

SCRIPPS INSTITUTION FOR BIOLOGICAL
RESEARCH

LA JOLLA, CALIFORNIA, July 1, 1917.

To the President of the University,

SIR: In recognition of the present national emergency, this year's report is written more with reference to the possible usefulness of this Institution in the immediate future than as a narrative of work during the last twelve months. The time has come to apply the results of our research to the solution of the practical problems which confront us. It is undoubtedly incumbent upon the Institution to do its utmost to solve such problems as fall within the scope of its activities.

The Pacific Ocean, adjacent to the continent of North America, is very rich in plant and animal life. Until recently, however, the only commercial industry of large proportion comprised the salmon fisheries of the northwestern coast. The last few years have witnessed a rapid development of fishing industries. Whaling has been recommended now for human food instead of merely for oil. The long-finned albacore, *Thunnus alalunga*, canned and sold under the trade name of tuna, has become an important product. The California sardine, *Sardinella ceruleus*, constitutes as large a portion of the total pack as the albacore. At present there are twenty canneries on the coast of California. Nearly 600 boats are engaged in the fishing, and the value of the product of the last year exceeds \$4,000,000. A recent increase in the production of fresh fish should also be noted.

The work of this Institution must be to co-operate with the

National Bureau of Fisheries, the State Council of Defense, and the California Fish and Game Commission, in bringing about a greater use of sea productions for food, and in studying the problems likely to arise from this increased use. Two problems present themselves immediately. In the first place, more complete information is desired with regard to the distribution of fish, including such migratory species as albacore, yellowtail barracuda, and such all-year-round species as sardines, anchovies, smelt, and mackerel. In the second place, various problems relating to abundance and depletability are already appearing and will demand study in order to safeguard the interests of the future. We must determine what regulatory measures are desirable in the interests of conservation.

The war presents a possibility of some change from the present three-mile rule regarding coastwise fishing. The three-mile zone of maritime dominion has always been arbitrary and artificial, and the probability of some revision of international law following the war, affords an opportunity to introduce a zone founded on reason. The great fish-producing areas of the ocean are in the comparative shallow waters near the lands, and they are productive because they are near the lands. This fact suggests the conclusion that the edge of the continental shelf might be the limit of maritime jurisdiction.

The important additions to the Institution's "plant," as described in my last report, were practically completed by July 1, 1916. They were formally dedicated on August 9, 1916, the exercises being participated in by the Right Reverend Joseph H. Johnson, Bishop of Southern California; Benjamin Ide Wheeler, President of the University of California; David Starr Jordan, Chancellor Emeritus of Leland Stanford Junior University; D. T. MacDougal, Director of Botanical Research, Carnegie Institution of Washington; G. H. Parker, Professor of Zoology, Harvard University; and Wm. E. Ritter, Scientific Director, Scripps Institution. The event was held in conjunction with the San Diego meeting of the Pacific Division of the American Association for the Advancement of Science, and was attended by many visiting scientists.

The great usefulness of the new wharf has been increasingly manifest as the year's research has progressed. This usefulness is seen most exceptionally, perhaps, in connection with the laboratory experiments inaugurated this year by Dr. Esterly, with the end in view of bringing into correlation the results of statistical studies on plankton organisms and those of experimental studies on the activities of the same organisms. The utilization of the wharf by Mr. Michael in his statistical plankton studies, and by Professor Kofoid and Dr. Swezy in their structural and systematic work on the Dinoflagellates is hardly less significant. A paper setting forth some of the specially interesting subjects of inquiry which could be advantageously prosecuted in connection with the wharf will be published shortly.

The *Alexander Agassiz* was sold during the year, as this boat was too large and expensive to operate for the particular phase of the marine investigations we are now entering upon. A boat to take her place will be hired for this season.

The teaching experiment tried at the Institution for six weeks during the summer of 1916 was not successful in its primary aim. The hope was to attract a considerable number of science teachers whose major purpose should be to acquaint themselves with the investigations being carried on at the Institution, without reference to formal university courses and credits. While attendance was satisfactory from the local community, very few teachers appeared. Plans for the coming Summer Session provide for giving university credit to those who may care for it.

During the year the publication of the "*Bulletin of the Scripps Institution for Biological Research*" has been begun, the expense to be borne by the Institution. The numbers will be issued at irregular intervals, as matter is available, each number usually containing a single title. The hope is that the articles shall be composed and the distribution made with special reference to those members of the community who, though not themselves scientists, yet by reason of their callings or other interests, find it necessary to be informed on the results of scientific progress in certain directions. The development of the In-

stitution's aquarium and museum, now well advanced, also have educational as well as technical motives.

A systematic account of each line of research being carried on at the Institution such as has been given in previous reports is omitted this time. No essential departure from the plans and work of previous years has taken place during the past year. An important set of experiments on the inheritance of acquired characters, conducted by Dr. Sumner, has terminated this year with negative results. Although such an outcome of an elaborate experiment is always less cheering to the investigator than an affirmative outcome, even negative results, when clear-cut and decisive as these were, are highly important. It is as essential both for research and for human welfare, to know what heredity does not do as to know what it is capable of doing.

Respectfully submitted,

WILLIAM E. RITTER,
Director.