Book Reviews

Principles of Geochemistry. Brian Mason. New York: Wiley; London: Chapman & Hall, 1952. 276 pp. $5.00.

Nowadays, one who would write of geochemistry must be prepared to touch upon questions of astrophysics and cosmochemistry, upon what may be termed the protochemistry and the paleochemistry of the developing earth, with its several supposed zones and its aqueous and atmospheric envelopes. In addition, he must treat the chemistry of the mineral constituents of the earth's crust and the physical chemistry of the mineral assemblages, including the changes they suffer under changing environments. This necessarily involves questions of their interaction with each other and with the constituents of the atmosphere and the hydrosphere. In treating these, he cannot neglect certain aspects of biochemistry—for some rocks are the direct result of life processes and others are strongly affected by them. Even though he may nominally confine himself to principles, he must present a far-from-inconsiderable amount of factual data. In short, he sets himself a task of no mean magnitude. Yet in a text of only 254 pages Mason has accomplished this task with astonishing success.

In opening each question he usually offers at least a glimpse of its historical development and proceeds to a statement of the present state of knowledge. When some aspects are in doubt he makes this fact and the basis of doubt clear, as well as indicating the additional data necessary to resolve it. Each chapter ends with a list of references, for each of which a brief résumé of content is given.

The author exhibits almost unnatural restraint. Most authors, including this reviewer, manage to refer to their own writings as often as is reasonably possible, but the name Mason does not appear in the index of the book, although the author has made significant contributions to crystal chemistry and geochemistry.

All in all, it is an excellent book—a model of incisive, authoritative, and lucid scientific writing.

NORMAN L. BOWEN
Geophysical Laboratory
Carnegie Institution of Washington

Smithsonian Logarithmic Tables to Base e and Base 10. Smithsonian Misc. Coll., Vol. 118, Pub. 4054. Compiled by George W. Spenceley, Rheba M. Spenceley, and Eugene R. Epperson. Washington, D. C.: Smithsonian Institution, 1952. 402 pp. $4.50.

These tables are an adaptation of Hoüel's factorization method of computing logarithms to many places. Tables I and II give the natural and common logarithm to 23 decimal places of $XXXX$, 1.0^3 $XXXX$, and 1.0^7 $XXXX$, the range of $XXXX$ being from 1 to 10,000.

The natural logarithm of N is found as follows: N is expressed in the form $N = ABCDE$, where A consists of the number $XXXX$ formed by the first four digits of N; B, C, and D are numbers of the form 1.0^3 $YYYY$, 1.0^7 $ZZZZ$, 1.0^{11} $WWWW$, respectively; and E is the power of 10 necessary to make A a four-digit number without decimal point. The tables give $\ln A$, $\ln B$, $\ln C$; $\ln E$ is found by inspection; $\ln D$, from the approximate relation $\ln (1+x) \approx x - (x^2/2)$; and $\ln N = \ln A + \ldots + \ln E$. The error in the 23rd place of $\ln N$ does not exceed 0.5. Common logarithms are found similarly. Antilogarithms are found readily by the inverse of the process outlined above.

The tables are well bound in a convenient desk size ($9'' \times 6''$) and are easy to read and use. Those who have either occasional or frequent use for logarithms that are accurate to many places will find the tables a welcome addition to the literature—particularly since, for the first time, logarithms are given to 23 places in a concise manner.

The book under review is an extension of certain work done by the senior author in conection with the preparation of the *Smithsonian Elliptic Functions Tables* (1947). All the calculations made to produce the tables were done by hand or on hand desk calculators having 10 columns of 10 keys. This is unusual in these days when large-scale digital engines are commonly used for computing tables. It is indeed an inspiration to know of the painstaking scholarship and the devotion on the part of the authors and their assistants that have gone into the successful preparation of these new tables. Miami University, the Smithsonian Institution, and the Research Corporation of New York are to be commended for their part in helping to make possible the publication of this excellent work.

RICHARD S. BURINGTON
Bureau of Ordnance, Department of the Navy

Electrical Measurements. Forest K. Harris. New York: Wiley; London: Chapman & Hall, 1952. 784 pp. $8.00.

This book is intended for the student of electrical engineering or of physics, who thus has some acquaintance with the theory of electricity and of electric circuits and a background of mathematics through the calculus. Since the author gives a rather thorough discussion of the topics he covers, he limits the content to direct-current and low-frequency measurements. In particular, the range of topics includes general theory of measurement and electrical units, d-c galvanometers, d-c ammeters and voltmeters, potentiometers, resistance measurements, ballistic galvanometers, magnetic testing, a-c ammeters and voltmeters, power and energy measurements, instrument transformers, waveform and frequency measurements, and a-c bridges.

The author assumes that the student using the book will have a truly professional interest in electricity, that he will not be content to accept without question

the uncorrected indication of any instrument that comes to hand, but that he will want to understand the theory and operation and thus be able to make a critical analysis of the accuracy of any set of measurements. The topics listed above are discussed in a manner consistent with this viewpoint, including a description of each instrument, the history of its development, types of measurements for which it is used, the mathematical theory applicable to its various uses, description of the physical behavior under various operating conditions, definition of constants characterizing the instrument, discussion of sensitivity, stability, and the parameters influencing performance, characteristics of the commonly available commercial forms of the instrument, and factors involved in selecting the best type for a given job. The book is not a laboratory manual, however, and does not contain directions for specific experiments. Nevertheless, the instructor can readily devise his own experiments from the information given about the performance, calibration, and checking of instruments and bridges.

V. A. JOHNSON
Department of Physics, Purdue University

A Colored Atlas of Some Vertebrates from Ceylon: Fishes, Vol. I. Ceylon National Museums Pub. P. E. P. Deraniyagala. Colombo: Ceylon Govt. Press, 1952. 149 pp. and 34 color plates.

This nicely bound, black-covered volume with gold lettering measures 10½ by 12½ inches. Although it may have been intended for students of general natural history, this atlas has features that make it a work on systematic ichthyology. All the colored illustrations were prepared by the author "from living specimens and a few from freshly killed ones." Some are so intensely colored with brilliant ink that, in many instances, details are lost in the reproduction process, resulting in an unnatural appearance.

The atlas "deals with all the strictly freshwater fishes of the Island and a few marine families, [and] the scientific, local, and popular names of each species are given in the text." Among those illustrated in color, 18 are marine species.

The text consists of keys to families, genera, and species. A page is devoted to the zoogeography of Ceylon, 4 to fossil fishes (mostly teeth), and the remainder to descriptions and observations concerning the 129 species of recent fishes treated. The 60 text figures are more carefully done than the somewhat diagrammatic color plates.

From the point of view of a specialist working in systematic ichthyology, this atlas has some shortcomings. There is evidence that the author has not made extensive comparisons of the fish fauna of Ceylon with that of other related areas and, as a result, has not come to the correct conclusions in regard to certain names used. For example, he refers to *Gymnothorax fimbriatus* as a subspecies of *G. undulatus,* whereas both are distinct species. In his "schematic fish" showing external characters, and how measured, the "standard length, caudal peduncle, head [length] and origin of first dorsal" are not defined as currently used in ichthyology. There is one new ordinal name—Mastocembeli. Two new subspecies were named: *Labeo porcellus lankae* was established loosely as regards present-day standards, since it "differs from the 'forma typica' in its smaller size," whereas *Anabas testudineus kavaiya* "differs from the forma typica in showing some specimens with XV [spines]," yet no statistical tables comparing *Anabas testudineus testudineus* with the new subspecies are given.

The author points out that the fresh-water fish fauna of Ceylon was derived mostly from India, was later isolated, and that some of the species have differentiated into subspecies or full species.

Ceylon is within the tropical Indo-Pacific marine fish faunal area, the world's largest marine fish zone. The "most southerly outpost of India with several thousands of miles of ocean separating it from the nearest land masses to its east, south, and west, it is a way-station past which oceanic species, rare and unknown in Indian waters, travel periodically."

In the references to literature, 41 titles of articles by the author are given. These will be useful to students interested in the zoology of Ceylon, as will the atlas.

LEONARD P. SCHULTZ
U. S. National Museum, Washington, D. C.

Scientific Book Register

Fouriersynthese von Kristallen und ihre Anwendung in der Chemie. Werner Nowacki. Basel: Verlag Birkhäuser, 1952. 237 pp. and *Tabellen zur Bestimmung der 120 Auslöschungseinheiten.* 30.15 Sw. fr.; 34.30 Sw. fr., bound.

Metallurgy for Engineers: Casting, Welding, and Working. John Wulff, Howard F. Taylor, and Amos J. Shaler. New York: Wiley; London: Chapman & Hall, 1952. 624 pp. $6.75.

Trattato di Malattie Infettive, Vols. I and II. (In Italian.) E. Carlinfanti and F. Magrassi, Eds. Naples: Edizioni Scientifiche Italiane, 1951. 2446 pp.

The Scientific Papers of James Clerk Maxwell. Repr. W. D. Niven, Ed. New York: Dover Pub., 1952. 1488 pp. $10.00.

The Advance to Social Medicine. René Sand; R. W. Parnell, Ed.; Eng. trans. by Rita Bradshaw. New York–London: Staples Press, 1952. 655 pp. $8.50.

Principles of Chemistry. 6th ed. Joel H. Hildebrand and Richard E. Powell. New York: Macmillan, 1952. 444 pp. $4.50. (Bound with 3rd ed. of *Reference Book of Inorganic Chemistry,* $7.50.)

Backgrounds of Human Fertility in Puerto Rico: A Sociological Survey. Paul K. Hatt. Princeton, N. J.: Princeton Univ. Press, 1952. 512 pp. $5.00.

Corrosion Testing Procedures. F. A. Champion. New York: Wiley, 1952. 369 pp. $6.25.

The Auricular Arrhythmias. Myron Prinzmetal *et al.* Springfield, Ill.: Thomas, 1952. 387 pp. $16.50.

The United States Public Health Service 1798–1950. Ralph Chester Williams. Bethesda, Md.: Commissioned Officers Association of the U. S. Public Health Service, 1951. 890 pp. $7.50.