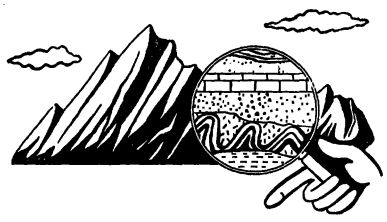
No review of Dr. Raisz's latest book would be complete without mention of the chapters dealing with the application of cartographic and related techniques to the presentation of statistical information. Many excellent methods of putting life into inert masses of figures have been described and illustrated. Statisticians, economists, and geographers will do well to study these chapters carefully.

General cartography is the work of a scientist and artist. It is a contribution to the subject of cartography and will play an important role in the development of the science.

WALLACE W. ATWOOD, JR.
Research and Development Board



Sedimentary rocks. F. J. Pettijohn. New York: Harper, 1949. Pp. xv + 526. (Illustrated.) $7.50.

Sedimentary rocks, by F. J. Pettijohn, comes at an opportune time, 10 years after the last comprehensive volume on sedimentation was published by Twenhofel. Pettijohn's treatise is essentially a study of the products of sedimentation rather than its processes. The book begins by summarizing the general nature of sedimentary rocks and discussing their principal attributes: texture, mineral and chemical composition, structure, and color. A chapter on classification follows, and then the principal types of sedimentary rocks are described in considerable detail. The work concludes with a discussion of the processes of weathering, transportation, deposition, and diagenesis.

The general approach is well balanced and attention is focused on the more important aspects of sedimentation. Minor controversial features are dismissed with brief discussions or reference to pertinent literature. The 700 citations to previous literature are well chosen and up to date. Pettijohn's general appraisal of other authors' work is good, but he places more reliance on the validity of some inferences he cites than this reviewer would. The volume contains many tables on the chemical and mineralogical composition of sedimentary rocks. The illustrations are well chosen and include many graphs showing quantitative relationships of properties of sediments to one another. The index is moderately good.

This book is so worthwhile that any attempt to point out its weak parts is likely to overemphasize them with respect to the work as a whole. The discussion of black shale, ocean and lacustrine deposits, and the fundamental physical and chemical processes affecting sediments seems to be less effectively treated than other subjects; but on the other hand the discussion of glacial sediments, abrasion of particles, quantitative aspects of sedimentation, and applications of laboratory studies to the interpretation of sediments is extremely stimulating. The section on geosynclinal sedimentation is particularly interesting.

Pettijohn has proposed a new classification of sedimentary rocks, partly descriptive and partly genetic. Geologists may have mixed feeling over some of the names that are recommended. For example, to call a quartzose sandstone an "orthoquartzite" is likely to cause confusion, because of the well-established usage of the term "quartzite" in metamorphic geology. On the other hand, the designation of the term "graywacke" for an indurated feldspathic sand with a clay or chlorite matrix seems quite useful.

This volume, according to the author, is designed as a text for senior and graduate students. It is also a handy book for the mature worker and altogether represents a distinct contribution to geology.

PARKER D. TRASK
Oakland, California

Geology and paleontology. (Fiat Review of German Science, 1939–1946.) Ludwig Rüger, et al. Berlin: Office of Military Government for Germany, 1948. Pp. 246. (Illustrated.)

This volume is one of a series which, in the words of its sponsors, is intended to "present a complete and concise account of the investigations and advances of a fundamental scientific nature made by German scientists in the fields of biology, chemistry, mathematics, medicine, physics and sciences of the earth during the period May 1939 to May 1946." The series will include reviews of work on 44 subjects within these fields; some subjects, such as inorganic chemistry and applied mathematics, require five or six volumes.

Besides the present volume, the earth sciences are represented in the series by four volumes devoted to geography, one to mineralogy, and two to petrography.

The following have contributed reviews to Part I of the work (general geology): L. Rüger (geologic chronology; interior of the earth, vulcanism); D. Schachner-Korn (structural geology); K. H. Scheumann (petrotectonics of the Variscan and pre-Variscan crystallines on the northern border of the Bohemian Massif and in the Sudeten); A. Strigel (tectogenesis of the European and North African Variscan [Hercynian]); W. Carle (post-Variscan tectonics in central Europe); A. Bentz (salt domes, petroleum geology); W. Schott (recent deep-sea sediments); E. Stach (coal petrography); E. Blanck (weathering); and H. E. Stremme (soil science).

To Part II (formations) the following contributed: M. Schwarzbach (Cambrian); G. Solle (Devonian); A. Strigel (Carboniferous, Permian); W. Schott (Triassic, Weissjura); K. Hoffmann (Lias and Dogger); O. Seitz (Cretaceous); A. Schad (Tertiary of northwest Germany); E. Wirth (Tertiary of the upper Rhine Valley); and E. Ebers (Quaternary geology of the Northern Alps).

The third and last section, paleontology, is constituted as follows: H. Hiltermann (micropaleontology); M.

Schwarzbach (sponges, corals, brachiopods); H. Sieverts-Doreck (echinoderms); H. Schmidt (palaeoammonoids); F. von Huene (fossil vertebrates).

As is almost inevitable in such an undertaking, the reviews differ greatly in degree of detail. In part this is a valid reflection of the times; the section on salt domes (nine pages plus a map), while disproportionately long at first glance, is an obvious result of the wartime search for oil. Stress on practical applications of soil science and upon soil-mapping techniques is in part a result of the war; in addition, there is great interest in detailed investigations of soil genesis.

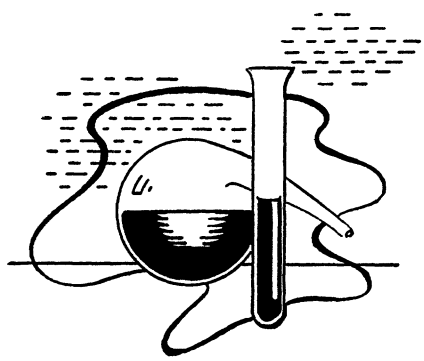
Work in petrofabrics and tectonics has occupied its usual conspicuous position in German geology, as evinced by extended treatment of the subject in general and its application to various regions. Paleontology has not fared so well.

Each section of the volume is accompanied by a bibliography. These are extensive and will be most useful.

The contributors and subjects are listed here because the present edition is a limited one, for government distribution (inquiry should be made to Office of Military Government for Germany [U.S.], Economics Division, Research Control Branch, U. S. Army, APO 742, Berlin). The manuscript for the volume has been turned over to a committee of German scientists for reprinting and perhaps wider distribution. It is hoped that this will be possible. The Office of Military Government is to be congratulated for sponsoring such a valuable synthesis.

FRANK C. WHITMORE, JR.

U. S. Geological Survey



Aquametry: application of the Karl Fischer reagent to quantitative analyses involving water. John Mitchell, Jr., and Donald Milton Smith. New York: Interscience, 1948. Pp. xi + 444. (Illustrated.) $8.00.

This book, Volume 5 of a series of monographs on analytical chemistry and its applications, brings together for the first time everything that has been published on the theory and use of the Karl Fischer reagent. Written by the two outstanding investigators in this field of chemical analysis, it will serve those who are already experienced in the use of the Karl Fischer reagent as well as those who are beginning to use it for the first time. It is well organized and clearly written.

The book was not intended to be a comprehensive treatise on all the methods for the determination of water. But the authors have given a brief and thorough review in the first chapter of the various techniques already published.

Part I deals with the specific quantitative determination of water by Karl Fischer reagent, and an early chapter presents an orderly summary of the directions for preparing and standardizing the reagents. All of the procedures which make use of the reagent are given here and this part of the book will serve as a convenient laboratory manual.

The nature of the chemical reactions involved are thoroughly discussed, with much quantitative data never before published. A chapter is devoted to the various titrimetric procedures, both macro and micro, that have been found useful. The determination of water in various organic compounds, in commercial organic materials, and in inorganic compounds is then considered. The final chapter of Part I is concerned with the spurious reactions of Karl Fischer reagent with inorganic compounds which must be guarded against.

Part II presents various applications of Karl Fischer reagent to those types of organic reactions where water is liberated or consumed. Methods are given for the quantitative determination of the following organic functional groups: alcoholic hydroxyl, carboxylic acids, acid anhydrides, carbonyl compounds, amines and nitriles, peroxides, and a few miscellaneous organic compounds.

The final chapter discusses some proposed further studies involving Karl Fischer reagent, such as possible modified reagents, applications to organic reactions which interfere with the present reagent, and quantitative determination of inorganic compounds.

GRANT WERNIMONT

Eastman Kodak Company,
Rochester, New York

Principles of high-polymer theory and practice. Alois X. Schmidt and Charles A. Marlies. New York-London: McGraw-Hill, 1948. Pp. xii + 743. (Illustrated.) $7.50.

Most books on this subject are too specialized to give the uninitiate a broad, clear picture of the nature and behavior of high polymers. Again, most authors are so preoccupied with describing the characteristics of specific materials that they too frequently overlook the fundamental principles underlying all high polymers. As a result such books are of interest primarily to those engaged in special fields of high-polymer chemistry, physics, or engineering, and are not particularly suitable for use as textbooks.

The authors' aims in writing this textbook on the *principles* of high-polymer theory and practice have been to avoid shortcomings such as these, "to present a broad, coordinated treatment of a field in which about one-third of all American chemists and chemical engineers are currently employed," and to demonstrate "how fundamentals of physics, chemistry, and engineering may be applied universally to the materials in question." As