have long been favorites with collectors. Other entomologists have attempted to explain the pattern of wide variation in mandible size that occurs among the males of a single species. This new catalog lists nearly 1100 species, most richly represented in southeastern Asia and the East Indies. Only a few dozen species are Nearctic.

The text volume contains general information, indexes, and some illustrations, in addition to the main catalog. The atlas consists of outstanding illustrations, drawn mainly by the master artist Louis Marie Planet. The majority of plates are designed to show the variation exhibited by a single species. Both authors are veteran entomologists at the Paris Museum. Didier has published regularly on Lucanidae since the middle 1920's, while Séguy is best known for numerous major works on Diptera. The last previous world catalog of Lucanidae, in the Junk series, appeared in 1910. In the United States, Bernard Benesh has been the leading modern student of Lucanidae.

This catalog is in a very useful form, with full generic references and the type species of synonymous genera cited. Original references to species are followed by the main subsequent references. A bibliography of about 220 titles is followed by an index of geographic localities, including the catalog numbers of each species recorded from those localities. An index to species, genera, and higher categories is included. One section (pp. 23–61) has notes on various species and descriptions of new species.

This is a well-prepared work of fundamental importance to all serious students of the family. Although the catalog and plates comprise the main contribution, there also are brief sections of a general character, and readers may wish that they had been expanded. For instance, the discussion of geographic matters has relatively few comments on faunistic relationships. In the concise review of important type categories (p. 19), a cotype is defined differently from the meaning attached to it by most modern taxonomists. The authors prefer the term *variety* for an infraspecific category, and they treat *aberration,*

form, race, and *subspecies* as synonymous; this usage is hardly in accordance with the most up-to-date taxonomy. But such details primarily emphasize the desirability of agreeing on terms, regardless of the country in which we work, and they scarcely mar the excellence of this fine systematic contribution.

ASHLEY B. GURNEY
Entomological Society of America, Washington 5, D.C.

Simultaneous Linear Equations and the Determination of Eigenvalues. L. J. Paige and Olga Taussky, Eds. National Bureau of Standards, Washington, 1953. (Order from Supt. of Documents, GPO, Washington, D.C.) 126 pp. Illus. $1.50.

As the proceedings of a symposium, held 23–25 Aug. 1951 at Los Angeles, California, under the sponsorship of the National Bureau of Standards, in cooperation with the Office of Naval Research, this book contains 19 reports. Eight of these reports deal primarily with general methods, procedures, or theories; seven are concerned with special methods or special machines for computing; three involve interpretation or applications to physical or related mathematical fields; one is bibliographical. Nearly all the papers emphasize the development of computing procedures suited to the capabilities of high-speed digital computing machines, in which the effort and time required for input and output are more important than the number or complexity of internal operations. The resulting problems of the degree of approximation of output data are prominent in most of the papers.

C. R. CASSITY
Research and Development Division, New Mexico Institute of Mining & Technology

A Symposium on the Mechanism of Enzyme Action. William D. McElroy and Bentley Glass, Eds. Johns Hopkins Press, Baltimore, Md., 1954. xvi + 819 pp. Illus. $11.

This volume, which contains the formal presentations and informal discussions of the Fourth McCollum-Pratt Institute Symposium, maintains the high level of excellence that has characterized this series. The general problem of the mechanism of enzyme action has been considered from a variety of standpoints, each aspect being thoroughly reviewed by experts in the field.

Of particular long-range value to chemists working in this area of biochemistry are the reviews presented on the aspects of enzymatic catalysis that are still in a highly developmental stage. Discussions by Kirkwood, Kauzmann, Eyring, Calvin, Klotz, and others are exceedingly stimulating, because of their frank appraisal of the present state of knowledge of the enzyme as a protein and because they indicate some of the essential pathways of research which must be followed for a clearer understanding of enzymatic catalysis. The volume also contains a valuable series of reviews on the mechanism of electron and hydrogen transport and on the general features of group transfers in enzymatic reactions. These subjects are reviewed in such a manner that this volume should serve as a definitive source of literature for some time, even in fields that move as rapidly as these.

As was the case with the previous volumes in this series, the inclusion of informal discussions with a minimum of editorial modification provides additional expansion of the subjects covered in the formal sections as well as a personal touch of humor and whimsy too frequently absent in the discussions of all-too-serious scientists. Bentley Glass has presented his usual well-sifted summary of the entire symposium.

It seems to me that the scientific value of these symposia and the volumes resulting from them is so nearly self-evident that any comments are unnecessary. Nevertheless, for what one man's opinion is worth, the book is highly recommended to students of biochemistry in all stages of development and should be included on any modern bookshelf in this field.

C. B. ANFINSEN
Laboratory of Cellular Physiology, National Heart Institute, Bethesda 14, Maryland

Higher Transcendental Functions, vols. I and II. Based, in part, on notes left by Harry Bateman. Bateman Project Staff, A. Erdélyi, Ed. McGraw-Hill, New York–London, 1953. vol. I, xxvi + 302 pp., $6.50; vol. II, xviii + 396 pp., $7.50.

Tables of Integral Transforms, vol. I. Based, in part, on notes left by Harry Bateman. Bateman Project Staff, A. Erdélyi, Ed. McGraw-Hill, New York–London, 1954. xx + 391 pp. $7.50.

The late Harry Bateman projected a definitive compilation of information about, among other things, special functions and definite integrals, and he left an enormous amount of manuscript material on these subjects. The Bateman Manuscript Project was set up in 1948 by the California Institute of Technology, with support from the Office of Naval Research, to continue Bateman's work. It employed four noted specialists —A. Erdélyi, W. Magnus, F. Oberhettinger, and F. Tricomi—and several assistants. It has now produced these magnificent volumes, which should be on the desk of every scientist who ever has to solve any but the simplest differential equation or evaluate any but the simplest definite integral. One more volume of functions and one more of tables are still to appear.

The scope of these books is not as broad as that dreamed of by Bateman (and actually only a small part of his manuscript material could be used), but the books certainly embody the most useful parts of Bateman's plan and present information in a way that is not even approached elsewhere, either in thoroughness or in ease of reference. It will no longer take less time to derive afresh the properties of a special function needed in a particular problem than to search the literature for them.