cupied, an opening bracket or parenthesis should be placed in front of the continuation. Here it is indicated every which way: On page 98, left column, line 16, a bracket is used; on the same page and column, line 20 (from the bottom), a vertical line is used; on the same page and column, line 9 (from the bottom), nothing is used; while on page 283, right column, line 8, a rather ingenious device resembling a bent arrow is used.

In thoroughness, accuracy, and typography the Carpovich dictionary does not compare with Callaham's.

M. HOSEH
Science Translation Program,
National Library of Medicine

Multilingual Aid

Geographical Conversion Tables. D. H. K. Amiran and A. P. Schick, Eds. Published for the International Geographical Union by Aschmann and Scheller, Zurich, 1961 (order from Stechert-Hafner, New York; $6). xxix + 539 pp.

This work was initiated, essentially, in the summer of 1952 when the Seventeenth International Geographical Congress, meeting in Washington, D.C., appointed a special committee to evaluate the need for a volume of geographical conversion tables. The special committee reported its findings to the Eighteenth International Geographical Congress held in Rio de Janeiro in 1956. The upshot was approval for the preparation and publication of such a volume.

Many persons, too numerous to mention here, provided aid, encouragement, and critical direction to the arduous undertaking, but the major travail fell upon the shoulders of the editors, D. H. K. Amiran and A. P. Schick of the Department of Geography of the Hebrew University of Jerusalem, and the actual compilation of the material was done in that department. Preparation costs were met by Ford Foundation subsidy, and publication-cost grants were made by the National Science Foundation (U.S.), by UNESCO, and by the International Geographical Union.

In a strict sense, one reports on, rather than reviews, a work of this nature. There are over 300 pages of tables in the volume. These deal with a host of items, such as conversion from fathoms to meters, from acres to square feet, from metric tons to short tons, from bushels per acre to kilograms per hectare, and from percent of slope to degrees of slope, as well as conversion from inches of mercury to millibars, from time in hours, minutes, and seconds to radians, from horsepower to kilowatts, from degrees Fahrenheit to degrees Celsius, and so on. Included, also, are tables on sunrise, sunset, and sunlight duration and, along other lines, the comparison of weights of bags, sacks, bales, and barrels of various types of commodities from one country to another. There are even graphs of walking travel time and motoring travel time (per distance)—and a world time-zone map.

The materials in the volume are presented in English, French, German, Russian, and Spanish—the increased international, perhaps one should say virtually world-wide, utility of the work is obvious. Several professional geographers have checked the materials in terms of the five "language-expressions" just noted.

To all of those, especially the editors, responsible for this volume, this "reporter" tips his hat. They have sacrificed precious research and other time for the production of a needed and extremely useful book. Their own personal rewards may have to "come in Heaven," but in the meantime, many on earth will profit from their labors.

In somewhat parenthetical conclusion, it should be pointed out that the title of the volume is partially misleading—for the materials, the "conversion tables," certainly are of interest and utility beyond the "geographical" field.

ROBERT M. GLENDINNING
Department of Geography,
University of California, Los Angeles

Brief Treatment

Introduction to College Geology. Chauncey D. Holmes. Macmillan, New York, ed. 2, 1962. xx + 483 pp. Illus. $7.

In the preface to this edition, the author says that the text is "designed for use in college courses carrying five or six semester hours credit," that it combines and coordinates physical and historical geology, and that it has been revised "in keeping with the many new developments of the past decade." In my opinion, no one of these admirable aims has been realized.

Whether a text is suitable for college use depends, to be sure, on a lot of factors, not the least of which is the instructor. I think that this book belongs at the high school level, or perhaps it could be used for the geology part of an earth-science requirement in college. For one thing, the content (483 pages) is less than half that commonly used for a full college course. But more important than bulk, the spirit of the book is repeatedly revealed in simple statements of fact, completely without trace of quantification in the physical part, and without a hint that any problem exists in the problem-riddled field of historical geology. With negligible exceptions, not a geologist, no matter how famous, is mentioned; there are no references, no footnotes, and no bibliography. That the student is expected only to memorize may be seen from typical chapter-end questions: "Name the eight most abundant elements present in Earth's crust." "Name in their proper sequence the periods of the Mesozoic era." "What is an earthquake? Seismology?"

I see no sign of integration of physical and historical geology; chapters in the two fields have simply been intermixed. The first hundred pages have to do with the earth as a planet and with rocks and minerals. Then there are several historical chapters, 230 pages long. The last 130 pages are physical geology again: shorelines, earthquakes, erosion, groundwater, winds, petroleum, and (again) minerals. There is no more than the usual cross reference between the physical and historical sections; they stand or fall by themselves.

The book has not kept up with the "many new developments" that interest me. In an admittedly hasty reading, and in the index, I have found nothing on the following: evolution, ecology, graywackes, tectonism, lithofacies, or eugeosynclines. Turbidity currents are there—two paragraphs of them—and geosynclines occupy five. And glaring though these omissions may be, I cannot understand how Pleistocene glacial history can be treated without some reference to deep-sea cores and to oxygen-18. Migration, extinction, Gondwanaland, and palynology are missing, though there is a brief mention of pollen (not in the index). Paleomagnetism (not named) takes one sentence; isotopes are not listed, although radiocarbon occupies a page. The word "time" is not in the index, and one would not expect to find time-stratigraphic, nor even facies.

With all its limitations, is the book

an interesting one: does it have a new or lively approach?

I must have read too many geology texts. Or perhaps one becomes hypercritical toward the end of an academic year, for the book has furnished me neither instruction nor interest. As to the latter, however, only you should be the judge. Remember, the instructor may shine by contrast!

LINCOLN DRYDEN
Department of Geology,
Bryn Mawr College

A Working Manual

Comprehensive Analytical Chemistry. vol. 1c, *Classical Analysis.* Gravimetric and titrimetric determination of the elements. Cecil L. Wilson and David W. Wilson, Eds. Elsevier, Amsterdam, 1962 (order from Van Nostrand, Princeton, N.J.). x + 728 pp. Illus. $24.

This is the final part of volume 1 of the treatise; in all, five volumes are planned. Parts 1a and 1b dealt with general gravimetric and titrimetric analysis; part 1c gives gravimetric and titrimetric methods for each element, with references to other methods, such as absorptiometric or radiometric methods, where appropriate. Within its prescribed limits, the book certainly merits the "comprehensive" used in its title.

In the preface the editors "reiterate [their] aim . . . that *Comprehensive Analytical Chemistry* should be a *working* manual, offering as far as possible direct and immediate assistance." For each element a short review is given of its occurrence and general analytical characteristics; this is followed by a discussion of sample preparation, separation, and determination. Then selected procedures for separation and determination are given in sufficient detail for the reader to use the book directly at the laboratory bench.

The treatment of each element or group has its own bibliography, and in general each reference is followed by a descriptive sentence. The book is therefore an excellent starting point for literature searches. There is a good subject index, but no author index.

Very occasionally the text reads like a review in *Analytical Chemistry*, but it goes far beyond a mere list of references. The merits of different methods are critically discussed, and the 30 authors (seven are American, the others British) draw on their own experiences for their recommendations. Methods such as ethylenediaminetetraacetic acid titration, precipitation from homogeneous solution, solvent extraction, and ion exchange are used freely but with critical evaluation. However, beginning with the first part of the book, the discussion of alkali metals, I was puzzled to find no mention of zirconium phosphate-type ion exchangers for separating rubidium and cesium and other elements in the alkali and alkaline earth groups. Then I looked at the bibliography that follows this section and found only one reference dated later than 1955.

In general the literature is well covered through 1954 and 1955, but no later. (The section on cobalt is an exception.) Thus, there is no mention of the Schöniger combustion technique for elementary analysis of organic compounds, though space is given to other, now antiquated, methods.

I know something of the difficulties of producing a cooperative work of this kind, and the editors are not to be envied. Nevertheless, it is a pity that so long a time seems to have elapsed between the preparation of the manuscripts and the publication of the volume.

HAROLD F. WALTON
Department of Chemistry,
University of Colorado

Inside the "Black Boxes"

Introduction to Chemical Instrumentation. Edward J. Bair. McGraw-Hill, New York, 1962. viii + 349 pp. Illus. $10.75.

This new approach to chemical instrumentation will be a valuable addition to the book shelves of many scientists. In the past, existing commercial instruments have been described by treating them as "black boxes" and giving explicit instructions for their operations. Very little attention has been given to what is inside—that is, to how information is taken from the sample, converted to an electrical signal, sorted, analyzed, and then displayed in some sensible form. Up to now there has likewise been no book on electronics which is directed toward chemical applications. As a useful supplement to books on electronics and chemical instrumentation, Bair's book will be of especial use to scientists who must design their own chemical instruments and to those who must extend the use of existing instruments.

A knowledge of electronics, although helpful, is not required. Bair has included a chapter on electronic parts which serves as an introduction to a description of the elementary circuits or electronic components. These components are then treated as units in block diagrams. Thereafter the emphasis is placed on the flow of signals through block diagrams rather than on electronics.

Many helpful hints and instructions are given for the design and construction of new chemical instruments.

JOHN A. BORNMANN
Department of Chemistry,
Northern Illinois University

Nuclear Reactors

Heavy Water Exponential Experiments Using ThO_2 and UO_2. J. A. Thie. Pergamon, New York, 1961. 170 pp. Illus. $6.

Heavy water exponential experiments using uranium and thorium oxide fuels are discussed in this book's 11 chapters: (i) introduction; (ii) exponential method; (iii and iv) Scandinavian UO_2-D_2O lattice experiments and the interpretation of results; (v and vi) Saclay UO_2-D_2O lattice experiments and interpretation; (vii and viii) Savannah UO_2-D_2O lattice experiments and interpretation; (ix) Argonne UO_2-ThO_2-D_2O lattices; (x) theoretical interpretation of UO_2-ThO_2-D_2O lattices; and (xi) considerations in planning exponentials. Four appendices deal with symbols and units, counting corrections and statistics, a method for interpolation in moderator to fuel ratio dependent bucklings, and a list of nuclear properties of UO_2, ThO_2, Al, and D_2O.

This book treats the experimental arrangements and outlines the theoretical treatment of the data obtained. That the material has been drawn from a variety of laboratories is evident from the chapter headings. The experimental arrangements are reported in considerable detail, and Thie includes the lattice geometry with all the reported buckling information (something that other writers often fail to do). The book does not consist solely of a factual report of data, but a comparison and an interpretation of the different procedures of various laboratories are also made.