free from the scrappy disjointedness that so often characterizes the results of publishers' overeagerness to rush into print *any* collection of papers presented at *any* meeting. No doubt this coherence is a reflection of the care used in selecting those who were invited to participate, but there is no doubt that much of the coherence also springs from the clear outline of the problems which is given in the rather long preface and from the skill with which the editor has arranged the papers.

The book is well printed and reasonably, though not completely, free of typographical errors. The photographs are particularly well reproduced. The book can be warmly recommended to a wide audience of physical chemists and biologists as a good summary of the considerable progress that has been made in this important interdisciplinary subject.

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Comprehensive and Balanced

International Symposium on Mining Research. vols. 1 and 2. George B. Clark, Ed. Pergamon, New York, 1962. 871 pp. Illus. $30 per set.

These volumes, which reflect the proceedings at an international symposium on mining research, held at Rolla, Missouri, in February 1961, consist of 50 papers. The symposium was the most comprehensive ever attempted in its field and included participants from Austria, Czechoslovakia, France, Germany, India, Japan, Sweden, the United Kingdom, the United States, and the U.S.S.R. Subjects treated include the fields of blasting (23 papers), drilling (2), rock mechanics (9), ground support (3), safety and health (2), mineral identification (3), sampling (3), drill-steel behavior (3), gyrosurveying (1), and pipeline transportation of solids (1). The subjects reflect a judicious balance of theory, laboratory tests, and field determinations. Although some of the articles have appeared (in whole or in part) elsewhere, there is enough new material of merit to make the book valuable to persons interested in the fields mentioned above, if they are willing to pay a rather high price.

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Initial Instruction

An Introduction to Physical Oceanography. William S. Von Arx. Addison-Wesley, Reading, Mass., 1962. x + 422 pp. Illus. $15.

William Von Arx quotes a statement made in 1725 by Count Marsigli, saying that many scientists were dissuaded from a study of the sea by the complexity of its problems. These are still difficult, but fortunately there have been many who see in them a fascination and a challenge and who are prepared to accept the difficult and uncontrolled nature of the environment with which they work. This is established in the introductory chapter and an appendix which take the student from Greek beginnings through to the last decade in a useful survey of the more notable contributions to geophysics. These appear to increase exponentially with time, in common with other sciences.

In these days it appears that oceanographers must needs be specialists in one of the basic disciplines, but it is of some importance that they have an understanding of other fields than their own. A theoretical hydrodynamicist is not in general likely to regard biology as a useful element in his theories, whilst it is quite conceivable that the physical oceanographer would be aided by a study of biological factors.

The author has for many years been on the staff of Woods Hole Oceanographic Institution and is also professor of oceanography at Massachusetts Institute of Technology. He should be in a strong position to assess the needs of students. The result is a book in which the fluid mechanics of the oceans—advective and convective processes, tides, and the dynamics of the Gulf Stream—are interspersed in roughly equal proportions with a discussion of the environment—the properties of seawater, the stratification of the oceans, the earth's rotation, and its geology. Physical argument is used in the main, and mathematical formulas are at a minimum (this is not always an advantage).

Many of the topics treated are left tantalizingly "in the air." This may well leave some readers with only a hazy idea of the principles and methods of oceanography, but it should stimulate the serious and intelligent student to further enquiry, aided by the study questions and many references at the end of each chapter. The author's own interests are to the fore in a perhaps over-detailed discussion of electromagnetic methods of measuring currents and in an excellent chapter on laboratory models of ocean circulation (of which the author was a pioneer). Comments on such practical problems as how to find out where one is, with reasonable accuracy, in the middle of an ocean are a welcome feature.

I believe that Von Arx has been successful in producing not a textbook but a true *introduction* to oceanography. It only remains to say that unfortunately the price of the book makes it quite possible that it will not reach a well-deserved place on the shelves of many of the students for whom it is intended.

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Not Recommended

Russian-English Chemical Dictionary. Eugene A. Carpovich and Vera A. Carpovich. Technical Dictionaries, New York 31, 1961. 352 pp. $14.

To do justice to a dictionary, it should be evaluated only after it has been used for some time. This procedure, however, is not practical if the appearance of the book is to be announced promptly. The best that can be done under such circumstances is to look for randomly selected words. In such a search of this book, I found that the following words are missing: газопоглотитель, золотник, капуста (as used in coking), каптаж, каракатица, люфт, нуль, прядево, рухляк, смерзаемость, and сноп. The words: величина, держатель, пилюля, роданистый, сернокислый, сернова-тистый, соприкосновение, and others appear only in phrases, not separately. The Russian нутч-фильтр is preferably translated *suction filter*. The English *vehicle-motor gasoline* (page 10) and *food flank* (page 35) are obviously erroneous. However, no dictionary is perfect, and each one has its advantages. Whatever the advantages of this dictionary, they are not to be found in its typography and makeup. The makeup of the English text is sloppy. Nothing is gained by omitting periods in abbreviations, and much clarity is lost thereby. Abbreviations are best put in italics. In this dictionary they are so indicated on page 5, but nowhere else in the body of the dictionary. When a word or phrase is continued on another line otherwise oc-

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.

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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.

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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