words on metal-semiconductor rectifiers.

Compared to other books in the field, *Physics of Semiconductors* is more current and authoritative, and more oriented to devices, in its selection of topics and emphasis, although it is less comprehensive than R. A. Smith's *Semiconductors*. In the field of devices, it is less complete than, for example, L. B. Valdes' *The Physical Theory of Transistors*, but with respect to the areas treated it is generally more thorough than Valdes.

The author has succeeded in his "intention not to be all-inclusive but to present the concepts and related theories . . . in such form as to encourage further investigation."

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Anatomy of Fishes

Handbuch der Binnenfischerei Mitteleuropas. H. H. Wunsch, Ed. vol. 2A, *Anatomie der Fische*. Wilhelm Harder. Schweizerbart'sche, Berlin, 1964. Text volume, xiv + 308 pp.; plates, vi + 115 pp. Illus. Paper, DM. 94; cloth, DM. 103.

In *Anatomie der Fische*, the latest volume of this series which is under the general editorship of H. H. Wunsch, Wilhelm Harder attempts to assemble and present the great mass of scattered information on the morphology and anatomy of fishes in an organized fashion. As the author notes, despite the series for which it was intended, the text is not limited to an antomy of European freshwater fishes but includes data on and covers the literature of fishes as a group.

This general anatomy of fishes, which is the first published in German since the middle 1800's, attempts to treat body structure according to classical systems (skeleton, musculature, respiration, and the like). The method of treating anatomical nomenclature is useful in that several of the most commonly used synonyms are indicated. However, the material included in the various sections differs markedly and does not always reflect the data available.

The author in his preface goes to some length to explain the breadth and depth of the literature examined and employed in the text. Therefore, in spite of the extensive bibliography, the variation in text and reference material afforded the different sections is somewhat surprising. For example, discussion of the endocrine system contains no reference to the extensive work of Pickford and Atz. Although physiology is a special topic of another volume in the series (vol. 2B), some reference to this subject is, of course, necessary in a text that treats anatomical aspects. But it is surprising that Margaret Brown's two-volume work on the physiology of fishes is not cited among the many texts that are noted. Nor is Harrington's fundamental and widely accepted paper on the osteology of fishes mentioned. Nevertheless, the book and its accompanying volume of figures provide an excellent summary of fish anatomy and of the widely scattered pertinent literature. A minor criticism is that the zoological nomenclature, in spite of the author's statement to the contrary, is not wholly modern, and the subfamily designations (which apparently follow Berg) are in contradiction to the International Rules of Zoological Nomenclature.

The book is very clearly written and should not be difficult for the student who has only a minimum knowledge of scientific German.

Additional useful features of the volume are a separate glossary of syncranial bones, the 17-page bibliography previously noted, and an index prepared with Teutonic thoroughness (24 pages). The accompanying volume of figures and plates is composed largely of reproductions from other sources, but again it is useful to have illustrations of a wide variety of structures available in a single volume. The plate illustrating the bones of the syncranium is particularly noteworthy in that the various bone series (circumorbital, opercular, and suspensorium) are printed as overlays to be used in conjunction with the base figure of the neurocranium.

A handbook that attempts to cover as much ground as Harder has attempted to cover here is bound to be criticised, for each specialist would enjoy an expansion of a particular interest. Nevertheless, *Anatomie der Fische* is an excellent and a clearly written summary of available data on the subject. A possible inhibition to its extensive use will be its excessive cost.

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Pictorial Geology for Laymen

The Earth Beneath Us. Kirtley F. Mather. Random House, New York, 1964. 320 pp. Illus. $15.

During a period of 30 years a large number of students at Harvard University took advantage of the opportunity to sit in Kirtley Mather's lectures and become infused with his enthusiasm for geology and the natural world. But this was not as large an audience as Mather deserved. Now, at long last, that audience will be greatly expanded by the fulfillment of his "long-nurtured ambition to produce a pictorial geology for the layman." That is exactly what he has done.

The Earth Beneath Us, the story of the development of the landscape on the parts of the world we can see, should be as interesting and informative to the person who has had a course in general geology as it will be to the one who wants to become informed about this field of science. In every chapter Mather's excellence as a teacher comes through loud and clear to convince the reader that the earth is a dynamic, living planet.

Recent college texts in general geology are characterized by excellent photographic illustrations—the late William C. Putnam's *Geology* comes first to mind—and, among books for the layman, John Shimer's *This Sculptured Earth* holds high rank. But one need leaf through only a few pages of *The Earth Beneath Us* to see that this book about the earth stands at the top as far as excellence of illustrations is concerned. There are 240 photographic illustrations, 116 of them in color, and most are full- or half-page (page size is 8½ by 11 inches). Infinite care has gone into the selection of the photographs, and many of them are superb, not only because of composition embodying the highest pictorial and esthetic qualities but also for the clarity and vividness with which they depict geologic features and the operation of the processes that create these features. Among the contributing photographers are such names as Joseph Muench, Andreas Feiniger, Emil Schultess, Robert Clemenz, and others of like caliber. Chanticleer Press is to be commended for the splendid handling of the color engravings.

Fully half the book consists of photographic illustrations. The colored plates are numbered and are referred to in the text. Unfortunately

the black-and-white photographs are unnumbered and no reference is made to them. This shortcoming, however, is partly compensated for by placement of each illustration at or close to the part of the text to which it relates. Some of the illustrations show prominent geologic features not mentioned in the captions—for example, the picture (p. 139) of shoreline cliffs. No reference is made in the caption to the beautiful development of sea arches and stacks that are shown in this photograph.

The illustrations for the chapter on groundwater are almost exclusively of cave interiors and deposits made by hot springs. A few photographs of karst topography, especially aerial views, would have contributed greater variety and made the coverage more nearly complete.

The arrangement of the 15 chapters is patterned pretty much after that of several well-known general geology texts. The first three chapters set the stage for the remainder of the book, which deals largely with the sculpting of the landscape by the various geological processes.

Chapter 1, "Getting acquainted with the earth," briefly introduces the obvious external and internal forces that shape the landscape. Chapter 2, "The earth in time and space," sets forth the relation of the earth to the galaxy and solar system and describes the interior of the earth. Chapter 3, "The rocks at the earth's surface," discusses the materials—igneous, sedimentary, and metamorphic rocks—on which the geologic processes act. The next 11 chapters run the gamut from weathering through wind action, streams, shore processes, glaciers, groundwater, mass movements, volcanism, and earthquakes to the making of mountains. In these chapters Mather frequently emphasizes the effect that geologic processes and features have on man. In a final chapter, "Man and the earth," he deals with the effect that man has on the earth—the impact of agriculture on erosion, alteration of the landscape by dams and reservoirs, reshaping the shore, reclaiming submerged land, and so on.

Chapter 5, "Where the winds blow," chapter 11, "Landslides, avalanches, and mudflows," chapter 12, "In the realm of Vulcan," and chapter 13, "When the earth trembles," will evoke strong interest because they provide vivid accounts of spectacular natural events.

At a time when many a great aqueduct brings water hundreds of miles over and through mountain ranges and across the plains to thirsty acres and cities, when tourism is one of the most important industries in many states and countries, and when we and other peoples are casting about for remaining bits of nature's handiwork to preserve and protect, an intelligent layman can hardly afford not to read this book.

And it is quite possible that a number of geologists, when they see the book, will say, "I wish that I had done something like this."

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Biochemistry and Disease

Biochemical Disorders in Human Disease. R. H. S. Thompson and E. J. King, Eds. Academic Press, New York, ed. 2, 1964. xx + 1066 pp. Illus. $22.

The first edition of this book (1957) filled a substantial need for an up-to-date work on those disease entities that exhibit significant biochemical aspects. Since then other books have appeared, particularly books that deal with inherited metabolic diseases. However, the explosive growth of knowledge in this field makes most welcome this second edition of *Biochemical Disorders in Human Disease*, edited by R. H. S. Thompson and the late E. J. King. It is gratifying to report that the excellent coverage of the subjects considered in the first edition has been maintained. In addition four new chapters have been introduced: (i) on the chemical anatomy of the human body (by R. Passmore and M. H. Draper); (ii) on the pancreas (by Henry T. Howat); (iii) on atherosclerosis (by G. S. Boyd); and (iv) on protein anomalies of the lymphoreticular system (by N. H. Martin). Our knowledge of this latter subject has been significantly enhanced by the application of modern physicochemical technics, and inclusion of the chapter is most appropriate.

Although a certain amount of material on fundamental biochemical concepts must be incorporated in a book so closely related to intermediary metabolism, there is the danger that material readily available in standard textbooks will nonetheless be included in presentations which should be confined largely to the biochemical applications to disease. In this second edition, it appears that only the essential and normal biochemical concepts are treated, with emphasis on those newly discovered pathways which have been elucidated in the last several years. There has also been an effort to confine the discussion of a given topic to the most recent advances. For example, in the chapter on nutritional disorders, a detailed account of the classical vitamin-deficiency diseases has been omitted in favor of the more timely topics, insofar as current research is concerned, of obesity and kwashiorkor and recent studies on starvation and appetite.

In each chapter, one gets the distinct impression that revision has been extensive and that the coverage of each topic is thorough and in accord with the modern literature. Repetitious coverage, so frequently an irritation in books to which several authors have contributed, is commendably rare. All of this has not been accomplished without increasing the size of the book (by roughly 200 pages). Nonetheless, it is a noteworthy achievement, and this work should serve as a most satisfying reference source for the reader who seeks an authoritative review and bibliography of any of the topics that are treated.

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Informal Lectures

Real Numbers. Stefan Drobot. Prentice-Hall, Englewood Cliffs, N.J., 1964. x + 102 pp. Illus. $3.95.

This book is based on a series of "rather informal talks on real numbers" given by Drobot to high school teachers attending summer institutes at the University of Notre Dame. The range of topics covered in less than 100 pages of text is indicated by the four chapter headings: "The concept of real numbers"; "Digital representations of real numbers"; "Approximations of real numbers by rationals"; and "Cardinality and measure."

The author has been remarkably successful in presenting a development of some of the most important aspects of the real numbers in a self-contained