## THE HOUSSAY JOURNAL FUND

A FEW months ago you were kind enough to insert in SCIENCE a brief notice of the attempt of our committee to collect a fund of money for subscriptions to all important American journals in the broad field of physiology and biology for Professor B. A. Houssay, of Buenos Aires. In addition to the note in SCIENCE, all members of the Federation of American Societies for Experimental Biology were circularized. The response to this plea has been generous, for 247 donations were received and a fund of $1,543.28 was secured. This has enabled the committee to send Professor Houssay five years' subscriptions to the eighteen journals he desired, namely:

*Archives of Biochemistry*
*American Journal of Medical Sciences*
*American Journal of Physiology*
*Anatomical Record*
*Annals of Internal Medicine*
*Archives of Internal Medicine*
*Biological Abstracts*
*Endocrinology and Journal of Clinical Endocrinology*
*The Journal of Clinical Investigation*
*Journal of Laboratory and Clinical Medicine*
*Journal of Neurophysiology*
*Journal of Nutrition*
*Journal of Biological Chemistry*
*Journal of Pharmacology and Experimental Therapeutics*
*Nutrition Reviews*
*Physiological Reviews*
SCIENCE

and a sum of $625.90 for subscriptions to foreign periodicals.

The committee takes this means of thanking the various donors for their generous participation in helping our Argentinian colleagues at a time when they were in sore need.

Committee on Houssay Journal Fund,
HERBERT M. EVANS, *Chairman*
WALTER B. CANNON
JOHN F. FULTON
CARL J. WIGGERS

# SCIENTIFIC BOOKS

## STATISTICAL ANALYSIS

*Statistical Analysis in Biology.* By K. MATHER, with a foreword by R. A. FISHER. Nine diagrams. New York: Interscience Publishers, Inc. 1943. $4.50.

THE statistical method is an important tool in a wide range of substantive fields. While the basic procedures are not limited in their applications, the beginner prefers to learn them from a text in which they are applied directly to his own subject-matter. The present volume is by a geneticist for geneticists and other experimental biologists. It begins with the relation between sample and population. Books which open with the problem of statistical inference usually emphasize the contributions of R. A. Fisher and his associates. Mather's book falls in this group. Following a discussion of probability, significance and the basic random sampling distributions, he continues with tests of significance, the analysis of variance, experimental design, relations of two variables, the analysis of frequency data, and concludes with estimation and information.

Some biologists are disturbed by the omission of statistical derivations and mathematical proof, as in Fisher's "Statistical Methods for Research Workers." They will have little complaint with the present book on this score. Mather's approach is primarily algebraic with some elementary calculus. He shows how most of the standard equations can be derived, although those for the basic distributions, including the tests of significance, are stated without proof. In developing the analysis of variance, randomized blocks and similar topics, he inverts the usual order. Starting with combinations and permutations, individual degrees of freedom and their variances are isolated, even though they may be added later to obtain mean squares with several degrees of freedom. In the reviewer's experience many biologists are content with learning how to use statistical equations and enough of their logic to avoid misapplying them. Mather's approach tends to bury the essential simplicity and logic of some of the techniques under the derivation of equations.

Most of the examples in the present volume are new in text-books. Perhaps two thirds of them are genetic, with most of the remainder physiological or agricultural. Some of his topics occur rarely in text-books, such as the calculation of polynomial coefficients, the discriminant function, the method of maximum likelihood, the limitations of inefficient statistics and an extended discussion of the partitioning of $\chi^2$.

On the debit side, Mather uses $N$ instead of $n$ for degrees of freedom, which is the reverse of the convention to which many of us have become adjusted. Symbolism is not consistent through the book, although this is as difficult to attain as complete freedom from errors. Many calculations are carried to several more decimal places than have any meaning. Some statements are open to question, such as the one that "neither $\chi^2$ nor the normal deviate should ever be used when any class frequency has an expectation of 5 or less." Cochran has shown that, in

many applications, smaller expected frequencies still lead to satisfactory tests of significance. Data on the growth of maize are fitted with a polynomial curve, although the equation has no obvious biological interpretation. Because they are easy to handle statistically, polynomial curves are often computed without regard to their physical meaning. Their chief descriptive value is in indicating how many fitted constants may be needed in a rational equation which would define the relation. These limitations have been overlooked. A number of misprints have crept into the text, sometimes into equations. Presumably, they will be corrected when the book is reprinted. It is to be hoped that later editions will include some of the important topics which have been omitted, such as the analysis of experiments with missing values, transformations to stabilize the variance, the $\chi^2$ test for homogeneity of the variance, tests for normality and a more critical discussion of the errors which are pertinent for the different comparisons of a complex experiment.

C. I. BLISS

NEW HAVEN, CONN.

## ANTIBIOTIC AGENTS

*Penicillin and Other Antibiotic Agents.* By WALLACE E. HERRELL. 348 pp. Philadelphia and London: W. B. Saunders Company. 1945. Price $5.00.

DURING the last five years, penicillin has attracted world-wide attention. Ever since its discovery and description by Sir Alexander Fleming, of St. Mary's Hospital in London, in the year 1929, there has been some interest in this substance, but it required the stimulus of a war to develop it to its present stage. The demonstration by Florey and his group of associates that penicillin could be produced in a form that was non-toxic to man, and that it could be used effectively in the treatment of staphylococcic infections, stimulated others to study this substance further. The development of penicillin from a laboratory curiosity to the present stage of mass production has been one of the great scientific achievements of our time. It is one of the outstanding examples of collaborative efforts on the part of governmental agencies, private industry and university and hospital personnel and laboratories. The results speak for themselves. There is no drug that can do as much for so many different infections and cause no harm to the patient. When one considers this agent is effective against the two most prevalent genitoinfectious diseases, as well as many disorders caused by gram positive microorganisms, it is possible to classify penicillin as a truly remarkable drug.

In this monograph, Dr. Herrell has summed up his own experience with penicillin and reviewed the published work of many others. There are a number of excellent illustrations and charts, and the material is well organized and presented in a manner that is pleasing to the reader. Dr. Herrell's wide experience in this field has made him peculiarly fitted to present the subject in a thoroughgoing manner.

All physicians will want to read this monograph, which gives the results of the treatment of many diseases. A wealth of material is now accumulating in such clinical disorders as war wounds, syphilis and bacterial endocarditis, and while the early published results are most impressive, it is not possible at this time to assess the final results in such diseases as bacterial endocarditis and syphilis.

This monograph, then, can not be recommended too highly. The printing is of high quality, the bibliography is comprehensive and the index is good. Finally, the content makes excellent and satisfying reading.

CHESTER S. KEEFER

EVANS MEMORIAL HOSPITAL,
BOSTON

## WEEDS

*Weeds of Lawn and Garden.* By JOHN M. FOGG, JR. 215 pages. Philadelphia: University of Pennsylvania Press, 1945. $2.50.

THERE must be thousands of victory gardeners who are taking the hard way to get acquainted with weeds. If any of them desire to know the names, the habits or the origin of our common weeds, they will find a convenient means in Dr. Fogg's book. Here they will find notes on 242 different kinds of them and for almost every kind a non-technical description and an excellent half-page illustration. Often the young stages of the weed are shown, which is an especially valuable feature for the gardener. An introductory chapter discusses why some plants are weeds, how they are so widely and quickly dispersed over the country and how they may be exterminated.

H. A. GLEASON

NEW YORK BOTANICAL GARDEN

## BOOKS RECEIVED

HOLMBOE, JÖRGEN, GEORGE E. FORSYTHE and WILLIAM GUSTIN. *Dynamic Meteorology.* Illustrated. Pp. xvi + 378. John Wiley & Sons, Inc. $4.50. 1945.

HOLMES, HARRY N. *Qualitative Analysis; A Brief Outline.* Ninth edition, revised. Pp. vii + 52. The Macmillan Company. $1.10. 1945.

LOWRY, H. H., Editor, for the National Research Council. *Chemistry of Coal Utilization.* Illustrated. Vol. I, pp. 920. Vol. II, pp. 921–1868. John Wiley & Sons, Inc. Two volumes, $20.00. 1945.

STRECKER, EDWARD A., and KENNETH E. APPEL. *Psychiatry in Modern Warfare.* Pp. viii + 88. The Macmillan Company. $1.50. 1945.

THOMPSON, PAUL V., Editor. *University of Colorado Studies; Series D, Physical and Biological Sciences.* Pp. 55–293. The University, $1.00.