on this topic that has appeared during the past twenty-five years.

After a brief treatment of the historical aspects of our treatment of American forests, including an outline of natural forest regions and the regions of present commercial saw timber, Dr. Boerker plunges into a consideration of the manifold relationships of forest products to the nation in time of peace and war. The importance of forests in our recreational program is given appropriate treatment, and we learn that about 45,000,000 acres of forest land will be needed by all types of recreation in the future. The relation of forests to wild life, water supply, erosion, soil conservation and flood control are treated in several special chapters and are referred to in many other places throughout the text. It is good to note that the results of rather recent researches are reflected in the discussion of these and many other topics. Reference is made to the still lingering differences that exist among the experts regarding many of the natural relationships of forests. In this connection the author stresses the wisdom of the old Chinese belief that "the mightiest rivers are cradled in the needles of the pine trees."

The discussion of lumber and its by-products includes reference to some of the newer synthetic and fabricated materials that have become of great commercial value. The importance of the forest as a livestock range is indicated by the statement that of the 600,000,000 acres that are classified as forest land in the United States over one half is used for grazing purposes. Forty per cent. of all the mature range cattle in the western states graze on forest lands for at least a part of the year. Many of our most fundamental economic and social problems as well as numerous controversial scientific attitudes are involved in the relationships between forests and livestock. The conflict between federal and private management of such resources is still a live topic in the West.

Some of the most impressive sections of this excellent book are those that present an introduction to the destroying agents of fire, fungi and insects to which forests are constantly exposed. The terribly destructive influence of these factors, especially of fire, have now become fairly familiar to many reading Americans. That insect enemies of the forest take a toll of $100,000,000 a year can scarcely be sensed by the average American, however, or that a single species of parasitic fungus could practically wipe out one of our most important hardwood trees in less than fifty years. The findings of the forest entomologists and forest pathologists admirably illustrate the scientific complications of modern forestry, and indeed of conservation of natural resources in general.

The author properly devotes considerable space in special chapters to the consideration of the leadership of the federal government in American forestry. Numerous other references to this well-known and significant feature recalls a former book, "Our American Forests," that Dr. Boerker published in 1918. And the controversies that still hound American forestry over the question as to public versus private management of our forest resources are also touched. The author is quite objective and impartial in the presentation of most of his material, but on this question, after a passing reference to the differences of opinion, he clearly indicates that his own attitude is to favor increasing governmental control and management of such important and nationwide matters.

The role of the various states in forest restoration and the forestry problems that are peculiar to the various sections of the nation are topics of special chapters, as are the special economic and social factors involved in private forestry. This extremely attractive book is concluded with a good index.

Dr. Boerker's new book is thoroughly documented and reliable, and the University of North Carolina Press has done an excellent job of manufacturing the volume. It can be warmly and confidently recommended to every American, old and young, who is seriously interested in the future welfare of his nation. It will serve as an admirable guide for any group or class that wishes to undertake a special study of forest conservation.

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EBULLIOMETRIC MEASUREMENTS

Ebulliometric Measurements. By W. SWIETOSLAWSKI, professor in absentia of physical chemistry of the Institute of Technology, Warsaw; senior fellow, Mellon Institute of Industrial Research. xi + 228 pp., 64 figs. Reinhold Publishing Corporation, New York, N. Y., 1945. $4.00.

IN 1936 an English edition of "Ebulliometry" was published in Cracow, and in 1937 a photolithotyped edition with supplements appeared in the United States. The latter has been rewritten and new developments have been included to form this new edition. The book is a unique source of authoritative and concise information on modern ebulliometric methods, most of which have been developed by the author or under his direction. The description of experimental technique and the illustrations of apparatus are of such clarity and detail that it can serve as a laboratory manual as well as a text of principles and a handbook of valuable information, data and references. The advantages, in simplicity, convenience and precision, of the method of comparative measurements are explained and emphasized throughout the

monograph. Primary and secondary standards and their requisite properties for comparative ebulliometric measurements are discussed.

Among the ebulliometers described are:

An improved simple ebulliometer for the precise determination of boiling points and changes in barometric pressure.

The differential type, with and without fractionating columns between thermometer wells, for comparing boiling and condensation temperatures, testing for purity, determining molecular weights, measuring solubilities and constructing diagrams of boiling point plotted with respect to composition of mixtures.

An ebulliometer for mixtures containing small amounts of highly volatile components.

One for measuring condensation temperatures of vapors before and after passing through a rectifying column.

A multi-stage ebulliometer with four thermometer wells to measure boiling points and condensation temperatures at several points along a column.

Ebulliometers for systems having two-liquid phases.

A universal ebulliometer composed of interchangeable standardized units of specified dimensions provided with ground joints of standard taper. This is a particularly desirable innovation, since with these parts it is possible to construct quickly any of several types of ebulliometers.

Modifications for the application of electrical heating and redesigned thermometer wells for use with ordinary Beckmann thermometers are illustrated.

Some idea and appreciation of the variety of the topics and applications described can be gained from the following captions of the eighteen chapters: ebulliometric measurements; classification of liquid mixtures; method of comparative measurements; calibration of thermometers and measuring of changes in pressure; determination of the degree of purity of liquid substances; applications of ebulliometers to the study of azeotropy; purification of liquid substances and microebulliometric determination of impurity content; microebulliometric determination of moisture content; microebulliometric determinations of impurity content in solid substances; ebulliometric examination of thermal resistivity (resistivity here refers to resistance to decomposition); microebulliometric determination of the amount of vapors adsorbed by solid substances; macroebulliometric determination of moisture; molecular weight determination of solid substances; boiling and condensation phenomena observed under high pressure; ebulliometric measurements under high pressure; determination of the solubility of solid substances; ebulliometric method of determination of equilibrium constants; ebulliometric examination of physicochemical standards. A postscript, a numbered bibliography of references, author index and subject index close the volume.

The printing is good and the illustrations are clear, which could not be said of the previous edition. Very few errors were noted and these are minor and obvious. This new edition should prove even more popular and useful than the previous one. It should be included in the library of every chemist and physicist connected with industrial distillation, research on the physical properties of pure liquids and solutions or teaching physical chemistry.

EDGAR REYNOLDS SMITH

INFINITE SERIES

Infinite Series. By J. M. HYSLOP. xi + 120 pp. New York: Interscience Publishers, Inc. 1942. $1.75.

THIS book furnishes an excellent account of the fundamental features in the convergence theory of real series. Some space is allotted to the discussion of complex series and infinite products. Also, a chapter is devoted to the more important properties of double series.

The book is intended for the student who wishes to acquire a good working knowledge of the theory of infinite series after acquiring a grasp of the fundamentals of elementary analysis. Some of the theory concerning functions and limits that might not be presupposed in this case is given in the first two chapters.

In view of the steadily increasing use of summability theory in current works dealing with infinite series and their applications, it seems to the reviewer that it would have been worth while to have touched on this field, as the simpler phases of it are no more difficult than other topics treated in the book. In particular, since there is a chapter on the multiplication of series, Cesàro methods and their application to this problem might well have been discussed at that point.

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BOOKS RECEIVED

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