gradual, rather than forced, improvement in the milk supply, and sanitarians are warned against entertaining premature conclusions. Those sanitarians who have recklessly connected mastitis in cows with human diseases receive criticism from the author, although he does not neglect to emphasize that milk from cows with diseased udders should be rigorously excluded from human consumption, unless previously boiled. The author also points out that—as desirable as it is to establish grades of market milk—existing regulations are rarely reasonable and generally immature. Numbers of bacteria in milk are of relatively smaller significance than the possible presence of pathogenic bacteria. These may multiply in milk of small bacterial content more rapidly than in milk rich in bacterial life. Special emphasis is laid on the necessity of instructing producers. And here it must be stated that Professor Löhnis ranks among those old-world scientists who are ready to give full credit to American workers in agricultural fields.

One lecture is devoted to the bacteriology of butter and two lectures to cheese. There are five lectures on the bacteriology of manure and soil. These are also conservative and critical. Finally, the whole subject is reviewed in a retrospect and a prospect. Valuable suggestions for those interested in research work in agricultural lines are given.

As a whole the subject-matter is presented in good style, the numerous illustrations are exceptionally clear, and no one can read the book without adding materially to his knowledge and broadening his views.

P. G. Heinemann

Franz von Kobells Lehrbuch der Mineralogie. Seventh edition. By K. Oebbeke and E. Weinschenk. Leipzig, Friedrich Brandstetter. 1913. Pp. viii + 405; 1 plate; 344 figures in text. Price, 8.50 Marks.

In 1899 the sixth edition of this popular German text-book on mineralogy appeared under the same joint authorship as the present edition. In the new edition the text has been increased by 67 pages. The general portion has been entirely rewritten and the descriptive part revised so as to bring the mineral data up to date.

There are three subdivisions in the general part, namely: (1) Crystallography, (2) Physical Mineralogy, and (3) Chemical Mineralogy; the special part is devoted to Descriptive Mineralogy.

Crystallography is discussed in 70 pages and under three headings, (*a*) general morphological properties of minerals, (*b*) special geometrical properties of crystals and (*c*) twins, development and intergrowths of minerals and inclusions. The discussion of crystallography is well adapted to the needs of the beginning student. The more important classes of crystals are considered at length upon the modern basis of symmetry, but reference is also made to the rather useful ideas from the standpoint of pedagogy of holohedrism, hemihedrism and so forth. The crystal drawings are exceptionally clear. Fig. 51 is, however, inverted.

Thirty-seven pages are devoted to physical mineralogy, which includes the following subdivisions, (*a*) specific gravity, (*b*) elasticity and cohesion, (*c*) optical properties and (*d*) miscellaneous physical properties. The discussions in this section are again limited to only that which is of importance to the student who has a general knowledge of mineralogy in mind. Thus, the polarization phenomena of crystals are disposed of in 14 pages.

The next 60 pages are devoted to chemical mineralogy. Here, (*a*) general chemical properties, (*b*) occurrence and formation, (*c*) weathering and decomposition, (*d*) synthesis and (*e*) classification and nomenclature of minerals are discussed. The chapter on the occurrence and formation of minerals contains a large amount of information not usually included in text-books on mineralogy of this character. Brief reference is first made to the classification, form, structure and paragenesis of mineral deposits. Then follow concise descriptions of the various types of the more important rocks and mineral deposits. This chapter is very well written, and similar discussions could be introduced to advantage in American texts on mineralogy.

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.

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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.