

SCIENTIFIC BOOKS

STATISTICAL REASONING

Elements of Statistical Reasoning. By ALAN E. TRELOAR, Ph.D. xi + 261 pp. New York: John Wiley and Sons. 1939. \$3.25.

THIS is a presentation of fundamental principles of statistics, for readers whose mathematical preparation does not extend beyond elementary algebra. It is designed to explain the purpose, meaning and use of the most important measures of central tendency, dispersion, correlation, statistical significance and goodness of fit. Its aim is the thorough elucidation of those ideas which are of primary importance, rather than superficial treatment of a multiplicity of special topics.

Although nearly half of the book is concerned directly or indirectly with the study of errors of random sampling, detailed discussion of "small-sample techniques" is reserved for another volume. The emphasis here is on the conditions under which the various special forms of frequency function are sufficiently approximated by normal distributions. While full value is ascribed to the significance of the more elaborate analysis in the cases for which it is required, there is no concealment of the conviction that a good big sample is better than a good small sample.

While not technically mathematical beyond the level indicated, the book is not intended for readers who are unable or unwilling to do the kind of accurate thinking which mathematics is designed to facilitate. It is of serious interest to the more advanced student as an essay in determining the extent to which language can be made to supplement or replace mathematical formalism in the precise expression of quantitative ideas. Within the bounds set for the project, anything that can not be formulated in terms of elementary algebra has to be put into words. Naturally there are limits to what can be accomplished in this way; on the other hand, any array of formulas requires the illumination of verbal analysis, and this may well precede detailed study of the formulas themselves, even for a student who is prepared to undertake the latter. It is apparent on every page that the author is in the habit of compelling words to say exactly what he wants them to say, not of tolerating any irresponsibility on their part, and they are made to convey abstract ideas with a surprising degree of definiteness. Rarely they are allowed a moment's deliberate relaxation, as in the reservation, "if sex and goodness are independent," in connection with the multiplication of probabilities, or in the remark in the chapter on vital statistics that "those who die cease to be reporters of events to any terrestrial government." There are a few lapses, a few passages less

clearly organized than the rest, and a few places where the reader may be led to think that he is expected to understand immediately something which in fact requires extended explanation; but in general the standard of expression is high. Quotable sentences are numerous.

The illustrative examples are carefully selected and thoroughly explained. While they are mostly taken from biological settings, the numerical data and statistical principles involved are so clearly set forth that the reader whose interest is in other fields of application will have no difficulty either in comprehending them or in adapting their essential features to his own work. The diagrams and tables are gratifying to the eye as well as to the understanding.

The typography is generally excellent. A few errors have been noted. The number 54.125883 in the table on page 57 should be 54.135883; and an exponent 2 is missing in the same panel. The minus sign in the square root on page 140 should be plus; the correct formula appears on the next page. The value of P on page 223 should be .24 instead of .30.

This book will repay careful reading even by students of considerably more technical advancement than those for whom it is primarily designed to serve as an introductory text.

DUNHAM JACKSON

ANALYTICAL CHEMISTRY

Chemical Analysis. A Series of Monographs on Analytical Chemistry and its Applications. Vol. II. *Chromatographic Adsorption Analysis.* By HAROLD H. STRAIN. 222 pages; one colored plate; 37 illustrations. New York: Interscience Publishers, Inc. 1942. \$3.75.

THIS excellent analytical handbook covers its important field admirably, both qualitatively and quantitatively. Chromatographic adsorption analysis has become an indispensable adjunct for the final separation of mixtures difficult or impossible to resolve by any other method.

Originally introduced by the botanist Tswett, for the separation of plant pigments, it has been eagerly seized upon, particularly by the organic and biological chemists, for the solution of many extremely troublesome problems of purification. Yet the operations involved are relatively simple and the equipment inexpensive.

A most appropriate colored plate constitutes the frontispiece. It depicts the appearance of two adsorption columns; one showing the separation of carotenes, and the other that of the xanthophylls, with

their characteristic so-called "chromatograms," or series of colored bands. The illustrations in the text are well chosen and most helpful. As the author states in his preface, the "major emphasis has been placed upon experimental procedure," and the information supplied in this direction is exceptionally full and critically presented. Following the Historical Introduction (9 pp.), are chapters on the Applications of Chromatographic Adsorption Methods (20 pp.), Apparatus and Procedure (18 pp.), Adsorbents (18 pp.), Solvents and Eluants (6 pp.), and Location of Colorless Adsorbed Substances (6 pp.).

As might be expected, chromatography has not found so many applications in the case of Inorganic Compounds (8 pp.). In the field of Organic Compounds (70 pp.), it has rendered the greatest service—simple aliphatic and aromatic substances, homo-

cyclic and heterocyclic compounds, sterols and related compounds, vitamins, hormones, enzymes, co-enzymes, proteins, anthocyanins, pterins, chlorophylls, hemoglobin derivatives, bile pigments, carotenoids, coal-tar dyes and various natural substances. The volume closes with a résumé of the Industrial Uses (8 pp.) to which the method has been put.

An elaborate Table of Contents makes clear the helpful way in which the subject-matter is organized and presented, and this is supplemented by both an Author Index and a Subject Index. By no means the least valuable feature of the work is a Bibliography covering 42 pp.

The book is heartily commended to all chemists interested in this method of analysis.

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SOCIETIES AND MEETINGS

THE UNION OF AMERICAN BIOLOGICAL SOCIETIES

THE annual meeting of the Council of the Union of American Biological Societies was held in Dallas, Texas, on Monday, December 29, at 4:00 in the afternoon.

As in the past the Union has been concerned with a number of items of general interest to biologists throughout the country. One of the primary concerns of the organization has been *Biological Abstracts*. Dr. John E. Flynn, editor-in-chief of this journal, reported to the Union that the Abstracts for Volume 15 showed a 45 per cent. greater number of abstracts than Volume 14. He furthermore pointed out that whereas 1,105 periodicals were being abstracted in March, 1941, 1,550 periodicals were being abstracted in December of that year, a net increase of 445. A special effort has been made to arrange for the abstracting of foreign journals, many of which are now difficult or impossible to procure in this country. The steadily increasing cost of publication of the abstracts was pointed out, but it was explained that since, of course, *Biological Abstracts* was a non-profit organization, all money which has become available has been used as efficiently as possible to maintain and improve the journal. It was assured that when more money would be made available, *Biological Abstracts* would be correspondingly enlarged and improved. It was stated that the Abstracts had operated without a continuing deficit in the past, but that this could no longer be done now that all foreign subscriptions except those of South America and the British Empire were most probably lost. Dr. Flynn called the attention of the council, however, to certain encouraging signs, namely,

the significant increase in subscriptions by United States and Latin American biologists. Since spring the number of subscriptions of the latter group had increased 100 per cent. or more. Despite the fact that American biologists are becoming increasingly aware that *Biological Abstracts* is their own instrument, this journal still needs much greater support in the form of individual subscriptions before it can become as complete as biologists would wish it to be.

The council unanimously approved a plan to have the president of the Union appoint a committee to study the possibilities for expansion of interest in, and cooperation with, *Biological Abstracts* by the Latin-American countries.

Beginning January, 1942, *Biological Abstracts* is establishing a sixth section, Section F, entitled, "Animal Production and Veterinary Science." This has been done in order to provide for the needs of men employed in the animal industries.

A second general project with which the Union has been concerned is aid to the National Central Library of China. This project has recently been almost completely at a standstill, due to the war in the Far East.

Through one of its committees composed of E. V. Cowdry, F. L. Fitzpatrick, H. B. Glass, B. C. Gruenberg, O. Riddle and E. W. Sinnott, the Union has been investigating for a number of years biological science teaching in secondary schools. The final report of this committee was made by its chairman, Dr. Oscar Riddle. Two preprinted copies of the 76-page report were submitted to the Union Council. This report contained an analysis of 3,186 returns on a questionnaire sent to teachers of biology in secondary schools. Dr. Riddle stated that five of the six segments of this report had already been published earlier in the