Book Reviews

Atomic Energy for Your Business. Today's key to tomorrow's profit. Arnold Kramish and Eugene M. Zuckert. McKay, New York, 1956. 269 pp. + plates. $3.95.

The great industrial increase in interest in nuclear applications since the Atomic Energy Act of 1954 became law has resulted in the need for informed guidance available to those business leaders who must make the decisions relative to their company's participation in the field. The present book aims at providing such information. One of the authors, a previous member of the Atomic Energy Commission as well as Assistant Secretary of the Air Force, and now acting as a business consultant in the atomic field, has a rich background for such an objective.

After a brief introduction discussing the typical questions which any nontechnical business executive would naturally raise respecting the future of nuclear energy, the authors devote the next three chapters to a very brief historical review and a few very simple physical concepts about the atom and nucleus. A long chapter on applications to industrial processes is followed by a discussion of the political scene in which the nuclear developments have been nurtured. Next, a discussion of atomic developments abroad is followed by specific suggestions and recommendations to be followed by business leaders who desire actively to associate their businesses in this rapidly advancing field of activity.

In various places throughout the book, references are made to the retarding effect upon the program which has resulted from the carrying over of wartime military security into a field where it was too often assumed that the United States held some important "secrets." This has created a wholly new psychology in the United States' mind, and only slowly are we beginning to realize how far into the sands our heads have been buried. Military-weapon design has, of course, always been involved in secrecy, in all countries, but it took the great technologic advance of nuclear fission to becloud our ability to distinguish between fundamental science and engineering design. The authors clearly bring out this country's indebtedness to various European laboratories for the basic science upon which our wartime engineering development was built.

Certain sections of the political discussions are somewhat colored by the obvious party affiliations of the authors. It is also to be regretted that the contributions of other commissioners who were not directly associated with one of the present authors could not have been evaluated along with those who are included in the discussion.

The book also has a rather long technical appendix, which will probably prove too elementary for a technologist, and by virtue of its being set aside from the general context of the book, the average businessman may unfortunately assume it to be too complex for his perusal. It had better have been included in the proper sections of the text, since it is not of a technical nature which cannot be grasped by any intelligent person. A table of present reactors in the U.S. Power Reactor Program, a dictionary of atomic energy, a section of selected reference material, and a list of the industrial members of the Atomic Industrial Forum constitute the remaining appendixes.

The book should be a useful guide to those busy executives who desire to obtain a brief background in the industrial future of nuclear energy.

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Automatic Digital Calculators. Andrew D. Booth and Kathleen H. V. Booth. Academic Press, New York; Butterworths, London; ed. 2, 1956. 261 pp. Illus. $6.

This second edition of *Automatic Digital Calculators* has a very useful bibliography of the computer field, more than twice as long as that in the first edition, published only 2½ years earlier. This tremendous activity in the computer field really requires a larger book than the present one to do it justice.

Automatic Digital Calculators is written on a slightly more technical level than Bowden's *Faster Than Thought* but does not go into enough of the technical details to be particularly useful to the practicing computer engineer. Its 17 chapters, comprising only 234 pages, tend to give mere glimpses of the complexities of the field. For example, chapter 16, on program design, is mainly taken up with a program for interpolation, giving the reader little feeling for the vast complexity and sophistication in programming now possible. There is little or no mention of Boolean algebra, of information theory, or of the possibilities of digital machines for automation or control purposes.

The book does provide a readable, though faintly archaic, introduction to the field. It gives a little history; a bird's-eye view of the field as a whole; simple discussions of many basic circuits, components, and techniques; and more than a glimpse of the minutiae required to formulate mathematical problems as sets of orders that the machine can follow.

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Diseases of the Skin. Richard L. Sutton, Jr. Mosby, St. Louis, Mo., ed. 11, 1956. 1479 pp., 1972 illus. $29.50.

The 11th edition of this standard atlas and encyclopedia of skin disorders surpasses the preceding volumes that have been the lifework of the author and his late father. Brevity, the use of small type for discussions, and an unconventional style of documentation have enabled Richard Sutton, Jr., to present more dermatologic knowledge in less space than was required in the previous edition. By using abbreviated references in the body of the text, he has been able to continue the Suttons' policy of mentioning practically everything of importance in the increasing dermatologic literature.

After receiving my medical education, I completed the courses in the curriculum of the George Washington University School of Law. I found that the citations used in legal writing are much handier than the footnotes used in medical literature. The practicability of shorter references in scientific reports was discussed in this journal in 1954 and 1955 [*Science* **120**, 150, 1038; **122**, 108]. Sutton, Jr., has demonstrated that a telegraphic type of documentation is practical in medical writing. He has done well at this stage to retain the figure for the year in each reference, inasmuch as physicians are less accustomed than lawyers to library research and do not associate volume numbers with date of publication.

In the preface, the author's analysis

of how he describes a disease will be helpful to those who want to write adequate and readable descriptions of medical entities. The chapter on therapy emphasizes the need for detailed instruction of patients and for a definite order to discontinue all previous medications. The sections on contact dermatitis, the medicolegal aspects of occupational dermatoses, and the treatment of dermatitis venenata are particularly well done. Especially instructive is a hypothetical case presentation that sets forth in detail an interview in which the nature of the dermatitic process is explained to the patient and the latter's cooperation is enlisted in ferreting out the contact irritant.

Insofar as possible, the former dermatological classification based on type of cutaneous manifestation has been replaced by one based on causative agent. The coverage of metabolic skin diseases is six times as extensive as that in the initial printing of the tenth edition in 1939. The doubling of space devoted to embryology of the skin accords with the interest manifested in this subject at the annual meetings of the American Academy of Dermatology and Syphilology in December 1956.

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Beiträge zur Geschichte der Erkenntnis des Erdmagnetismus. Heinz Balmer. Sauerländer, Aarau, Switzerland, 1956. 892 pp. Illus. DM. 30.

Even before starting his studies at the University of Berne, Switzerland, the author was interested in old scientific illustrations and in biographies of scientists. He selected geography as his major field, the history of Switzerland and physics as his minor fields. A first version of the present book was accepted in 1953 as his Ph.D. thesis.

In the first part of the book (pp. 27–230), the author presents highlights of writings on terrestrial magnetism, starting with selected items from Chinese writings of about 2000 years ago and ending with publications of about 100 years ago. In this section he includes a discussion of the history of technical terms and instruments related to terrestrial magnetism—for example, magnets, the compass and the directions marked on it, and magnetic declination and inclination. The last 16 pages of this section contain historical information related to observations of changes in the direction of the magnetic needle in space and time and to suspected effects of auroras and of oxygen in the atmosphere.

In the second part of the book (pp. 231–520), the author gives extensive selections from writings by Galilei, Mercator, Kepler, William Gilbert, A. von Humboldt, and others. He uses German translations if the originals are in a different language. The third section (pp. 521–579) deals with three special subjects: the myth of the magnetic mountain; ideas which, at the time of Galilei, foreshadowed the magnetic telegraph; and publications on terrestrial magnetism written in Switzerland between about 1500 and 1850. This section includes historic information on sundials. Finally, the author gives a detailed bibliography and biographies of persons mentioned in the text. An author index and a subject index conclude the book.

This book is recommended reading for anyone interested in the history of natural sciences. The 45 illustrations include reproductions of old cuts showing magnetic instruments, especially compasses, and old maps related to problems of terrestrial magnetism—for example, a map by von Humboldt indicating the earth's magnetic field for 1600, 1700, 1800, and 1830, and one by Halley for 1702. Frequently the author includes short discussions of problems which are only distantly related to terrestrial magnetism. Extensive parts of the book are of greater interest to historians than to students of terrestrial magnetism. For example, the author points out that Columbus, on his first voyage, realized, from comparing the direction given by the compass with that obtained from star observations, that they show a difference which changes gradually between Europe and the West Indies; on his second voyage he used this information to determine the approximate position of his ships. On the other hand, of interest to students of terrestrial magnetism are detailed reports on the changes of the earth's magnetic field in course of time, and historic information on attempts to locate the magnetic poles.

The book contains a large amount of historical information, but no modern concepts are discussed. Although probably few will want to read it from cover to cover, everyone interested in the history of science will find interesting sections in it. Typography and reproduction of figures are good.

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Progress in Cosmic Ray Physics. vol. III. J. G. Wilson, Ed. North-Holland, Amsterdam; Interscience, New York, 1956. 420 pp. Illus. $10.50.

The study of cosmic rays has advanced so rapidly in the last decade that it has become impossible even for the specialist to keep up with the many papers published in physics journals in various countries. Also the subject of cosmic rays has now been subdivided into many specialized aspects, some of them dealing with the nuclear physics problems of high-energy particles, some with the origin of cosmic rays and their distribution near the earth and in the universe. Inevitably this has involved an ever-increasing group of physicists in the cosmic-ray field,—on the one hand, nuclear physicists working on new types of elementary particles with high-energy accelerators, and, on the other hand, astrophysicists and astronomers who are concerned about the phenomena that occur in the atmosphere of stars and in the interstellar space where acceleration of cosmic rays probably takes place.

The need has therefore been great for review articles which summarize the current state of knowledge in a certain field of cosmic-ray investigations. Under the capable editorship of J. G. Wilson of the University of Leeds, several volumes have been published containing contributions by outstanding specialists which summarize the state of research in their field. The present volume, the third in this series, contains four chapters. K. Greisen of Cornell University discusses experiments, their interpretation, and the theory of the so-called "extensive air showers," phenomena which are produced by cosmic rays of extremely high energies, between 10^{14} and 10^{18} electron volts. In complicated nuclear and electromagnetic interactions the original particle produces at lower altitudes in the atmosphere often millions of secondary particles which will hit the earth like a shower over an area of about 100 yards' radius; hence, the name.

The second chapter, written by H. S. Bridge of Massachusetts Institute of Technology, summarizes present knowledge of unstable elementary particles with mass between the electron and the proton (the mesons) and with mass greater than that of the proton (the hyperons). These particles are all produced in high-energy nuclear interactions of cosmic rays, either with atoms in the atmosphere or, in this case, with atoms in photographic plates which are used to detect these events. It is thought that the problem of nuclear forces is closely tied up with the nature of these particles.

The third chapter by R. W. Thompson of Indiana University discusses yet another group of unstable particles observed in cosmic radiation, namely, those carrying no charge. They too play an important part in the theory of nuclear forces.

The last chapter by G. Puppi of the University of Bologna considers the problem of cosmic rays in the atmosphere and investigates what happens to the cosmic-ray energy which enters at the top of the atmosphere. Puppi shows that a certain fraction of the energy goes to