scribed and illustrated in the Bulletins and Memoirs of the Museum by Messrs. Osborn, Wortman, Matthew (W. D.), and Earle.

A description of this department of the Museum would be very incomplete without mention of the life-like water-color restorations of mammals and reptiles which have been made by Charles R. Knight, under the direction and with the advice and assistance of Professors Osborn, Cope and Scott. These pictures are, without question, the best attempts that have ever been made to represent the animal life and the scenery of Mesozoic and Cenozoic time in this country or Europe. The collection is very thoroughly labeled, with elaborate descriptive as well as individual labels and photographic transparencies of many of the western fossiliferous localities occupy some of the windows.

Edmund Otis Hovey.

SCIENTIFIC BOOKS.

Evolution by Atrophy in Biology and Sociology. By Jean Demoor, Agrégé of the Free University of Brussels; Jean Massart, Chargé de Cours of the Free University of Brussels; Emile Vandervelde, Professor at the Institute des Hautes Études of Brussels, translated by Mrs. Chalmers Mitchell. The International Scientific Series. New York, D. Appleton & Co. 1899.

An eminent American economist has declared the bankruptcy of biological sociology. The authors of 'Evolution of Atrophy,' have assumed the receivership of a section of biological sociology, namely, that dealing with degeneration. Realizing that "biosociological investigations have hitherto been conducted either by naturalists with a limited knowledge of social questions, or by sociologists whose training was incomplete and superficial," their researches on degeneration "have been made separately from the social side and from the biological side, and have now been coordinated and combined." The volume is divided into three books, dealing respectively with 'Universality of degenerative evolution,' 'The path of degenerative evolution,' and 'Causes of degenerative evolution.' Each book is divided into three parts, the third of which gives a summary and conclusions of the first two. The result of the collaboration of several authors has resulted in a well-systematized arrangement of topics and an attempt at balancing a part, chapter, or section in Biology with a similar one in Sociology. Thus Part I. of Book I. deals with 'Degeneration in the development of institutions and organs.' Chapter I. 'In the evolution of organs all modification is necessarily attended by degeneration.' Chapter II. 'In the evolution of institutions all modification is necessarily accompanied by degeneration,' and of Part I., Chapter I., 'All organisms exhibit rudimentary organs.' Chapter II. 'Survivals exist in all kinds of societies.' Or in Book II., Part II., Chapter I., we have: *Section I.* 'Disappeared organs.' *Section II.* 'Disappeared institutions.' There is thus a constant interlarding of fat with lean.

Book I. is essentially a statement of facts from which the authors conclude that "degenerative evolution exists everywhere * * * in the evolution of organs certain facts may disappear completely * * * in the evolution of organisms certain organs may also disappear. * * * Not only may a larval stage or an adult stage be completely suppressed, but a multicellular organism may even lose its power of dying." Degeneration is not an accident and is not confined to unusual, abnormal or pathological cases. Living and superior civilizations drag behind them a trail of débris from dead civilizations.

Book II. is an examination of the question whether the degeneration of individuals and of organs proceeds by successive atrophies occurring in the order opposite to that of ontological formation. In considering the series of pineal eyes offered by various animals they "cannot refrain from the conclusion that in this series degeneration retraces to a large extent the steps of original advance." This, however, is not a universal application, and "although the most recently acquired features may disappear first, degeneration is not an actual retracing of steps until the point of departure is reached. The degenerate condition is a new point, and really the term retrogres-

sive evolution is misleading." "Rudimentary organs and institutions resemble the primitive states of these, in so far as they no longer possess certain parts which the primitive stages did not yet possess. None the less profound differences exist between the primitive and the reduced forms." This difference lies largely in the difference of potentiality of the primitive and the degenerate organ to vary in the direction of new uses. "After a certain degree of atrophy, there is no longer the possibility of re-development to resume old or to acquire new functions."

The Degeneration is in Book III. attributed to (1) lack of space; (2) lack of use; (3) lack of nutrition, as in the genitalia of neuter bees; (4) atrophy without apparent cause. If a functionless organ persists it is because neither variation nor selection has intervened. The struggle for existence between the various organs and the struggle for existence between various organisms are in the opinion of these authors 'the principal if not the sole agents in degeneration,' while inutility of function, insufficiency of nutriment or resource, and lack of space are occasional causes of degenerative evolution.

The book is written in a popular and entertaining style.

C. H. EIGENMANN.

Sounding the Ocean of Air. By A. LAWRENCE ROTCH, S.B., A.M. Romance of Science Series. London, Society for Promoting Christian Knowledge, and New York, E. and J. B. Young. 1900. Small 8vo. Pp. 184. $1.00.

The work in kite meteorology carried on during the past six years at Blue Hill Observatory under the direction and through the liberality of Mr. A. Lawrence Rotch needs no introduction to the readers of SCIENCE. Mr. Rotch's pioneer work in scientific kite-flying has received the stamp of official approval at the hands of the International Meteorological Conference and of the International Aeronautical Committee, and similar investigations have lately been begun at several of the European meteorological observatories. 'Sounding the Ocean of Air' is the attractive title of a little book, issued in the Romance of Science Series, which comprises six lectures delivered by the author before the Lowell Institute of Boston, in December, 1898. The subjects dealt with in the six chapters are 'The Atmosphere'; 'Clouds'; 'Balloons'; 'Ballons-sondes for Great Altitudes'; 'Kites,' and 'Results of Kite-Flights at Blue Hill.' The whole volume presents a clear and systematic account of the history and present status of the exploration of the free air. The last chapter, on the 'Results of the Kite-Flights at Blue Hill,' gives a useful summary, almost too condensed for understanding without careful study, of the notable results obtained by Mr. H. H. Clayton, of the Blue Hill Observatory staff, from the records made by the kite meteorograph. This chapter will, therefore, probably have the greatest interest for meteorologists, although the chapter on Clouds, in which the Blue Hill cloud work is given special attention, is hardly less important. This little book is to be recommended to all who wish to inform themselves concerning the work that is now being done in 'sounding the ocean of air,' as Mr. Rotch has happily phrased it. The volume emphasizes once again the high scientific quality of the work done by Messrs. Clayton, Fergusson and Sweetland, under Mr. Rotch's direction, at Blue Hill Observatory. The dedication is so appropriate as to deserve quotation here: "This little Book is gratefully dedicated to the late Augustus Lowell, Esq., of Boston, U. S. A., who, as Trustee of the Lowell Institute, enabled Scientific Men of Two Continents to present the Results of their Investigations to the Public."

R. DEC. WARD.

HARVARD UNIVERSITY.

Free-hand Perspective. By VICTOR T. WILSON. New York and London, Wiley and Sons; Chapman & Hall. 1900. 8vo. Pp. xii + 257. Ill., 139.

This is a work intended for use in a section of the free-hand classes of the drawing departments of technical schools and in similarly appropriate work. It is seldom that the writer of a book of this class can now expect to bring out anything essentially original in either matter or manner, or treatment generally. In this case, however, original genius has found expression, and we discover in Mr. Wilson's book some entirely new and very valuable matter;