

methods yet issued. The subject is presented in a careful, well-balanced, well-digested form, not encumbered with unnecessary diffuseness and not marred by too great attention to pathological and omission of non-pathological details. Investigations in bacteriology, in order to carry weight, must be conducted with a full appreciation of the absolute need of refined manipulation, and their completeness depends upon a knowledge of the numerous ways in which they may be conducted and of the ends to be attained by each process. This work admirably meets the requirements of a safe and practical guide to both the student and the specialist.

Some of the topics treated are the principles of sterilization, direct examination of bacteria, uses and methods of staining, pure cultures, cultivation in fluids, fractional and dilution methods, opaque and transparent solid cultures, slide, plate and test-tube cultures, determination of the causal relation of bacteria to decomposition and disease, septic and parasitic bacteria, the effects of temperature, pressure, gases, and electricity upon bacteria, how to study the bacteria in earth, air and water. Many other topics are also considered, but an enumeration of all of them would still fail to give a just idea of the book's real value, which lies to a considerable extent in the admirable manner in which each topic is treated.

Some fault might be found with the translation, but as the defects do not affect the truthfulness of the work, so far as noticed, they may well be left to the captious. The American publishers have done their part of the work well, although the matter has been spread over one-fourth more space than in the German edition. The two fine colored plates are omitted, but a useful index is added.

The German work was published in February, 1885. It ran through two editions, and in November, 1885, a third much improved and augmented edition was prepared, but was not received in time for the translator to make use of it. This third edition adds seventy pages of new matter and nine new woodcuts. The additions are scattered throughout the work, upon nearly every page, the most considerable being descriptions of Fol's sterilizing kettle, Chamberland's porcelain filter, apparatus for sterilizing and cultivating at constant temperatures below 75° C., other forms of culture vessels and inoculating instruments, additional nutrient solutions, and the principles of staining. The four pages of the original work upon the classification of the bacteria have been nearly tripled and entirely rewritten. The colored plates illustrate slide, plate and test-tube cultures, cultures on opaque solid media, and staining for several purposes.

Bacteriological studies in America can not fail to receive a decided impulse from the advent of this admirable work, and we shall not be surprised to find that new editions are demanded often enough to keep pace with the growth of technic.

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## NOTES AND NEWS.

THE *Western Druggist*, published in Chicago, has a good botanical department, edited by Prof. E. S. Bastin.

AN INTERESTING article on *Pezizæ* by J. B. Ellis is given in the April number of the *Journal of Mycology*.

DR. GOODALE is giving a course of semi-weekly lectures before the Woman's Education Association of Boston.

IN THE JUST established Buffalo College of Pharmacy, Dr. D. S. Kellicott has been appointed professor of botany and microscopy.

A WORK on the forms of bacteria and their relation to genera and species has been published by Dr. Hueppe, and is reviewed in this number.



THE APRIL number of the *Journal of Microscopy and Natural Science* contains a sketch of Charles Darwin, being an address by H. W. S. Worsley-Benison, F. L. S.

DR. VASEY in the *Bulletin of the Torrey Botanical Club* records finding tubers on *Hydrocotyle Americana*. They were oblong, and from a quarter to half an inch long.

DR. J. H. OYSTER, of Paola, Kansas, has just lost by fire all the copies of his "Catalogue of the Plants of America." Next winter he proposes to publish a new edition.

GARTENFLORA, of March 15, contains a notice of Dr. Gray's seventy-fifth birthday, and also an outline of his life, taken from the biographical sketch in the January GAZETTE.

AN EXPLANATION of the mechanical causes of the various methods of aestivation is attempted by K. Schumann in *Berichte der deutschen botanischen Gesellschaft*, iv. 53-68.

AUG. SCHULZ records a case (Ber. d. deut. bot. Gesell. iv. 52) in which the outer walls of certain epidermal cells of *Salicornia herbacea* were found to separate entirely from the side walls.

FROM THE report of the Montreal Botanic Garden we learn that there are 197 known botanic gardens. Germany has 34, Italy 23, France 20, Great Britain and Ireland 12, West Indies 6, United States 5.

PROF. J. L. BUDD, of the Iowa Agricultural College, has issued a bulletin of 64 pages, containing revised lists of fruits, trees and shrubs from N. E. Europe, that have been on trial on the college grounds.

THE READERS of the GAZETTE will be interested in the complimentary dedication of a new genus of grasses to the well known American agrostologist, by Prof. Hackel of Austria, especially as its first publication is made through an American journal.

THE JOURNAL of the New York Microscopical Society has reached the end of its first year. The editor, Mr. Braman, who has managed its publication with marked success, finds it necessary to resign. The journal is deserving of ample support.

WE WOULD CALL attention again to the sections of the leaves of *Abietineæ*, to be obtained of Rev. J. D. King, of Fall River, Mass. They are admirably mounted and stained and are well calculated for a critical study of these peculiar leaf structures.

PINUS ENGELMANNI has turned up again. Forty years ago Wislizenus collected in the mountains of Mexico a single specimen, which is now in the Berlin herbarium. Good specimens of leaves and cones have lately been received at the Gray herbarium.

THE ALGA, *Pithophora Kewensis*, first found in a lily tank at the Kew Gardens and supposed to be tropical, has been found by Mr. Wolle, Mr. Balen and others in several localities in eastern United States, according to the *Journal of the N. Y. Microscopical Society*.

SOME MARKED DIFFERENCES in the structural character of the flowers of different varieties of the apple are illustrated and described by Dr. W. J. Beal in the February number of the *American Naturalist*. It is suggested that such characters might well be used in horticultural descriptions of varieties.

MR. JOHN MACOUN of the Survey of Canada is on a visit to Europe. Before leaving this country he completed the writing of Part III of the Catalogue of Canadian Plants, which carries it through the *Coniferæ*. This part will also include an addendum bringing the whole work up to date, and a complete index.

A LARGE COLLECTION of Scandinavian mosses belonging to the late J. E. Zetterstedt is for sale, either in sets or by single specimens. The first series of 209 specimens is offered for seven dollars, or specimens may be selected for less than five cents each. The specimens and labels are in envelopes unmounted. Address, Dr. H. Wilh. Arnell, Jönköping, Sweden, using either English, French or German.

THE BACTERIOLOGICAL EXAMINATION of drinking water is attracting much attention, and the remarks of Dr. Theobald Smith before the Biological Society of Washington, printed in the *Amer. Microscopical Journal* for April, are timely. Before unskilled investigators publish results they should carefully peruse this article, and not unwittingly bring such work into disfavor by overlooking the simple fact that the germs of water are largely innocuous, and that the detection of disease germs in drinking water is at present extremely difficult.