ing branches. The reviewer must confess his inability to understand clearly Professor Lockyer's differentiation between descending and ascending stars, although not wishing to question the probability that both branches exist.

In subsequent chapters the author interestingly discusses the bearing upon the dissociation hypothesis of the recent discoveries of series in the spectra of the elements, of pressure shifts of lines, of magnetic perturbations (Zeeman effects), and of the 'fractionation' evidence. He finds in them a quite satisfactory confirmation of his hypothesis, and displays great skill and command of the subject in marshaling to its support the data from such various sources.

As has been said of other volumes in this series, the illustrations do not adequately reproduce the author's original photographs, and could be greatly improved upon in a future edition.

EDWIN B. FROST.

Outlines of Electrochemistry. By HARRY C. JONES, Associate Professor of Physical Chemistry in the Johns Hopkins University. New York, The Electrical Review Publishing Co. Price, $1.50.

The author has not tried to give an exhaustive account of electrochemistry, for he prepared the seven chapters, which cover about one hundred pages, for a technical journal, whose readers are for the most part men busy in every field of applied engineering science; consequently he wisely selected those theoretical topics which would appeal most strongly to this particular class of students. The book, however, will prove instructive and helpful to all who wish to get a clear and definite knowledge of the subjects it presents. The writer has read it with profit, and feels sure that he does not err in recommending it. One might, however, well ask whether 'the whole subject of the electrolytic separation of the metals was opened up' (p. 44) through the study of the decomposition values of the ions by LeBlanc, Freudenberg and others in Ostwald's laboratory, when it is recalled that all but three or four of the separations recorded by these chemists had been made long before by others? Or, if 'the decomposition values of the ions' is the vital point, should we omit mention of the work of Kiliani, who first carried out metal separations by attention to the differences in electromotive force? Perhaps these may be regarded as minor matters, but the historical development of the subject calls for their presence.

EDGAR F. SMITH.

Enzymes and Their Application. By Dr. JEAN EFFRONT. Vol. I., The Enzymes of the Carbohydrates. Translated by SAMUEL C. PRESCOTT. New York, John Wiley & Sons; London, Chapman & Hall, Limited. 1902. 8vo. Pp. 322.

This is a very excellent work and is a valuable addition to the literature on enzymes and their application. The book is designed to meet the wants of not only scientific investigators, but also of those interested in the industrial application of these substances, and will be appreciated by both classes. The author has carried out his purpose in a clear, concise manner. From the standpoint of theoretical consideration he is careful and conservative, and his treatment of the technical application of enzymes to commercial practices is unusually full and clear for a work of this kind. The book is more than a compilation, inasmuch as the author has, as stated in the preface and borne out by internal evidence, confirmed in his laboratory most of the facts presented. The second volume which is now in course of preparation, will take up the proteolytic enzymes and the toxins, and its appearance will be looked for with interest. Professor Prescott is to be congratulated in presenting a translation that in no way detracts from the original. The printing is well done and the paper and binding good.

ALBERT F. WOODS.

BUREAU OF PLANT INDUSTRY,
U. S. DEPARTMENT OF AGRICULTURE,
WASHINGTON, D. C.

Animals of the Past. By FREDERIC A. LUCAS. New York, McClure, Phillips & Co. 1901.

One who has had much to do with a public museum of extinct vertebrates is pretty sure of the queries that the ordinary sight-seer will

propose for answer. Meaningless bones will be clothed with new interest when it is learned that they are millions of years old, and that the place whence they came was once the bottom of an ocean or broad lake. And he invariably desires to learn how it is known where to dig for them, how they are preserved, and a multitude of similar things. It is very evident that the author of 'Animals of the Past' has had no inconsiderable experience in answering such questions, else he could hardly have encompassed within its pages so much and so clear information about those things that the general public desires most to know concerning fossils. We will not quarrel with him for the omission of a limiting adjective in the title, nor suggest that some of its humor is a trifle far-fetched, in consideration of the fact that the book on the whole is very good. One who is acquainted with the author's work in paleontology will expect accuracy and reliability, and he will not be deceived here. He has kept his imagination in check—not always an easy thing for the paleontologist to do!—and has said what he has to say in an easy way that even the schoolboy will enjoy. The book is, moreover, scientific, and not a collection of paleontological fables; it is, I think, the best of its kind yet published. It tells how the bones of extinct animals become fossilized, are found, collected, restored and mounted, of the many problems they present and the inferences they suggest, the causes of growth and decay among the animals of the past, etc.; matters that really interest the general reader quite as much as details concerning creatures which he can only imperfectly comprehend. But the contents would belie the title, were this all. Many of the largest, most interesting and remarkable of extinct backboned animals, the rulers of the air and sea and dry land, mastodons, mammoths, horses and the like are described, and illustrated by restorations as in life from the skilful brush of Gleeson and Knight. Knight's reputation in such things is well known—his work is the very best, but Gleeson in the present instance comes a close second to him. The book is a good one for both the public and private library.

S. W. WILLISTON.

SCIENTIFIC JOURNALS AND ARTICLES.

The Osprey for February contains 'Notes on the Habits of the Broad-winged Hawk (*Buteo platypterus*) in the Vicinity of Washington, D. C.,' by J. H. Riley; 'Rambles about my Old Home,' by Milton S. Ray; 'The Mocking Bird at Home,' by F. H. Knowlton; 'Reminiscent, Random and Maine Bird Notes,' by W. C. Kendall, and a sketch, with portrait, of that most able ornithologist, 'Professor Alfred Newton,' by R. W. Shufeldt. The supplement, devoted to the 'General History of Birds,' contains a description of the general characters of the class and of the plumage.

The Plant World for February contains 'A Botanical Ascent of Mount Kataadin, Maine,' by John W. Harshberger; 'Another Trip to Glen Burnie, Maryland,' by C. E. Waters; 'Botanizing in Winter,' by C. F. Saunders, and 'A Primrose at Home,' by F. H. Knowlton, besides the usual and numerous notes and briefer articles which contain much of interest. In the 'Families of Flowering Plants' Charles L. Pollard concludes the description of the orders Opuntiales and Myrtifloræ and commences that of the Umbellales.

The Museums Journal of Great Britain for February contains an article on 'Museum Statistics,' intimating that it is desirable to know just how they are obtained, whether by estimate or by actual record. J. G. Goodchild presents an article 'On the Arrangement of Geological Collections,' and there is a sharp bit of criticism on some recent 'British Museum Appointments' in the entomological section. The subject of 'Hygiene as a Subject for Museum Illustration' is continued, showing the proposed arrangement of the divisions water, soil and personal. There is a large number of notes.

The American Museum Journal for February presents a review of the current work of the various departments and their more notable accessions, which include a good collection of mammals from Alaska, a fine skull of the woolly rhinoceros (*R. tichorhinus*) and a good series of butterflies from the Australasian region. This month's supplement is the Guide