

Die Oekologie der Pflanzen. By DR. OSCAR DRUDE. Band 50, Die Wissenschaft Sammlung von Eingeldarstellungen aus den Gebieten der Naturwissenschaft und der von Friedr. Vieweg & Sohn. 1913. Pp. Technik. Braunschweig, Druck und Verlag viii + 308, with 80 figures in the text.

Not since the publication of Warming's "Oecology of Plants" in English in 1909 has a general work on the ecology of plants appeared. Professor Drude comes well-equipped for the presentation of the subject by years of study and travel in Germany, Great Britain and the United States. A student of Grisebach's, one of the earliest and greatest of plant geographers, Dr. Drude has seen the rise and progress of plant geography and ecology, and his first chapter on physiognomic growth forms of plants in which a historic review of ecology is given is written from personal acquaintance with the prime movers in the new department of botanic science. The first one hundred pages deal with the physiognomic life forms of plants. Beginning with page 31, a classification of these forms is given with numerous figures and reference to illustrative plants. Some of the groups considered are Monocotyledonous Crown Trees, Tree Ferns and Cycads, Dicotyledonous Woody Lianes, Grass Trees, Dicotyledonous Stem Succulents, Perennial Grasses, Dicotyledonous Cushion Plants, Geophilous Bulbous Plants, Saprophytes and Parasites. Altogether Drude recognized 54 growth forms, grouped under the heads of Aërophytes, Aquatic Plants and Cellular Plants (mosses and thallophytes), etc. Following the general consideration of each group, notes are given for purposes of further study and cross reference and bibliographic details are cited. Illumination illustrations and additions end this instructive chapter.

The second chapter deals with climatic influences, periodicity of vegetation and leaf characters. The topics treated in this chapter describe the physiognomic effect and organization of the leaf and the physiologic questions of plant nutrition. Here the author deals with the duration of the leaf, bud formation and protection, light and leaves, transpiration,

etc. Under climatic periodicity, the author gives a geographic division of the climatic zones, recognizing 18 climatic groups. Phenology and other problems of climatic influence are considered in detail in this chapter.

The third chapter is concerned with physiographic ecology. The ecologist must deal with the difficult problem of why species unite into certain communities and why they have the physiognomy which they possess? The author treats of the edaphic influences of soil, ground water, bacteriologic soil content and the influence of lime and acids. He quotes Jaccard's law on the distribution of species in the alpine meadows and pastures, and deals with the much discussed question of association and formation. The last section of this chapter deals with thirteen vegetation types, viz., hydrophytes, helophytes, oxylophytes, halophytes, lithophytes, psychrophytes, psammophytes, eremophytes, chersophytes, psilophytes, sclerophytes, conifers and mesophytes.

The fourth chapter, and last one, is devoted to matters of evolutionary interest and is headed ecologic epharmony and phylogeny. In several sections, phylogeny and growth forms, eurychory and stenochory, correlation, epharmony, mutation and heredity are considered. Additional notes and a bibliography complete the volume.

Altogether, ecologists, the world over, will be indebted to Professor Drude for a lucid exposition of the important principles of that department of botanic science denominated ecology. He has presented much that is entirely new, and he has made over into a different form much that is old. The whole book shows a thorough grasp of the entire subject of plant ecology, which the author has been able to digest and assimilate and present in an attractive and useful form to the student world. The figures are good and many of them new, representing typic species, some of them grown in the Dresden Botanic Garden.

JOHN W. HARSHBERGER

UNIVERSITY OF PENNSYLVANIA

A Treatise on Quantitative Inorganic Analysis. By J. W. MELLOR, D.Sc. Philadelphia, J. B. Lippincott & Co.

This excellent work is Volume 1 of a treatise in the ceramic and silicate industries by the same author. The processes used are those used in the testing department of the County Pottery Laboratory, Staffordshire, for the analysis of clay, bricks, glazes, enamels, refractories, and for the coloring materials and minerals used in ceramics.

The book is divided into five parts with an historical introduction of ten pages.

Part I., containing 140 pages, takes up rather exhaustively the following chapters: I. Weighing, 25 pages; II. The Measurement of Volumes, 17 pages; III. Volumetric Analysis, 37 pages; IV. Colorimetry and Turbidity, 5 pages; V. Filtration and Washing, 23 pages; VI. Heating and Drying, 10 pages; VII. Pulverization and Grinding, 7 pages; VIII. Sampling, 14 pages; IX. The Reagents, 11 pages.

Part II., containing 98 pages takes up carefully and in detail the analyses of clays and other silicates. The accuracy obtainable is illustrated by tables giving the results of actual analyses of silicates showing the variations to be expected for each determination. The methods used are practically those used by the U. S. Geological Survey somewhat shortened.

Part III., containing 121 pages, takes up the analysis of glass, glazes, enamels and colors, including the determination of arsenic, antimony, tin, lead, bismuth, mercury, copper, cadmium, zinc, manganese, cobalt and nickel.

Part IV., 128 pages, describes special methods for the determination of the following: molybdenum, tungsten, niobium, tantalum, gold, selenium, aluminum, beryllium, iron, chromium, vanadium, uranium, zirconium, thorium, the rare earths, barium, strontium, calcium, magnesium and the alkalis.

Part V., containing 111 pages, describes special methods for the acids and non-metals, carbon, boron, oxide, water, phosphorus, sulfur, the halogens, and the rational analysis of clays.

Finally the Appendix contains 55 pages of analytical tables, etc.

This work is just what its title indicates, "A Treatise on Quantitative Inorganic Analy-

sis," written more especially with the needs of the ceramic chemist in view. It is profusely illustrated with photographs, drawings and graphs, and the bibliography given in the footnotes is quite complete.

The methods given are perhaps somewhat unnecessarily long for the technical chemist, but this is on the safe side and the chemist can shorten the methods to suit himself. Dr. Mellor has left out gas and fuel analyses on the ground that there are so many books specializing in these subjects.

The book is a very helpful addition to the library of the analytical chemist, particularly because it keeps in view always the analysis of the kind of things the chemist has actually to analyze and not merely pure salts. It will be invaluable to the ceramic chemist.

Dr. Mellor is to be congratulated on the completion of this work.

D. J. DEMOREST

THE COLLEGE CURRICULUM

PRESIDENT MEIKLEJOHN, of Amherst College, in his recent annual report, makes some interesting contributions to the discussion of the college curriculum. In the first place, he shows it to be an unfounded rumor that Amherst has become distinctly a "classical" school, to the neglect of the sciences. Dean Ferry's statistics of student registration, published last year in *SCIENCE*, give Amherst a median position among the New England colleges, both in science and in the classics, as well as in English and other modern languages, and a low position only in the "humanistic sciences," including history, economics and philosophy. It is true that Amherst has abandoned the B.S. degree, but this was done partly because that degree attracted a lower grade of students and was regarded as inferior to the Arts degree and easier to obtain, and partly for the purpose of simplifying the mechanism of a prescribed curriculum, to which policy Amherst is now committed. For the last few years, its curriculum has been largely prescribed and has demanded much concentration upon "majors." The plan has been found defective in one respect, since