Course 309.—Cuban Ornithology. Professor Abelardo Moreno. 3 hours a week (in English). Museum and field work.

Native birds: their classification and description; their behavior, song, nesting, habitat, etc. Migratory birds: periods and conditions of migration. Birds of economic importance. Extinct species. Bird protection.

Course 310.—Cuban Ichthyology. Professor L. Howell. 3 hours a week (in English). Museum and field work.

A practical study of Cuban fish; their geographical distribution in the Antilles; their relations to the North American fauna; their commercial application. Field trips will be taken to fisheries, packing houses and for the collecting of Cuban species.

These two courses are in the hands of extraordinarily competent and attractive naturalists, and I can assure students who may be interested in the fauna of Cuba that they have an unusual opportunity should they be able to take advantage of being in Havana from July 21 to the last of August.

THOMAS BARBOUR

# SCIENTIFIC BOOKS

## STATISTICAL METHODS

*Statistical Procedures and their Mathematical Bases.* By CHARLES C. PETERS and WALTER R. VAN VOORHIS. 13 + 516 pp. New York: McGraw-Hill. 1940. $4.50.

DURING the last few years many books have been written on elementary statistical methods and their application. They have been written by authors in widely different fields such as agronomy, biology, psychology and economics. The books cover essentially the same body of principles, their main differences being in the examples and illustrative material included. The majority of these books can almost be characterized as manuals for the routine application of the methods which are treated. In the opinion of the reviewer, authors of these books, with a few exceptions, fail to present a logical and systematic development of the methods from first principles, which would enable the reader to get a unified view of statistical methodology. Emphasis is placed on routine application at the expense of a proper presentation of assumptions and underlying principles. The result is that the reader often applies the methods incorrectly. He also gets the impression that the subject of statistics is an aggregate of procedures and applications of formulas which should be accepted authoritatively without necessarily understanding them.

This book is an improvement over the usual run of elementary applied statistics books, in that the authors have concerned themselves more than the average author with the statement of assumptions and the systematic derivation of procedures and formulas from the assumptions. The book, however, is by no means self-contained as far as derivations are concerned. In the cases of the more involved derivations references to the literature are given. The book is a joint enterprise of a mathematician and an educational research man. It is a revised and enlarged version of a lithoprinted edition of a book of the same name issued in 1935. The examples and illustrative material used in the book are taken mainly from the field of educational psychology. The normal probability table, Fisher's $t$ and $z$ tables and other commonly used statistical tables are given at the end. Except for a chapter on the rudiments of calculus and chapters on some of the newer statistical techniques such as factor analysis, analysis of variance and controlled experimentation, the book is very similar in many respects to T. L. Kelley's "Statistical Method" (1923), particularly in its subject-matter and manner of presentation.

In their treatment of the classical topics such as measurement of central tendency and variability, correlation theory, sampling variability, etc., the authors have done a commendable job; however, in the chapters on factor analysis and analysis of variance they tended to lapse into a presentation of a routine procedure without giving a full discussion of underlying assumptions. The attention given to probability theory can hardly be regarded as adequate. The introduction of more discussion on probability theory and its application to mean values would have enabled the authors to derive some of their sampling variance formulas with much greater elegance.

Students and teachers in psychology and other branches of social science who are interested in obtaining a little more insight into statistical methods than can be obtained in the average elementary statistics book should find this book quite useful.

*Statistical Methods for Medical and Biological Students.* By GUNNAR DAHLBERG. 232 pp. London: George Allen and Unwin Ltd. New York: Interscience Publishers. 1940. $2.75.

IN recent years there has been a trend toward increased use of statistical methods in various branches of medical and biological research. In this book a medical man, who is the director of the Swedish State Institute for Human Genetics and Race Biology, has apparently presented a treatment on statistical methods primarily to satisfy needs which he has met in his own experience. The result is a book which is very elementary and limited in scope and not very well written from the point of view of statistics. The

mathematical and statistical argument is rather amateurish throughout the book. Many of the modern statistical techniques such as Student's ratio, regression methods, analysis of variance and statistical estimation, used by some medical men, are not even mentioned. The distinguishing feature of the book lies in well-chosen examples and a thorough discussion of them in relation to the statistical methods actually considered in the book. The book should perhaps be useful as an introduction to statistics for those medical and biological students who have only a secondary school mathematical background and who know nothing about statistics.

*Applied General Statistics.* By FREDERICK E. CROXTON and DUDLEY J. COWDEN. 18+944+13 pp. New York: Prentice-Hall. 1940. $4.00.

THIS is perhaps the most comprehensive text-book on elementary applied statistics that has ever appeared. It falls primarily in the category of "descriptive statistics," that is, it deals mainly with the practical problem of collecting, analyzing and presenting statistical data, touching very lightly and incompletely on probability theory and its application to the problem of drawing inferences from the data. The plan of the authors, followed throughout the book, is to introduce the student to the various known elementary descriptive statistical procedures and illustrate them thoroughly with applications, appealing largely to the intuition and common sense of the reader in justifying the techniques rather than undertaking a systematic logical and mathematical discussion of the assumptions and principles underlying them. The book is written primarily for social science students, particularly those of business and economics, with very little mathematical background. Applications of the techniques are made on many well-chosen examples taken from economics, business, sociology and industry. Some idea of the extent to which the methods have been illustrated can be gained from the fact that there are 180 tables and 257 charts in the book. The fundamental concepts and mathematics involved in these methods have not, in the opinion of the reviewer, received adequate attention from the authors, although derivations of some of the simpler formulas have been given in an appendix. The normal probability function, Fisher's $t$ and $z$, Snedecor's $F$ and other commonly used statistical tables are included in appendices at the end of the book. A highly detailed index is given.

The authors have been rather complete in their coverage of elementary descriptive statistical methods commonly used in economics, business and sociology. Teachers of introductory statistics courses in these fields who have to handle students with sketchy mathematical background should find this book well suited to their needs. Many of the research investigators in these fields should find the book useful in increasing the objectivity of their own work.

S. S. WILKS

PRINCETON UNIVERSITY

# REPORTS

## PURE AND APPLIED SCIENCE RESEARCH AT MELLON INSTITUTE, 1940–41

THE thirtieth anniversary of the operation of Mellon Institute's research procedure in collaboration with the University of Pittsburgh was marked by the extension of the range of activities to broad service in national defense. The present emergency has induced much more investigation on problems having important relations to the country's future welfare. Ninety-three industrial fellowships, of which 32 are multiple and 61 individual, have been at work in the institute during its fiscal year, March 1, 1940, to March 1, 1941. These investigations have employed 187 fellows and 114 fellowship assistants. During this fiscal year the institute has spent $1,258,866 in conducting these research programs and its comprehensive studies in pure science, which have been assuming more and more professional and public importance, according to the twenty-eighth annual report of the director, Dr. E. R. Weidlein, to the trustees of the institution.

Chemical, bacteriological and clinical investigations on the chemotherapy of pneumonia have been continued vigorously in the institute's department of research in pure chemistry in cooperation with a staff of medical associates at Mercy Hospital in Pittsburgh. From a chemical point of view the main emphasis, as heretofore, has been in the field of modified cinchona alkaloids. Methods of introducing thiol groups, at desired positions in the cinchona molecule, have been devised, and a study of such sulfur analogs of apocupreine, quinine and alkyl and hydroxyalkyl ethers is in progress. A variety of sulfonic acid derivatives of the alkaloids have been made and tested for action on the pneumococcus. Much work has been done in the cinchonidine series. Monographs are being made ready for release on the chemotherapy of malaria and on structure and antipneumococcic activity in the cinchona series. In a series of cases of pneumonia treated during 1939–40 there was found practically an equal mortality in the treatment with hydroxyethylapocupreine and with sulfapyridine. The results of treatment of 494 pneumonia cases by hydroxyethylapocupreine in the period 1935–40 have shown a marked lowering of