

tion have thought of the common use of 'spore' and 'sporangium' in the description of the structure of the flowering plants, and how they would have denounced the use of 'flower' and 'placenta' in the similar description of the ferns and their allies! Surely the old boundaries between lower and higher plants are rapidly being obliterated when we find such a free borrowing of terms once thought to be peculiar to this or that portion of the vegetable kingdom. Here is the present-day definition of a flower—'a shoot beset with sporophylls,' originated many years ago by Schleiden, but generally rejected by botanists until within a comparatively short time. In this broad definition we may include the spore-bearing cones, not only of *Lycopodinae* and *Equisetinae*, but also the whole fern (sporophyte) when it is bearing spores. On page 472 we have a chapter heading 'The Sporophylls and Flower of the Pteridophyta'—which would have puzzled and no doubt shocked the old-time botanists, and quite as puzzling would have been the section (page 400) devoted to 'the cotyledons of the Pteridophyta.'

In this fine volume, which must at once come into very general use, we have another illustration of the excellent translations made by Professor Balfour, and the high quality of the printing and binding done by the Clarendon Press, in the remarkable series of volumes which have appeared during the past twenty years.

CHARLES E. BESSEY.

THE UNIVERSITY OF NEBRASKA.

Outlines of Inorganic Chemistry. By FRANK AUSTIN GOOCH, Professor of Chemistry in Yale University, and CLAUDE FREDERIC WALKER, Teacher of Chemistry in the High School of Commerce of New York City. New York, The Macmillan Co. Pp. xxiv + 233 + 514. 8vo. \$1.75.

Until some few years ago the teacher of general chemistry considered that he had covered his subject pretty fully if, in addition to the descriptive facts concerning the elements and compounds, he had given his students correct ideas concerning the laws of chemical

combination, molecular and atomic weights, the periodic law and the theory of valence. The development of physical chemistry, however, in the last fifteen years has brought into prominence a number of new laws and principles and it is necessary that these should find a place in every modern course of instruction in chemistry. This has given rise to a demand for new text-books in which these new generalizations are clearly set forth.

One of the first text-books which gave prominence to the laws of physical chemistry was Ostwald's 'Grundlinien der Anorganischen Chemie' which was published in 1900. This book may be said to have been a veritable mine of information for teachers and it has undoubtedly had a great influence in modernizing courses of instruction in inorganic chemistry. Ostwald's book, however, is too advanced and contains too much detail for the average undergraduate. A number of smaller text-books have appeared in which the attempt was made to simplify the subject and adapt it for college classes.

This new text-book by Professors Gooch and Walker is entirely different from these books that were patterned more or less closely upon the lines of the Ostwald. It is divided into two distinct parts. In the first or inductive part there is a consecutive experimental development of the principles and theories of the science. In the second or descriptive part the facts concerning the elements and compounds are clearly and concisely set forth.

The first seven chapters of part one deal with chemical change, elements, compounds, the laws of combination and equivalent weights, hydrogen, oxygen, air and nitrogen. Then electrical equivalents and ions, acids, bases and salts form the subject matter of the eighth and ninth chapters. Then follow equilibrium, mass action, the phase rule. The last chapters are upon heat and thermal equivalents, valence and atomic and molecular theories. It is here shown that the chemical, electrical and thermal equivalents represent proportionate numbers of mass units or atoms and atomic and molecular weights are defined.

In the second or descriptive part, after a chapter on classification and the periodic law,

the elements are taken up in series beginning with hydrogen. Under each element all the more important facts concerning it and its compounds find mention. A great many graphic formulas and equations are here given. The rare elements are also briefly noticed. A very large amount of information together with the latest and newest facts is here brought into small compass. The statements are clear and concise and the book is remarkably free from errors. There are few important omissions. The transition point of mercuric iodide is given, but not that of sulphur nor that of tin. Freezing mixtures are mentioned, but no explanation is given of their action. On the whole, however, this is an excellent text-book, it is planned on new and original lines and it deserves the careful consideration of all teachers of chemistry.

EDWARD H. KEISER.

SCIENTIFIC JOURNALS AND ARTICLES.

The Bulletin of the College of Charleston Museum for January contains the report of the director, Dr. Paul M. Rea, and is an encouraging account of progress, though under difficulties. The museum has important collections and, as Dr. Rea points out, with the funds and assistance necessary to put these in order and make them available to the public, will become an important educational factor.

Bird Lore for January-February has for its most extended article the Sixth Christmas Bird Census, containing records from Maine to Louisiana and British Columbia. There are good illustrated articles on 'An Experience in Tree-top Photography,' by Bert F. Case; 'My Chickadee Family,' by Marion Bole; 'The Dipper in Colorado,' by Evan Lewis, and 'The Little Green Heron,' by Rett E. Olmstead. In the report of the Audubon Societies it is noted that the murderer of Game Warden Bradley was not even indicted. As an offset to this are the resolutions passed by the Millinery Jobbers Association at the Louisville Convention, pledging themselves not to buy song birds, gulls, grebes or herons

after January 1, and not to sell after July 1, 1906.

The Zoological Society Bulletin for January contains a well-illustrated article on the 'Pheasant Aviary and its Inmates' which comprise forty species of gallinaceous birds. The 'Founding of a New Bison Herd in the Wichita Forest Reserve' is announced and it is hoped this may lead to the starting of herds in other localities while the bison are yet available. It is stated that the female giraffe received in 1903 has grown one foot and eleven inches and the male two feet and ten inches, the one standing twelve feet high, the other thirteen feet and six inches. Barring accidents, they should before long reach their full height of between sixteen and seventeen feet. There is an article with several good pictures of the smaller cats and, finally, a summary of the larger items of work accomplished during 1905.

SOCIETIES AND ACADEMIES.

AMERICAN PHYSICAL SOCIETY.

THE annual meeting of the Physical Society was held in Fayerweather Hall, Columbia University, New York City, on Friday, December 29, and Saturday, December 30, 1905.

The presidential address of President Barus, on 'Condensation Nuclei,' was delivered on Saturday, December 30, at 11 A.M.

Friday afternoon, December 29, a joint session of the American Physical Society and the American Mathematical Society was held in Havemeyer Hall, at which a paper on the 'Experimental Demonstration of Hydrodynamic Action at a Distance' was presented by Victor Bjerknes.

The following papers were presented:

A. W. EWELL: 'The Electrical Production of Ozone.'

E. RUTHERFORD: 'Some Properties of the Alpha Rays from Radium, II.'

E. RUTHERFORD: 'On the Magnetic and Electric Deviation of the Alpha Rays.'

E. P. ADAMS: 'The Absorption of Alpha Rays in Gases and Vapors.'

H. A. BUMSTEAD: 'The Heating Effect produced by Röntgen Rays in Different Metals and