

SCIENCE :

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NOTICE TO SUBSCRIBERS.

We consider it due to those subscribers who have favored us with their subscriptions, previous to the publication of our club rates, that they should have the privileges of the list. They can therefore send us subscriptions for any or all of the publications named at the reduced double rates, less \$4, the subscription price of "SCIENCE."

THE Report of the United States Fish Commission* for the year 1878 constitutes a volume of nearly 1,000 pages of interesting matter, and, from the economic interests involved, should command more than a passing attention from those who are desirous of having the natural resources of this country fully developed.

A large portion of the Report, relating to purely scientific work, will be highly appreciated by every naturalist. For instance, the first division of the work including researches into the character of the fishes belonging to the North American fauna, was in charge of Mr. G. Brown Goode, assisted by Dr. T. H. Bean; while it is sufficient to say that the collection and investigation of marine invertebrates was conducted by Professor A. E. Verrill, assisted by Mr. Richard Rathbun, Mr. Sanderson Smith and Mr. Warren Upham, to show the value of the researches in this direction.

Few persons will peruse this Report without feeling an obligation to Professor Spencer F. Baird for the very thorough manner in which he is carrying out the objects of this Commission; for the ground he proposes to cover would appall one of less experience.

The amount of labor involved in carrying out the work of this Commission may be estimated by a brief reference to the programme which Professor Baird has sketched for future guidance :

*United States Commission of Fish and Fisheries, Part VI. Report of the Commissioner for 1878.

A. Inquiry into the Decrease of Food-Fishes.

B. The Propagation of Food-Fishes in the Waters of the United States. Washington Government Printing Office, 1880.

1st. The preparation of a series of reports upon the various groups of aquatic animals and plants of North America, especially those having relation to the wants or luxuries of mankind, to be afterwards published as monographs, with suitable illustrations.

2d. The distribution of specimens of aquatic animals and plants, not required for the National Museum, to the numerous educational and scientific establishments in the United States.

3d. A complete account of the physical character and conditions of the waters of the United States, as to chemical composition, temperature, etc., with special reference to their availability in nurturing the proper species of food fishes.

4th. A history and description of the various methods, employed in the United States, in the pursuit, capture and utilization of fishes and other aquatic animals.

5th. Statistics of the various branches of the American fisheries from the earliest dates to the present time, so as to show the development of this important industry and its actual condition.

6th. The establishment by the General Government, or in connection with the States, of a thoroughly reliable and exhaustive system of recording fishery statistics for the future.

7th. The bringing together in the National Museum not only of a complete collection of the aquatic animals and plants referred to, but illustrations of all apparatus or devices, used at home or abroad, in the prosecution of the fisheries.

8th. An investigation of the movements and habits of various kinds of fish, to serve as a basis for legislation, either by the General Government or by the States.

9. The arrangement of a code of regulations in respect to close seasons, and other matters of detail respecting the capture of fish.

10th. The stocking of the various waters of the United States with the fish most suited to them, either by artificial propagation or transfer, and the best apparatus and methods for accomplishing this object.

Professor Baird intends to supplement this immense amount of work by collecting and compiling statistics for the proper treatment of international questions connected with the common use, by the United States and the British Provinces, of the waters of the North Atlantic.

The volume before us bears ample proof of the power of Professor Baird and his assistants, to carry out this programme to its fullest extent, and if the work progresses at the present rate, its accomplishment will not be so far in the future as many would suppose.

We do not propose in this notice to epitomize the report; we prefer to do more justice to the subject by presenting from time to time brief abstracts of the paper, some of which are very elaborate, occupying 160 pages of closely printed matter, and 90 illustrations.

That part of the report describing the success of the commission in propagating salmon has been anticipated by the public press, but many of the details now given are new and of great interest. Many persons in the East will be astonished at the large scale of the salmon fishery in the Western rivers, where seven to nine thousand fish are sometimes taken in one day. From one station (the St. Cloud river), fourteen millions of eggs of salmon were secured and embryonized—sufficient to keep up the supply being returned to the river, the remainder were sent East; 7,250,000 arrived in Chicago between the 3rd and 7th of October. The report states that, after supplying the home demand, 500,000 were presented to Canada, 100,000 to England, 100,000 to France, 100,000 to Holland, 250,000 to Germany and 200,000 to New Zealand.

In regard to shipments to the last named country, it is satisfactory to be able to state, that they not only arrived in perfect condition, but that by the latest advices the young fish were seen in every direction, promising to be the ancestors of a numerous progeny.

Reference is made to Professor W. O. Atwater's investigations upon the food qualities of various species of fishes, the chief facts relating to which we were able to present in an abstracted form, to the readers of "SCIENCE," a few weeks since.

Various attempts have been made to introduce live specimens of the English Sole, one of the most delicious and prolific of British fishes. The last attempt by Mr. Fred. Mather, whose skill in fish culture is acknowledged in the report, was unfortunately like the rest—a failure. Mr. Mather gives a very reasonable explanation of his want of success, and it must be admitted that he was not supplied with the necessary conveniences. During 1880, Captain Mortimer was more successful, and succeeded in placing living specimens of the Sole (*Solea vulgaris*) in New York harbor. Captain Mortimer explained to us that his apparatus consisted of a tank having a fixed cover, to which were attached two globes, the constant rolling of the vessel causing the water of the tank to pass to the globes and return, thus keeping up a constant aeration for the fish, which naturally remained at the bottom.

We reluctantly close our notice of this most valuable and interesting Report feeling that our task has been but half fulfilled. We shall, however, again take up the subject in greater detail, and present our readers with many facts of much scientific interest.

THE AMERICAN CHEMICAL SOCIETY.*

The January meeting of the above Society was held in their rooms, Monday evening, January 3, 1881, Prof. C. F. Chandler in the President's chair. The nominations of Messrs. James F. Slade, Theodore M. Hopke, A. F. Hop-pick as regular, and of Mr. E. K. Dunham as associate members were made. The resignations of Prof. Ira Remsen, Prof. S. P. Sadler and Mr. L. W. Drew, read and accepted. A motion for the reduction of the annual dues from \$10 to \$5 was favorably considered, and the day of meeting was changed from Thursday to Monday, so that in the future, meetings will be held on the first and third Mondays of each month, instead of on the corresponding Thursdays. There being no papers before the society, the meeting was adjourned. We add herewith a list of the officers chosen at the December meeting for the present year: President, Prof. C. F. Chandler; Vice-Presidents, A. R. Leeds, G. A. Koenig, E. R. Squibb, Charles A. Goessmann, Henry Morten, Ira Remsen; Corresponding Secretary, P. Casamajor; Recording Secretary, Albert H. Gallatin; Treasurer, W. H. Nichols; Librarian, E. Waller; Curators, W. Rupp, A. J. Rossi, A. A. Fesquet.

ON A THERMO-MAGNETIC THERMOSCOPE.

BY SIR WILLIAM THOMSON.

This thermoscope is founded on the change produced in the magnetic moment of a steel magnet by change of temperature. Several different forms suggest themselves. The one which seems best adapted to give good results is to be made as follows:

1. Prepare an approximately astatic system of two thin hardened steel wires, $r\ b$, $r^1\ b^1$, each one centimetre long, one of them, $r\ b$, hung by a single silk fibre, and the other hung bifilarly from it by fibres about three centimetres long, so attached that the projections of the two on a horizontal plane shall be inclined at an angle of about .01 of a radian (or $.57^\circ$) to one another.

2. Hang a very small, light mirror, bifilarly from the lower of the two wires.

3. Magnetize the two wires to very exactly equal magnetic moments in the dissimilar directions. This is easily done by a few successive trials, to make them rest as nearly as possible perpendicular to the magnetic meridian.

4. Take two pieces of equal and similar straight steel wire, well hardened, each two centimetres long, and about .04 centimetres diameter. Magnetize them equally and similarly, and mount them on a suitable frame to fulfil conditions.

- 5 and 6. Call them R B and $R^1\ B^1$, B and B^1 denoting the ends containing true north polarity (ordinarily marked B), and R R^1 true south (ordinarily marked red). The small letters, $r\ b$, $r^1\ b^1$, mark on the same plan the polarities of $r\ b$ and $r^1\ b^1$.

3. The magnets R B, $R^1\ B^1$, are to be relatively fixed in line on their frame with similar poles next one another, at a distance of about two centimetres asunder, as thus, R B . . . $B^1\ R^1$, with B B^1 = two centimetres.

6. This frame is to be mounted on a geometrical slide upon the case, within which the astatic pair, $r\ b$, $r^1\ b^1$, is hung in such a manner that the line of R B, B R bisects $r\ b$, approximately at right angles, and that R B B R may be moved by a micrometer screw through about a millimetre on each side of its central position, the line of motion being the line of R B, $B^1\ R^1$, and the "central position" being that in which B and B^1 are equi-distant from the centre of $r\ b$.

7. A lamp and scale, with proper focussing lens if the mirror is not concave, are applied to show and measure small deflections as in my mirror galvanometers and electrometer.

* Communicated by M. Benjamin, Ph. B.