minute anatomical and embryological work that has played so great a rôle in the laboratory methods of comparative morphology. These methods were a healthy reaction against the superficial character of much of the earlier work; they form the indispensable basis of all exact and thorough training in biology; but too often in our courses of instruction they have been carried to such a point that the student has lost himself amid anatomical detail of a kind as dry and formal as that of the old-fashioned systematic museum-study. Experimental research is already, I believe, exerting the happiest influence on our methods of teaching by showing how indispensable to a course in comparative morphology is the consideration of physiological phenomena and a study of the living organism.

I cannot better close than with the words that an eminent zoologist—we of this company have not far to seek him—has imagined to be the comment of Aristotle, could he have surveyed some of the aspects of our modern work in biology. "My teaching that the essence of a living being is not what it is made of, or what it does, but why it does it, has been rendered by one of your contemporaries into the statement that life is the continuous adjustment between internal relations and external relations. If this is true, is not the biology which restricts itself to the physical basis and forgets the external world, like your play of 'Hamlet' without the Hamlet? Is not the biological laboratory which leaves out the ocean and the mountains and meadows a monstrous absurdity? Was not the greatest scientific generalization of your times reached independently by two men who were eminent in their familiarity with living things in their homes?" I for one agree with the author of these words that such a comment would be good common sense and therefore good science.

EDMUND B. WILSON.

SCIENTIFIC BOOKS.

Report of the United States Commission of Fish and Fisheries. Part XXV., 1899. By GEORGE M. BOWERS, Commissioner. Washington, Government Printing Office. Pp. clxiii + 397. Plates XXIX + 21.

The contents of this the twenty-fifth report is divided into two portions, of which the first relates to the official and more practical work of the fiscal year, and the second to the special or more scientific work, the preparation of which may have extended over a considerable period.

In speaking of the general condition of the fishery industry, Commissioner Bowers states that the approximate value of the commercial fisheries of the United States in 1899 was $40,000,000, to which the oyster industry contributed about $14,000,000. In comparing the productiveness of the oyster beds of Chesapeake Bay and of Long Island Sound, Commissioner Bowers states that the natural supply of oysters is being exhausted, but that the areas of the sea bottom that are being artificially cultivated are becoming more and more productive. There is sufficient evidence that the increased abundance of cod, in the inshore waters of the New England States, is due to the work of artificial propagation carried on at Gloucester and at Woods Holl. Efforts are being made to rehabilitate the lobster fishery and to devise methods for increasing the number of sturgeon.

Under the direction of Dr. Hugh M. Smith, the Department of Scientific Inquiry has inaugurated or continued several important lines of investigation. The systematic survey of the physical and biological conditions of Lake Erie, begun in 1898 by Professor Reighard, has been continued. Dr. B. W. Evermann has made a biological survey of the waters of the Northwest; Dr. W. C. Kendall has continued his work on the fauna of the lake systems of Maine; and Dr. H. F. Moore has made a study of the physical conditions of Great Salt Lake, and has showed its absolute unfitness for maintaining any form of marine life.

The laboratories at Woods Holl and at Put-in-Bay have been occupied by an enthusiastic corps of investigators, and a building was rented at Beaufort, N. C., to serve as a temporary lab-

oratory. But with these matters readers of SCIENCE are well acquainted. The list of publications for the year numbers forty-six.

The work of the division under Mr. W. deC. Ravenel was the most extensive in the history of the Commission. More than one billion fry were distributed. Mr. Ravenel's report is illustrated with many photographic reproductions and plans of the twenty-nine stations. Mr. C. H. Townsend's statistical tables will prove of inestimable value to those who in the future may wish to follow the rise and decline of the different fisheries. The capture of one hundred and forty bowhead whales by the Pacific fleet in the Arctic Ocean produced an eventful, even if only temporary, elevation in the curve of decline of the whale fishery. It is with a feeling of sorrow that one reads of the slaughter of four thousand sea elephants on Kerguelen Island.

The articles published in the appendix are of both general and scientific interest. Several have a tropical flavor. The papers of Mr. W. A. Wilcox, Mr. C. H. Townsend and Mr. J. N. Cobb are mainly economic. Messrs. Evermann and Kendall have prepared an acceptable check list of the fishes of Florida. New genera and species of fishes from Porto Rico are described by Messrs. Evermann and Marsh. Dr. Moore gives an interesting account of his 'Inquiry into the Feasibility of Introducing Useful Marine Animals into the Waters of Great Salt Lake,' and Dr. Rathbun contributes 'A Review of the Fisheries in the Contiguous Waters of the State of Washington and British Columbia.' The scope of this paper is limited to the fishery questions of the region that are of international concern. While such papers have an immediate interest, their value really increases as time goes on, for they give a record of the more primitive biological conditions, without which it would be quite impossible in the future to determine the changes that have been wrought in the natural productiveness of a region by the occupancy of man.

H. C. BUMPUS.

Report on the International Cloud Observations. Prepared under direction of WILLIS L. MOORE, Chief of Weather Bureau, by FRANK H. BIGELOW, Professor of Meteorology. U. S. Department of Agriculture, Weather Bureau. Report of the Chief of the Weather Bureau for 1898–99. Vol. II. 4to. Washington, D. C. 1900. Pp. 787. Charts 79.

The Report on the International Cloud Observations, just published by the Weather Bureau, is one of the most detailed and elaborate studies of clouds that has yet been issued. Professor Bigelow, who has been in charge of the reduction of the observations, has not limited his investigations to the tabulation and simple discussion of the heights, velocities, and directions of movement of the different clouds, but has gone far into the thermodynamic and hydrodynamic problems which grew out of his study of the cloud observations. As he himself says in his preface: "In order to submit these results to a careful discussion, it has been necessary to prosecute a critical comparative study of several important theories heretofore proposed by meteorologists, so that comparison between observations and theoretical computations can be suitably carried out. Accordingly, a standard mathematical system has been constructed, including in a definite notation the constants, the thermodynamic and the hydrodynamic formulæ pertaining to the atmospheric physical processes and motions, by means of which the work of the several authorities can be reduced to one set of typical equations. The theories of the American and German schools of meteorology have been contrasted, and the results derived from them have been compared with the facts obtained from these cloud observations." This quotation may serve to give some idea as to the thoroughness with which Professor Bigelow has done his work. Indeed, the report is the most comprehensive and important of the Government meteorological publications of recent years.

There are in all fourteen chapters, the first two of which relate to the methods of taking the observations, and of computing the heights, directions and velocities. Chapters 3 to 7 contain summaries of all the observations made with nephoscopes and theodolites, and the discussions of these observations. The subjects treated in the last seven chapters are as follows: 'The Typical Local Circulations over the United States,' 'Diurnal Oscillations of the Barometric