In the descriptive portion, extending over 215 pages, the classification of minerals according to elements is followed. The mineral descriptions are generally adequate, although native copper is disposed of in about one half page and with but four lines devoted to the Lake Superior occurrence. The statistics relating to the production of minerals are for 1910.

This edition of von Kobell's mineralogy of only 405 pages is much more comprehensive than any other text on the subject of similar compass. The authors are to be congratulated upon the clear and concise manner in which this wealth of material has been presented.

EDWARD H. KRAUS
MINERALOGICAL LABORATORY,
UNIVERSITY OF MICHIGAN

Outlines of Theoretical Chemistry. By FREDERICK H. GETMAN, Ph.D. John Wiley & Sons. 1913. Pp. ix + 467.

This book is written primarily for the use of students beginning the study of physical chemistry. It is always interesting to have the viewpoint of a new author in such an extended field as modern physical chemistry. The array of facts and theories in the recent literature of physical chemistry is so vast that necessarily each teacher must be content to select what he considers to be the most important principles and of need neglect others. Dr. Getman has chosen to chapter and classify nineteen lines of discussion. After discussing briefly the atomic theory and the periodic law, the conventional fields of physical chemistry are devoloped historically in most cases. This historical treatment is carefully handled for the most part, the tendency being throughout the book to treat the subjects considered from the viewpoint of the original investigators. While this treatment is excellent in most cases, a little more personality injected would clear certain points. For example, the chapter on Electrons can not give the student anything more than a very vague idea of the subject. On the other hand, the subjects of Thermochemistry, Equilibrium, Electromotive Force and Actinochemistry are very clearly and satisfactorily handled.

The addition of a series of well-selected problems at the end of each chapter is to be highly commended.

While the press work of the book is of the same high quality as that of Wiley & Sons' text-books, it is to be regretted that the cost to the student is as much as $3.50.

VICTOR LENHER

BOTANICAL NOTES

SMALL'S MANUALS

DR. J. K. SMALL, of the New York Botanical Garden, has been very industrious in the preparation of systematic manuals of botany as shown by his "Flora of the Southeastern United States," now in its second edition, his "Flora of Miami," "Florida Trees," both of which appeared during 1913, and now we have a "Flora of Lancaster County" (Penn.) in collaboration with the late J. E. Carter. The first-named books were noticed in these columns when they appeared, and it remains only to notice the last. While the Florida manuals dealt with a *terra incognita,* the Flora of Lancaster County deals with a region which "has been the scene of almost continuous botanical exploration and study for nearly a century and a half." In fact the work was begun by Muhlenberg in the latter part of the eighteenth century. Somewhat more than forty years ago Professor T. C. Porter published an enumeration of the indigenous and naturalized plants of the county, and this has formed "the basis of the present flora."

The book includes about 350 pages, and is an actual descriptive manual, and not a series of keys. In other words the treatment here reminds one of that in such a manual as Britton's, or Gray's, and while keys are freely used, the genera and the species are separately described. One wishes that more local floras could be modeled after this very satisfactory little book.

BOTANICAL NOTES

FROM the Central Experimental Farm at Ottawa, Canada, there comes a bulletin (No. 73) of more than ordinary scientific interest.

It is entitled "Smut Diseases of Cultivated Plants, Their Cause and Control," and was prepared by the Dominion Botanist, Mr. H. T. Güssow. In somewhat less than sixty pages the author presents in fairly non-technical language the important facts about smut fungi in general, followed by details regarding ten species which attack wheat, barley, oats, corn, broom corn, and millet. In an appendix the latter are described botanically for the benefit of students. Good figures, which are freely used, help both the farmer and the student to identify the diseased hosts, as well as the parasitic fungi. Preventive and remedial measures are suggested at every step. The importance of such a bulletin may be appreciated when we remember that it is estimated that Canadian farmers annually lose about $15,000,000 from the ravages of these smuts.

Botanists and foresters will be glad to know that Professor A. F. Blakeslee and his colleague, C. D. Jarvis, have reprinted the Keys to the Genera and Species of Trees in the Eastern United States. These were originally in their book "Trees in Winter," and the many requests from teachers and others for separate copies of these keys have induced the authors to issue them in a 15-page pamphlet. It may be obtained of the authors at Storrs, Conn., for 30 cents, and should prove helpful to teachers who are trying to teach their pupils how to know the names of the trees about them.

Some months ago there came to hand the Annual Report of the Agrostologist and Botanist of the Transvaal for the year 1911, bearing date of June, 1912, but issued later from the press. It was prepared by Professor J. Burtt-Davy, the well-known botanist of south Africa, and contains many items of considerable botanical interest, especially to those whose interest extends to applied botany. A large part of the paper is devoted to a discussion of the plants suspected of being poisonous to cattle ("lamziekte").

Among recent contributions from the United States National Herbarium (Volumes 16 and 17) are the following: Cook and Doyle's Stilt Palms (*Iriartineae*), describing three new genera; Britton and Rose's Studies in Cactaceae, in which they describe seven new species from Mexico, Guatemala and Panama; Cook's Relationship of *Pseudophoenix*, a curious relative of the Date Palm; Britton and Rose's Genus *Epiphyllum*, in which two new genera and five new species are described from Mexico and southward: Smith and Rose's Monograph of certain tribes (Hauyeae and Gongylocarpeae) of the Onagraceae, represented by Mexican and Californian genera; Maxon's Fourth instalment of his Studies of Tropical American Ferns, containing notes on *Asplenium trichomanes, Dicksonia, Odontosoria*, and other fern genera, and new species of *Lycopodium;* Hitchcock's Mexican Grasses in the U. S. National Herbarium, including 133 genera and 613 species. The large genera are *Muhlenbergia* (58 species), *Panicum* (54 sp.), *Paspalum* (39 sp.), *Andropogon* (28 sp.), *Bouteloua* (28 sp.), *Sporobolus* (21 sp.), *Eragrostis* (21 sp.), *Aristida* (19 sp.) and *Stipa* (16 sp.). Six bamboos are enumerated.

The Contributions from the Gray Herbarium of Harvard University (N. S., XLII.) include critical studies of certain genera of Composites, and a report upon the grasses collected in British Honduras by Professor M. E. Peck.

Charles E. Bessey
University of Nebraska

SPECIAL ARTICLES

MITOCHONDRIA IN TISSUE CULTURE

The immense literature[1] which has grown up in the last few years, concerning these minute bodies found in the cytoplasm of various cells in many different species not only of vertebrate and invertebrate animals but also of plants, and the great importance which has been assigned to them by various authors must necessarily arouse even more general interest and increased observation and discussion.

A multiplicity of names has already been given these bodies: mitochondria and chon-

[1] J. Duesberg, *Ergebnisse der Anatomie und Entwickelungsgeschichte*, Bd. XX., 1911.