

Scripps Institution of Oceanography
La Jolla, California, April 25, 1944

To the President of the University of California

Sir:

I have the honor herewith to transmit:

REPORT ON THE ACTIVITY OF THE SCRIPPS INSTITUTION OF OCEANOGRAPHY,
BIENNIUM 1942-1944.

I. RESEARCH

General Research Activities -- The general research in the marine sciences at the Scripps Institution has been greatly curtailed in 1942-44 because work at sea was discontinued in July, 1941, because staff members are on war leave or have leave of absence to conduct war research at other establishments, and because more and more war research has been taken up at the Scripps Institution.

Mr. W. E. Allen was retired on June 30, 1943, but was retained on half time in 1943-44. This arrangement has made it possible for him to examine in detail a large number of the plankton samples which were collected on the "E.W.Scripps" cruises in 1938-41. His results will be of great help in planning post-war investigations at sea.

Mr. F. B. Sumner will retire on June 30, 1944, after having brought to a conclusion his experimental work on color changes in fishes. Replacement of Messrs. Allen and Sumner has to be postponed to the post-war period.

Together with Mr. Wesley R. Coe, professor emeritus in zoology, Yale University, Mr. D. L. Fox has continued studies on the California mussel and has, furthermore, participated in parts of the special war research mentioned below.

Mr. G. F. McEwen has also participated in war research and has, in addition, been engaged in the preparation of mathematical tables which will be of aid in dealing with problems encountered here or in other fields of work.

With field work discontinued and laboratory assistance reduced, Mr. E. G. Moberg has been engaged in an examination of field and laboratory data obtained previously.

Special Research Activities with Bearing on War Problems -- The special research falls into two groups, (1) studies which are directly related to military problems, and (2) studies which deal with conservation and proper utilization of resources.

1. In August, 1942, the Army Air Forces established a war project at the Scripps Institution which should compile various types of oceanographic information of military importance. Since July, 1943, when the oceanographic work was taken over by the Navy, the project has been sponsored by the U. S. Hydrographic Office. Mr. McEwen and, later, Mr. H.U. Sverdrup have been in charge of the project the nature of which can not be further discussed. In the spring of 1944 a number of special studies were conducted in cooperation with the Woods Hole Oceanographic Institution. At times more than thirty persons were engaged on these projects.

2. Since the summer of 1942 work on the role of bacteria in petroleum formation has been conducted by Mr. C. E. ZoBell and his collaborators. Supported in part by a grant from the American Petroleum Institute, this grant has been increased once and plans for further increases have been advanced. The scope of the work has been expanded to consider in general the importance of bacteria in petroleum deposits and has in this respect led to several important results, some of which will be protected by patents against exploitation by individuals. This work has no direct bearing on war problems but

but has been given a very high priority because of its probable importance to the future rational utilization of petroleum resources. Part of the work which touches upon physiological problems has been carried out by Mr. Fox.

Experiments with various coatings for prevention of fouling and corrosion of submerged surfaces have been carried out by Mr. Fox whose results have been examined with great interest by representatives of the Navy.

Studies of the red alga, Gelidium, from which agar is extracted were started by Mr. M. C. Sargent in the summer of 1942 and during the remainder of the biennium have been continued by the Chinese marine botanist, Mr. C. K. Tseng. Agar which is indispensable in bacteriological laboratories and widely used in industry was formerly imported from Japan. The Gelidium, however, grows abundantly off the coast of California, but harvesting is expensive because the alga must be collected by divers.

Mr. Tseng has examined the requirements of the alga by conducting experiments in the laboratory and by studying the growth under natural conditions. The work has been conducted in cooperation with the U. S. Fish and Wildlife Service which has assigned from one to two of its employees to work at the Scripps Institution. These workers have primarily been concerned with the chemical characteristics of the agar obtained from the Gelidium and other algae. Mr. Tseng is planning large-scale culture experiments in order to ascertain whether the Gelidium can be grown commercially in salt-water basins.

During 1942-43 studies of the effect of kelp cutting on the growth of the kelp plant and on erosion of beaches were continued by Mr. J. F. Wohnus, employed on a fellowship established by the Kelco Company of San Diego. No evidence was found to support the contention that the cutting of kelp accelerated the erosion on sandy beaches inside the kelp beds. Nor

could it be shown that rational cutting had any detrimental effect on the kelp beds. Fluctuations related to causes beyond human control appeared far greater than any arising from human activity. Further studies along these and other lines are desirable but the work had to be discontinued since Mr. Wohnus was commissioned into the Navy and since no qualified person was found who could continue the work.

The library of the Scripps Institution has filled a large number of requests for special literature and charts needed in connection with war problems.

The book, "The Oceans: Their physics, chemistry, and general biology," by Messrs. Sverdrup, Johnson, and Fleming (N.Y., Prentice Hall, 1087 pp.) which was published in December, 1942, has found wide and unexpected use in connection with a number of war activities. During the first year after publication its sale was for that reason restricted to the United States and Canada.

II. Instruction -- The number of graduate students at the Scripps Institution has been reduced, but a few continue work towards their doctor's degree in Mr. ZoBell's division. Mr. Sverdrup has participated in the training of meteorologists in the Physics-Meteorology Department at UCLA, and has given four brief courses in special forecasting to small groups of meteorologists in the Army and the Navy.

III. Grounds and Buildings -- In spite of labor shortage it has been possible to obtain the necessary employees for maintenance of the grounds and buildings. A program for improving the grounds by systematic pruning and trimming has been continued with considerable success.

The pilings of the pier were badly damaged during a storm at the end of December, 1942. Funds were placed at the disposal of the Institution for making repairs but this work has progressed very slowly because it has been

impossible to procure the added labor. The most urgent repairs have been made, however, so that the pier is in no immediate danger, and it is hoped that progress will be made during the coming year.

IV. Post-war Plans -- It is difficult to anticipate the future development of the marine sciences because the numerous and often unexpected applications to military problems have aroused an interest which perhaps will persist after the war and may lead to great expansion of oceanographic research. If so, the Scripps Institution of Oceanography should participate in a prominent place and provisions should be made for adequate expansion of its staff and facilities. At all events, the staff should be restored to its pre-war state so that as a minimum the coordinated investigations of the waters off southern California and fundamental research in the laboratories can be continued.

Respectfully submitted,

H. U. Sverdrup
Director

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