In general, the excellence attained in the first two volumes is maintained in this one. Particularly outstanding is the treatment of *p*-aminobenzoic acid and pteroylglutamic acid. More than 200 pages are devoted to these related vitamins, an indication of the thoroughness attempted. Despite this thoroughness, a few literature oversights were noted together with several minor errors in structural formulas. A shortcoming apparent in this volume, in contrast to the earlier ones, is a more limited use of gross and histological photographs in association with the pathology of the specific vitamin deficiencies. Tables on the occurrence of certain vitamins, particularly of pteroylglutamic acid, pyridoxine, and *p*-aminobenzoic acid, should be of value to nutritionists. However, a more detailed presentation of the occurrence of several of the other vitamins would have seemed desirable.

With the publication of this final volume, a very excellent series of reference books on the vitamins is now available and should be most welcomed by biochemists, nutritionists, and other investigators.

H. E. SAUBERLICH
Department of Animal Husbandry and Nutrition, Alabama Polytechnic Institute

Dictionary of Mathematical Sciences, English-German. vol II. Leo Herland. Ungar, New York, 1954. 336 pp. $4.50.

The first volume, German-English, of this dictionary was published some time ago.

The designation, "mathematical sciences" is here taken quite broadly to include statistics (entries by Gregor Sebba) and commerce (entries by Robert Grossbard). One might well expect the statistics, but possibly not the commerce. In addition, there are entries identified as arising from acoustics, architecture, astronomy, aviation, ballistics, cartography, chemistry, crystallography, electricity, electronics, engineering, finance, geography, geology, insurance, logic, magnetism, meteorology, optics, and physics, not to mention the several branches of mathematics proper.

The lexicographer's lot is not an easy one, and at least this particular nonlexicographic reviewer would stand in some awe before the mere task of deciding which entries to include and which to omit. For example, there is an entry *paralogism,* but none for the antonym *sophism.* Certainly, if either term is to be left out, it should be *sophism.* One can think of arguments both pro and con, or the omission could have been an oversight. This is a trivial example. On the other hand, there are entries for the suffixes *-digit, -sheeted, -sided,* but none for such ubiquitous prefixes as *poly-, mono-, bi-, deci-, centi-,* and *mega-.* In fact, if there are any prefixes, they are very few. There are some proper names and adjectives derived therefrom: *Boyle, Galois,* and *Galton,* but neither *Boole* nor *Boolean.* The use of *proper,* as in *proper value* and *proper vector,* is not recognized. Throughout there are innumerable decisions to be made. The criteria are not always clear, but none of the omissions would seem to impair the utility of the result to any extent. These points, therefore, are made, merely for descriptive purposes and with no implied criticism.

On the positive side, the most noticeable feature of the *Dictionary* is the great abundance of cross references. For example, under the single entry *field* there are 50 cross references. This is, of course, extreme, but indicative. Another feature is the abundance of phrases, each listed under the most important word of the phrase, be it substantive or modifier. One wonders at times about the selection of key words; thus, *health insurance* is a separate entry, but *group insurance* comes under *insurance.*

No pronunciations are given except for an occasional accented syllable in German words. English words are separated etymologically (not by syllables), but the etymologies themselves are not given. English parts of speech and genders of German nouns are included. Indication is made where a usage is peculiar to American or British English, as in the inelegant American use of *billion* and *trillion.* The arrangement throughout, including the preface in both English and German, is such as to make this book equally usable to readers of German or English.

Three typographic errors have been noted, none of which could cause confusion. Altogether, the volume should prove extremely useful both to the German speaker reading English and to the English speaker attempting to write in German.

ALSTON S. HOUSEHOLDER
Mathematics Panel, Oak Ridge National Laboratory

Mathematics in Type. William Byrd Press, Richmond, Va., 1954. xii + 58 pp. Illus. Paper, $3.

It is unfortunate that few authors of papers or books on mathematical subjects know so little about the possibilities or limitations in mathematical composition. The staff of the William Byrd Press made a thorough study of the problem, during which it sought the advice of many organizations, and now presents a plea for foresight on the part of an author in his use of mathematical symbols.

A machine is limited in what it can economically do; a mathematician seems to possess unlimited inventiveness so far as symbolism is concerned. Unless an author does use good judgment in his writing, the cost of composition for his paper or book will be great.

By means of well-chosen examples and clear exposition, this small book presents excellent advice. The type face itself is that used in many mathematics publications. This adds to a reader's visual concept of what a printer can do with his manuscript. In the discussion of preparation of a manuscript, any mathematician will find suggestions that will save himself, his editor, and his printer much work.

On page 15, "totalling" sent me rummaging for a dictionary. The tradition of the impossibility of pub-

lishing an error-free book is carried on, for on page 19 there is a broken integral sign and on page 21, last line, there is "!more to come!" which, if it is not an error, is not at all clear.

For one whose manuscript was printed by the William Byrd Press, the dedication was particularly significant:

> For the first mathematician who may find in these pages something of assistance toward more satisfactory and economical publication.

If this book had been available earlier, truly much revision and much retyping would have been avoided.

MYRON F. ROSSKOPF
Teachers College, Columbia University

The Ocean Floor. Hans Pettersson. Yale Univ. Press, New Haven; Oxford Univ. Press, London, 1954. xv + 181 pp. Illus. $3.

There are various kinds of progress reports, ranging from those that say simply that progress has been made to those that say that it is hoped that progress will be made (none of them, of course, ever admit that progress has not been made), but few of them actually say *what* progress has been made. Pettersson's Silliman lectures are a fine example of the best sort of progress report—a stimulating account of what is being accomplished in an active field of research. We must call them progress reports because many of the findings are still preliminary and subject to revision, and others are still not thoroughly understood.

Study of the deep sea is no longer a superficial analysis of a few thimblefuls of bottom mud and an occasional water sample; it is an intricate study of trace elements in long cores with all the devices of the atomic age, combined with careful analysis of the remains of minute organisms in the best classical tradition. The difficulties and complexity of such studies will be fully realized when it is remembered that the material for them was gathered by the expedition of the Swedish *Albatross* in 1947–48. Preliminary results from subsequent expeditions have also been included, and the final interpretation of these investigations may not be made for many years.

JOEL W. HEDGPETH
Scripps Institution of Oceanography

Statistics in Research. Basic concepts and techniques for research workers. Bernard Ostle. Iowa State College Press, Ames, 1954. xiv + 487 pp. Illus. $6.95.

Contemporary research in both the natural and the social sciences is permeated by statistical thinking and, whether or not the research worker is aware of it, he applies methods of statistics. Thus it behooves every conscientious investigator to familiarize himself, as well as his mathematical training permits, with the techniques that have been worked out to deal efficiently with the large numbers of items whose individual or aggregate behavior falls within the scope of his investigation and from which the chance element is not absent.

Notwithstanding the many good textbooks of statistics that have appeared recently, there was a definite need for a guide that would give every research worker a clear understanding of the fundamental concepts of statistical methods, at a level commensurate with the mathematical equipment he may be able to apply to specific research objectives. This goal is achieved by Ostle in an admirable and incomparable way. He not only presents modern statistical methods, but also shows when and how to apply them.

If, in perusing this remarkable book, the student or research worker has become fully aware that statistics, although singular as a scientific method, is yet the plural of statistic, he will have gained a great insight and higher proficiency in his research. The chapter that deals with the design of experiments is outstanding in its conciseness and clarity. It is regrettable that because of poor indexing many valuable items are unavailable for quick reference.

FRANCIS JOSEPH WEISS
Washington, D.C.

Qualitative Analysis Using Semimicro Methods. Esmarch S. Gilreath. McGraw-Hill, New York. viii + 287 pp. Illus. $5.

The author's stated purpose in writing this one-semester textbook is to satisfy the demand for a broader theoretical approach with less emphasis on laboratory exercises. He hopes it will reverse the trend away from a subject that offers unparalleled opportunities for presenting and amplifying many of the fundamental principles of inorganic chemistry.

The text is divided into theoretical and laboratory sections. Ten chapters cover the properties and behavior of electrolytes. There are 228 numbered problems and exercises. Approximately one-half of these require numerical calculation.

The Fresenius scheme of cation analysis is followed, except for departures in groups III and IV. Anions are studied by the Dobbins and Ljung system [*J. Chem. Educ.* **12**, 586 (1935)].

The laboratory work is on a semimicro scale. The behavior of knowns is studied first, followed by an outline for a complete analysis. The appendix contains directions for analyzing 10 unknowns, a suggested class assignment program, a list of reagents and test solutions as well as tables of useful information.

The book is well written, with a minimum of typographic errors. Laboratory directions are clear and complete.

WILLIAM MACNEVIN
Department of Chemistry, Ohio State University