84.—EXAMINATION OF THE FISHERIES IN THE GULF OF MEXICO.

By SILAS STEARNS.

In the Gulf of Mexico an expedition should be at work the whole year in order to observe and investigate anything that might be important. The advantage of having a Gulf force entirely distinct from that of the Atlantic coast would be that it would be doing its most valuable work at the seasons when the latter would be needed at its stations, and also when most northern investigators would object to going to warm and sickly regions.

There would hardly be sufficient gain to compensate for the greater expense in having steam-power for a vessel engaged in this work, especially as the loss of time and the trouble in procuring fuel and in repairing machinery would probably bring the steamer to a level with a sailing-vessel. Nor would it seem advisable to employ a large vessel. The offshore work, such as beam-trawling, sounding, and the general fishing, is done mainly during the best weather, and could be done by a small vessel. Besides, a small schooner would do proportionately more than a vessel of several times her size, on account of her conveniences to handle. And then the schooner would be so much better adapted for duty in the bays and estuaries, by being able to carry the party and outfit to the near neighborhood of the oyster-beds, the bayous, and lagoons, and even into some of the rivers. It seems sufficient to say that the fishes of the Gulf coasts live mainly in shoal waters, and that if we are to study them in their element we must have a light-draft vessel to do so thoroughly. For the purpose I would select a center-board schooner of about 50 tons, which would draw but little water and have comfortable quarters for eight persons. Such a vessel, well equipped, would cost, new, about $5,000, and probably one could be bought for considerably less at second hand.

There is a schooner, named the Matchless, belonging to the Quartermaster's Department of the Army, now lying at the Pensacola navy-yard, which is soon to be sold to the highest bidder. She is of about 60 tons (new measurement), and is admirably adapted in every respect to the uses of the Fish Commission. Her draft is light (but 6 feet) and her accommodations are excellent. As she has been in constant use by the Army, her outfit is complete and in good condition. They sell her because there is no longer any duty requiring her at Dry Tortugas. Probably there will be but few bidders, and none prepared to pay more than $2,000. The monthly expenses of running a schooner of about 50 tons would be as follows: Mate, $50; cook, $40; four fishermen, at $25 each, $100; boy, $10; provisions, $150; chandlery bill, wear and tear, including also dockage and repairs, average, $75; total, $425. It would

also be desirable to have one or two young men, with some knowledge of natural history, to assist in the work of collecting and in keeping records of temperature, &c. With such an outfit work should be done entirely in the interests of the fishing industries, gathering information as to how they can best be protected and improved, &c.

I think that all intelligent persons who have followed closely the history of the fishing industries of the Gulf will agree with me that in almost every instance where a fishery has been pushed with any sort of vigor in a certain locality for several years the natural supply has been nearly exhausted. As instances of this I will mention the bay seine-fisheries of Galveston, Mobile, Pensacola, Choctawhatchee, Saint Andrew's, and Appalachicola Bays, and of the coast adjacent to Cedar Keys; the oyster fisheries of Mobile and Pensacola Bays and at several other points; the sponge and turtle fisheries about Cedar Keys and Key West; and also the red-snapper and grouper fisheries. All of these, by comparatively small demands upon them, have been quickly and surely reduced to less profitable and reliable conditions.

The shore bottom-fish, such as spotted trout, sheepshead, channel bass, mullet, and the large variety of smaller so-called "grass fish," have become so scarce along the Northern Gulf coast that they appear in small quantities in market only during a few weeks in the fall and spring, while but a few years ago they were abundant all winter, when there was an opportunity to send them to the interior. The grouper fishermen of Key West now have to go as far north as Cedar Keys to make a catch, and even then are twice as long on a trip as formerly. The Pensacola snapper fishermen are now obliged to sail 200 miles, and sometimes more, to the southeast to find any considerable quantity of fish, thus making the cost of the fish about one-third more than it was five years ago.

Most of the old fishing-grounds, which were large in extent and numerous, are nearly barren; but there are good red-snapper grounds south of the point now being fished over and reaching as far as Dry Tortugas. It is not practicable to extend the present voyages from Pensacola, and the product cannot reasonably be placed in the Western markets from any railroad connection south of Pensacola. As a consequence of the failure of these fisheries, at a time when the severe weather and ice prevents fishing on the Great Lakes and Western streams, the markets of a large part of the country that are beyond convenient reach of the Eastern Atlantic ports are but scantily supplied, and there is great clamoring for fish.

The migratory fishes, such as the pompano, bluefish, and Spanish mackerel, seem to be as abundant as formerly. They fluctuate in abundance, being rather scarce for a year or two and then returning even in larger quantities than ever. The present season has brought with it a larger run of Spanish mackerel than I have witnessed in nine years' experience. But these fishes generally come with the warm weather, when it has become impossible to send them in large quantities to the

interior, on account of the difficulty in transporting them in good condition to distant points, and because the Western markets are at the time glutted with cheaper fish from the Great Lakes. It would seem desirable to have some good fish, like the red snapper or striped bass, in such abundance during the winter months that the people of the South and West could depend upon a reasonably constant supply. The rapid exhaustion of the old red-snapper grounds leads me to believe that these fish are not holding their own against the inroads of man, and their habits and life history show that they cannot do so.

Aside from the work of ascertaining the best way to propagate Gulf fish, and of introducing new species there, the information so gained would be of value to the South Atlantic coast. The striped bass occurs in the Northern Gulf waters, but not abundantly. It is always in fine condition when captured, and is highly esteemed as food. Spawning adults and the young fish are occasionally taken. Besides trying to discover the best way to hatch the common native fishes and others, it would be well also to try to determine the results of the stocking with shad and salmon of the Southern rivers that empty into the Gulf. Probably an intelligent use of gill-nets at the mouths of these rivers at the proper season would be of value in that direction.

Any work of propagation done on the coast of Texas, or reliable information concerning the improvement of the fish supply of that State, would be heartily appreciated by a people who at present are in great need of good food-fish. While engaged in work of a practical nature, there would be opportunity for making large collections of specimens, and many things could be preserved that would be of scientific value to the National Museum, while a thorough study of the marine invertebrates would be of special value and interest, since so little has been done in that direction in these waters. The force at work would be qualified to make such collections. A small beam-trawl could be worked with good results, in the same manner as from the English sailing trawler; and if it was found advisable to have some hatching apparatus on board, there would be ample room for placing a small engine and hatching-jars.

PENSACOLA, FLA., *April* 20, 1885.

85.—PROPAGATION OF SALMON IN SALMON RIVER, OSWEGO COUNTY, NEW YORK.

By JOHN D. COLLINS.

I have been greatly interested in the spawning efforts of the *Salmo salar* in Salmon River for several years, and have wondered that the subject has not long ago attracted more attention. The following details are not upon personal knowledge, but were related to me by Mr. Cross, of Pulaski, N. Y., now deceased, who in his lifetime owned the