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