agent. Here the author gives deserved attention both to verbal communication with patients and to signals conveyed by the doctor's behavior, his manner of speech, and his "ahh" and "ohh." The remainder of the book, notwithstanding its medical slant, is devoted to matters important to all in the scientific professions who must speak or write for publication.

The helpful advice for public speakers concerns not only oral presentation but also the commonly used physical aids. Ten pages are devoted to slides alone—their makeup and showing. Anyone who has suffered from viewing slides overcrowded with data will appreciate the stress the author lays on this common fault, pointed up by an illustration of "an overcrowded slide resembling a page from a railway timetable" (actually a timetable showing 28 stations and their train times in 19 columns). The chapters on writing offer excellent discussions of "the pursuit of clear English," faults of writing and how to avoid them, and the mechanics of preparing a manuscript and illustrations. The author, an English physician, sustains the reputation of his countrymen for lucid writing, and gentle humor enlivens the pages. In a section on multiple authorship, he suggests to department heads who insist on routine inclusion of their names in by-lines that "this way of achieving reputation should disappear."

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Chemical Reactions

Reagents for Organic Synthesis. LOUIS F. FIESER and MARY FIESER. Wiley, New York, 1967. 1469 pp., illus. $27.50.

Reagents for Organic Synthesis is well on the way to becoming the reference book of choice for everyone concerned with techniques of synthesis in organic chemistry. The reasons for this are easy to identify. First of all, there is a great need for additional guidance to the vast literature of organic synthesis. In spite of the availability of extensive abstracting and title-listing publications, the task of locating a suitable method for carrying out some particular transformation can be exceedingly difficult. This is especially true with substrates that possess some complicating characteristic, such as a high degree of steric hindrance, an especially sensitive functional group, or even some unusual solubility properties. In these circumstances, if one can recall an analogous problem that has already been solved the task is made very much easier. Of course, the lack of emphasis on synthesis in much contemporary teaching of both undergraduate and graduate courses in organic chemistry contributes to the difficulties. This lack is particularly regrettable, since a strong synthetic background would enrich the currently favored areas of molecular spectroscopy, structural theory, and reaction mechanisms. In the meantime, the number of chemists with a large and critical knowledge of useful reactions is both small and decreasing. The present volume provides a most convenient way in which to ease the search for half-remembered techniques or to uncover methods previously unknown to the reader.

Of course, an equally important reason for the success of this undertaking is the well-known talent of the authors for writing and compiling. The Fiesers have devoted a significant portion of their lives to the study of organic chemistry and its literature and have been in close contact with many of the most active organic chemists all over the world. There are very few chemists with a comparable background, and fewer still who have had the energy and devotion to transmit their knowledge in book form. This breadth of experience has resulted in the production of a book which is at once personal in flavor and catholic in scope.

The book presents an alphabetical list of "reagents," along with much valuable information on their commercial sources, physical properties, preparation, and uses. Small comments of practical significance abound. The documentation is impressive. Most important, the Fiesers have interpreted their task so broadly as to have compiled a treatise on organic-chemical methodology rather than a mere index. It is, of course, unusual to find organic synthesis organized in dictionary form. The result of this kind of arrangement is a book full of fascinating juxtapositions, and one which rewards the browser in the same way a good dictionary does. This volume will serve chemists well for many years to come.

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Medieval Astronomy

Ibn al-Muthannâ's Commentary on the Astronomical Tables of al-Khwârizmî. Two Hebrew versions, edited and translated, with an astronomical commentary, by BERNARD R. GOLDSTEIN. Yale University Press, New Haven, Conn., 1967. 418 pp., illus. $17.50.

The unique role of Arabic culture in the history of the Western world is nowhere more evident than in the story of the descent of science from the ancient Middle East to the quickened activities of Renaissance Europe. This is a story not too well known, though specialists have been sketching its development for at least a half century.

From the 9th to the 13th centuries Muslim Spain provided a meeting ground for Latin and Semitic learning. Here, where the two cultures touched and intermingled, facilitated by the intermediary scholarship of Christian and orthodox Jew, historians have located the bridges of continuity, not only linking the achievements of antique Babylon and Greece to the growth of modern science, but even uncovering connections with ancient India. The vehicle of such enterprise is invariably humanistic—surviving texts and commentaries, such as these before us, and their analysis. To this task the scholar must bring not only the traditional linguistic and historical skills but a full understanding of the science involved. This Goldstein has done in the translation of Ibn al-Muthannâ's Hebrew commentary on the no-longer-extant astronomical tables of the 9th-century astronomer al-Khwârizmî. In its alloy of Greek and Hindu astronomical methods, the text illustrates clearly the transit of Hindu astronomy to the West.

Operating from the two Hebrew versions of the text (both of which are translated into English in this volume) Goldstein directly elucidates its meaning and character. Though he succeeds thus in clarifying the contents of the work, his all-too-sparse introduction (nine pages in a volume of over 400) unfortunately does little to set the material on which he has labored so well into a full historical perspective. A broader essay on Islamic astronomy, even if it were limited to the relevant epoch alone, would have been very welcome indeed.

The relative paucity of such scholarship as we have here at hand has pre-

vented us from constructing an acceptable history of medieval science. Goldstein provides us with a remarkably well-cut stone for the task, but we are still in need of someone to erect the temple.

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Sun and Earth

Solar-Terrestrial Physics. Papers from the Inter-Union Symposium, Belgrade, Aug.–Sept. 1966. J. W. KING and W. S. NEWMAN, Eds. Academic Press, New York, 1967. 402 pp., illus. $16.50.

This book contains the ten invited review papers given at the Inter-Union symposium on solar-terrestrial physics in Belgrade. Five topics were discussed at the symposium, and there were two review papers pertaining to each topic.

The first paper (by Lüst) gives a good description of the observed properties of the interplanetary gas and magnetic field and of the ways in which the observations are made. Together with the next paper (by Parker) it deals with the solar aspects of the solar-terrestrial relationship. These two chapters of the book may be recommended as an appropriate introduction for anyone who wants to familiarize himself with the solar-wind phenomenon.

The next two papers treat the observations (Ness) and the theory (Dungey) of the earth's magnetosphere under quiet solar conditions. There is some overlap with the subjects treated by Lüst and by Ness, but this hardly detracts from the book.

One of the longest chapters (by Obayashi, 60 pages) is devoted to the magnetosphere and its response to increased solar activity. Parts of what is discussed in the first section of the article have already been treated by Lüst in his chapter. The other two sections, on disturbances in the earth's upper atmosphere and on disturbances in the magnetosphere, give a comprehensive description of the phenomena. They also furnish a discussion of origins of the disturbances, including treatments of particle precipitation and of ionospheric current systems.

The very worthwhile task of trying to arrive at "an understanding and a coherent summary" of the interrelations of all the observed charged particles in the magnetosphere has been well coped with (by O'Brien) in the next chapter of the book. The characteristics of auroral radiations, Van Allen belts, the magnetosheath, and the solar wind are here related. The following long chapter (by Troitskaya, 60 pages) treats micropulsations of the earth's magnetic field, and shows how investigations of this subject can also give information about the phenomena caused by the interaction of the solar wind with the magnetosphere. In a short, well-conceived article Krassovsky discusses auroras. He distinguishes between ordinary auroras, caused by the injection of low-energy particles, and red auroras, associated with intense heating of the atmosphere by hydromagnetic waves.

The final chapters consist of an article (by Evans) on ground-based measurements and one (by Gringau) on rocket and satellite measurements of the temperature of the particles in the ionosphere and in other parts of the atmosphere. It is of interest to have the two methods juxtaposed, and it shows to some extent the inherent strengths and weaknesses of both.

A book written by a number of authors will necessarily omit aspects that other scientists in the field would like to see included. Similarly, some repetition and overlap can hardly be avoided. The present book suffers from both of these drawbacks, but—in the reviewer's judgment—not to such a degree that its value is significantly diminished. It can be recommended to all who want to delve into this fascinating inter-field that has so often been ignored—particularly by astronomers.

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Books Received

The Adaptations of Organisms. Rodolfo Ruibal, Ed. Dickenson, Belmont, Calif., 1967. x + 110 pp., illus. Text ed., $2.25; trade ed., $3. Dickenson Series on Contemporary Thought in Biological Science.

Advances in High Temperature Chemistry. Vol. 1. Leroy Eyring, Ed. Academic Press, New York, 1967. xiv + 334 pp., illus. $14.50.

The Agricultural Research Service. Ernest G. Moore. Praeger, New York, 1967. xii + 244 pp., illus. $5.95. Praeger Library of U.S. Government Departments and Agencies.

American Space Exploration. The First Decade. William Shelton. Little, Brown, Boston, 1967. xii + 367 pp., illus. $5.95.

The Americanization of the Unconscious. John R. Seeley. International Science Press (distributed by Lippincott, Philadelphia), New York, 1967. viii + 456 pp. $8.95.

Analytical and Numerical Methods of Celestial Mechanics. G. A. Chebotarev. Translated from the Russian edition (Moscow, 1965) by Scripta Technica. Ludwig Oster, Translation Ed. Elsevier, New York, 1967. xviii + 331 pp., illus. $17.50. Modern Analytic and Computational Methods in Science and Mathematics, 9.

Ancient Medicine. Selected Papers of Ludwig Edelstein. Owsei Temkin and C. Lilian Temkin, Eds. Translated from the German by C. Lilian Temkin. Johns Hopkins Press, Baltimore, 1967. xiv + 496 pp. $12.50.

Annual Review of Genetics. Vol. 1. Herschel L. Roman, Laurence M. Sandler, and Gunther S. Stent, Eds. Annual Reviews, Palo Alto, Calif., 1967. xii + 334 pp., illus. $8.50.

Antibiotics. Origin, Nature and Properties. Tadeusz Korzybski, Zuzanna Kowszyk-Gindifer, and Włodzimierz Kurylowicz. Translated from the Polish by Edwin Paryski. Pergamon, New York; Polish Scientific Publishers, Warsaw, 1967. Vol. 1 (xx + 1144 pp., illus.); vol. 2 (xviii + 406 pp., illus.). $45.

Approximate Methods for Solution of Differential and Integral Equations. S. G. Mikhlin and K. L. Smolitskiy. Translated from the Russian edition (Moscow, 1965) by Scripta Technica. Robert E. Kalaba, Translation Ed. Elsevier, New York, 1967. xii + 308 pp., illus. $14.

Archaeological Discoveries in the Holy Land. Compiled by the Archaeological Institute of America. Crowell, New York, 1967. xvi + 220 pp., illus. $12.50.

Arithmetic for Science Students. Programmed Discussion. Jay A. Young. Prentice-Hall, Englewood Cliffs, N.J., 1968. vi + 106 pp., illus. Paper, $1.56.

Aromatic Amine Oxides. Eiji Ochiai. Translated from the Japanese by Dorothy U. Mizoguchi. Elsevier, New York, 1967. x + 456 pp., illus. $30.

Aromatic Rearrangements. Henry J. Shine. Elsevier, New York, 1967. x + 405 pp., illus. $23.50. Reaction Mechanisms in Organic Chemistry Monograph 6.

Atlas of African Prehistory. Compiled by J. Desmond Clark. Maps by Eve Kemnitzer. University of Chicago Press, Chicago, 1967. 12 maps and 38 overlays, boxed, with explanatory booklet (64 pp., illus.). $32.

Australian Aboriginal Portraits. Charles P. Mountford. Melbourne University Press, Melbourne, Australia; Cambridge University Press, New York, 1967. 89 pp., illus. $11.50.

Background to Evolution in Africa. Proceedings of the symposium "Systematic Investigation of the African Later Tertiary and Quaternary," Burg Wartenstein, Austria, July–August 1965. Walter W. Bishop and J. Desmond Clark, Eds. University of Chicago Press, Chicago, 1967. x + 935 pp., illus. $27.50.

(Continued on page 124)