student, home-owner, nurseryman, landscape architect, and professional arborist.

General maintenance practices are brought up-to-date in part 1. Topics such as soil, transplanting, fertilizers, pruning, treatment of wounds and cavities, and bracing are adequately covered. Major revisions have been made in the chapter on trees suitable for various locations; tall-growing trees are given only passing attention, and more emphasis is placed on low-growing trees suitable for use about low, modern homes and also for streetside plantings.

Specific abnormalities of trees are discussed in part 2. Three main chapters deal with the diseases and insect pests that attack low-growing, tall-growing, and evergreen trees. Each group of trees is arranged in alphabetical order according to the common names. The diseases are presented in logical order—symptoms, cause, and control. Next each insect pest is identified by a description of its damage to the tree and a brief description of the various stages of development. The description is followed by a discussion of appropriate control measures. New diseases and insect pests and the latest methods of controlling them are included.

A new topic is presented in the appendix, which should appeal to professional workers. It is a method for evaluating shade trees from a monetary standpoint adopted by the National Shade Tree Conference and the National Arborist Association in 1957. This is followed by a 19-page, selected bibliography that is especially useful to the student.

Pirone has successfully presented his subject in a manner midway between the technical and the popular levels of presentation.

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Radiation Hygiene Handbook. Hanson Blatz, Ed. McGraw-Hill, New York, 1959. 926 pp. Illus. $27.50.

Hanson Blatz writes in the preface of this *Handbook* that it is the first comprehensive handbook in the field that they chose to call "radiation hygiene" and that the handbook has been dependent upon the contributions, advice, and inspiration of many of the American leaders in this "relatively new branch of science."

The new description of the field as "radiation hygiene" seems very opportune and is a good substitute for the less apt term "health physics" which, if we consider the meaning of "physic," seems at times to be somewhat more appropriate to the field of patent medicines. Disappointingly, however, the information in the handbook seems sometimes to be insufficiently up-to-date to do justice to the newness of this "relatively new branch of science," but this is probably due to the delays that are inevitable in publishing a large and comprehensive work. It is, however, somewhat incongruous to find 102 pages devoted to nuclear data tables "based principally on the work of J. M. Hollander, I. Perlman and G. T. Seaborg" which appeared in *Reviews of Modern Physics* in April 1953 when a very full and complete revision of that work appeared in the same journal in April 1958. Nor is any reference made to the intervening encyclopedic publications of the Nuclear Data Group of the National Research Council (K. Way, C. L. McGinnis, *et al.*).

In the table on fundamental constants in the section entitled "Reference data," it is curious to find the "rutherford," which was stillborn some 9 or 10 years ago. In passing, one might question the validity of including quantities such as the roentgen and curie (and even millicurie and microcurie) as *fundamental constants* along with Avogadro's number, Planck's constant, and the velocity of light.

Apart, however, from the shortcomings of which the foregoing are examples (doubtless they are due to the time elapsed between setting pencil to paper and the ink drying on the printed page), this volume contains a wealth of information in its 23 sections which range from "Exposure standards and radiation protection regulations" through "Interaction of radiation with matter" and "Radiation attenuation data" to "Liquid and solid waste disposal" and "Personnel control." Sections are also devoted to sources of radiation (including natural and artificially induced radioactivity, particle accelerators, and reactors), radiation detection and measurements, and applications to industry, research and medicine. Each section of the book is contributed by an authority in his field.

One omission is, however, noteworthy. In the descriptions of counting equipment much space is devoted to how counters operate but none at all, as far as I can determine, to how to use them. Thus, references are made to the efficiency of counters and formulas are quoted which include efficiency terms, but no clue to the determination of efficiencies is given, nor, indeed, is any difference drawn between geometric and intrinsic efficiency. Such efficiencies are normally determined by the use of radioactivity standards, but a careful search of the subject index and of the most likely parts of the text reveals not one single reference to radioactivity standardization. This is a topic that might well have merited a section of its own, when one considers how the older field of health physics depended so much on radioactive metrology.

That this new and interesting book will be of great value cannot be doubted, and it will be a most valuable asset for any radiation laboratory. It may, however, be of more use to the experienced radiation hygienist, who already knows his way around the field, than to the beginner. There is much that will be of value to the beginner, and the book is stimulating enough to make one look forward to the second edition which could well prove to be a much needed work of authority for all workers, both inexperienced and experienced, in radiation hygiene.

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J. M. Charcot, 1825–1893, His Life—His Work. Georges Guillain. Edited and translated by Pearce Bailey. Hoeber, New York, 1959. 202 pp. + plates. $7.

This is a pleasant little book with a Gallic flavor that is maintained in the translation and with a binding that attracts the eye and hand. How nice to see a little gilt filigree on a cover again.

This is the first English biography of Jean-Martin Charcot, father of modern clinical neurology and one of the medical luminaries of the 19th century. Charcot belongs to that select group of clinicians who have advanced medicine through meticulous, persevering observations of patients throughout the course of their illness and on to autopsy.

Charcot was fortunate in his environment. His work was his life, and he was not disturbed in his pursuits. A proud Parisian, he made the collection of human discards at Salpêtrière his

rich museum and laboratory. This led to his descriptions of neurologic syndromes that will be retained in medicine until clarification of their etiologies; even then, Charcot's name will be indelibly part of their recognition.

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Indians of the High Plains. From the prehistoric period to the coming of Europeans. George E. Hyde. University of Oklahoma Press, Norman, 1959. xiii + 233 pp. Illus. $4.

George Hyde has undertaken the formidable and challenging task of presenting a "coherent picture" of the Indian occupancy of the western plains prior to the year 1800. Mainly, the story is one of the Plains Apache who dominated the central and southern plains from about 1500 to 1700, and of the Comanche and Shoshone ("Snakes") who overran much of the central and northern plains during the 18th century. The data utilized come largely from historical documents, buttressed here and there by archeological evidence turned up in the past quarter century. Three maps and 14 plates (the latter including two particularly interesting mid-18th century deerskin paintings believed to relate to the contemporary Plains Indians) supplement the text.

The author has assembled an impressive body of data, much of it from obscure sources which present-day students too often overlook or neglect in their piecemeal treatment of certain segments of the larger problem. Steeped in years of thinking and reading, Hyde has earned the gratitude of his readers for his region-wide interpretations and for compiling a plausible reconstruction of human activity against which future findings and interpretations can be compared. The end result of his labors makes entertaining reading for anyone dogged enough to stay with the book through its mass of detail and frequent shifts of locale.

The preface describes this as "a reading book, not a treatise"; hence the author disavows a need for the careful documentation that should characterize any scholarly work and which readers have come to expect in this "Civilization of the American Indian Series," of which this is the 54th volume. More serious is the author's penchant, where direct documentation or other supporting evidence is lacking, for suggesting a tentative identification or interpretation and, thereafter, for handling these suggestions as established facts. Because many of the documents for this period are decidedly sketchy and vague and because they frequently use tribal designations which are not readily correlated with the better documented groups of later periods, other interpretations than those set forth still merit serious consideration. Sharp reactions to many of Hyde's views must be anticipated.

Despite these and other shortcomings—a certain archeological naiveté, and the need for healthy skepticism on the part of the reader—Hyde's book should have a place on the shelf of anyone seriously interested in the early historic Indians of the western plains.

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Report on the State of Machine Translation in the United States. Yehoshua Bar Hillel. Technical Report No. 1. Prepared for the U.S. Office of Naval Research, Information Systems Branch, Jerusalem, Israel, 1959 (available as PB151746 from Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D.C.). 48 pp. + appendixes. $2.25.

This critique is a sobering evaluation of the many misconceptions engendered by overly optimistic approaches to fully automatic, high-quality machine translation (FAHQMT). It is based upon the author's visits in late 1958 to most of the 12 major mechanical translation (MT) centers in the United States, discussions with members of the two British centers, and a study of the principal publications of all these centers.

It recommends that fully automatic, high-quality machine translation be renounced and that future practical research be concentrated on either fully automatic, low-quality translation or partly automatic, high-quality translation; it further recommends that basic research into language structure, models, and so forth be divorced from immediate applicability to mechanical translation. Ten proposals for the organization of further research and for the improvement of cooperation are made.

The appendixes include copies of two papers, presented before international conferences, on the theoretical limitations of FAHQMT and an original paper entitled "A demonstration of the non-feasibility of fully-automatic high-quality machine translation."

Speculating on the author's dim view of the possible success of mechanical translation, one might point out that it is easy to construct hypothetical phrases (as the author has done) which cannot be translated by any conceivable machine; this is so easy, in fact, that much of what is written is unintentionally untranslatable, either by machine or human being. If a passage isn't meaningful and unambiguous in the original language, then attempts to translate it into something meaningful are not even a proper activity. In such cases one is tempted to rewrite the passage, and if this is done, it should be recognized that it is not a translation, but the work of a new author. The point here is that since, to a degree, the benefits of mechanical translation are denied us by the machine's intolerance of sloppy communication, we should be more precise in our writing, and if necessary develop a language that permits the necessary degree of precision and nonambiguity.

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Elements of Solid State Theory. Gregory H. Wannier. Cambridge University Press, New York, 1959. 269 pp. $6.50.

In this volume, Wannier presents us with a readable and cogent account of a considerable segment of modern, solid-state theory. The volume is limited to a size which will not discourage a reader seeking a cultural acquaintance with the subject. It is, however, a book for the physicist, and most topics are discussed at a high level of sophistication.

Two of the early chapters (chapters 3 and 4) have a special value for they treat topics which have only recently attained prominence in the literature of physics and which are therefore not treated in the familiar textbooks. Chapter 3 is devoted to lattice dynamics and includes a discussion of topological aspects of the distribution of the vibrational frequencies of crystals. The recognition of the influence of special points on the form of the frequency