

**MARINE BIOLOGICAL AND OCEANOGRAPHIC INSTITUTIONS
OF THE WORLD**

**II. RESEARCH IN MARINE BIOLOGY AT THE SCRIPPS
INSTITUTION OF OCEANOGRAPHY**

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THE Scripps Institution of Oceanography of the University of California had its genesis in the search for a seaside station at which field studies in marine biology could be most profitably conducted. Despite the inclusion of other areas of research and teaching in the Institution's program, the investigation of the many and complex manifestations of life in the sea continues to occupy a prominent role.

The Institution is an outgrowth of the program of field investigations on the animal life of the Pacific Ocean begun in 1892 by the Department of Zoology of the University of California under the leadership of Professor W. E. Ritter. A summer field station was established each year at a locality along the California coast. At first, financial support came in small sums from numerous persons interested in the work, from alumni of the University, and to some extent from the University itself. The interest of Miss Ellen B. Scripps and Mr. E. W. Scripps began in 1903 when the field station was moved from San Pedro to San Diego. Most of the funds for the physical development of the La Jolla campus and for support of the scientific work during the early years was given by the Scripps family. With the growth of the Institution, the State of California and the Federal Government have borne an increasing proportion of the total cost.

For several years, the enterprise was carried on as the Marine Biological Association of San Diego, a corporation which had no official connection with the University of California, though such a relation was looked forward to and provided for in the articles of incorporation. The Institution became an integral part of the University in 1912, when the property and management were transferred to the Regents of the University, the name of the foundation being then changed to the Scripps Institution for Biological Research. The scope and character of the research program ultimately focused on all aspects of the study of the sea and this fact was formally recognized on October 13, 1925, when the name was changed by the Regents to the Scripps Institution of Oceanography.

The Scripps Institution is divided into four academic divisions: Marine Biology, Marine Geology and Geochemistry, Marine Geophysics, and Marine Resources. Supporting activities include marine facilities, machine and electronic shops, a library, business and accounting offices, a purchasing office and stockroom, and an aquarium-museum.

Of the Institution's staff of 600 persons, approximately 75 are associated with the Division of Marine Biology. Of these 75, about one-third are senior scientists. During the spring semester of 1959, 47 graduate students were enrolled at the Institution; 24 of these were working towards higher degrees in marine biology.

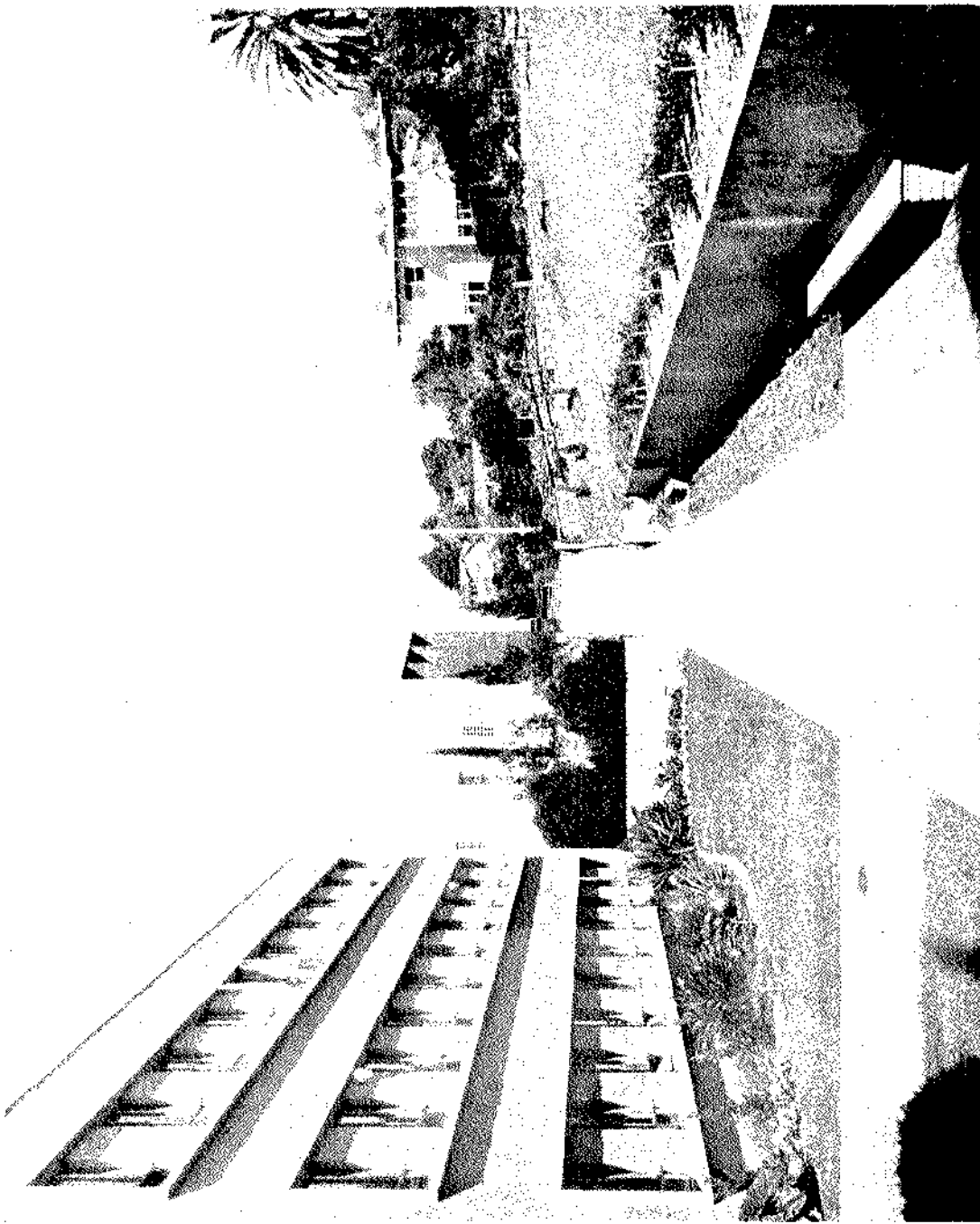
Chairman of the Division of Marine Biology is Claude E. ZoBell. Some of the activities of the Division have recently been described (Hubbs, *A. I. B. S. Bulletin*, Vol. 6, No. 1, pp. 11-13):

'Biological activities at Scripps Institution are diverse, though all focused on marine problems. The program in biochemistry, headed by Denis L. Fox, stresses such subjects as biochromes and comparative biochemistry of marine organisms and the role of particulate organic detritus in their nutrition. Research in microbiology, under Claude E. ZoBell, has dealt with the constitution of the marine bacterial flora, with the role of bacteria as geochemical agents, and with the biochemistry of marine micro-organisms. It now stresses the physiology of bacteria that live under enormous pressures at great depths of the sea. The marine botany section, led by Francis T. Haxo, emphasizes problems related to the basic productivity of the seas, but deals also with other phytoplankton problems and with the physiology and biochemistry of attached marine algae. The work in invertebrate zoology, administered by Martin W. Johnson, deals chiefly with the zooplankton, with emphasis on systematics, life histories, quantitative distribution, and relations to oceanic currents, water masses, and other ecological factors. Dr. Johnson's pioneering work on the deep scattering layer is being extended by special projects. The studies in marine vertebrates, headed by Carl L. Hubbs, deal with the systematics, ecology, and distribution, habits, and reactions of marine vertebrates, both of coastal waters and the high-seas. Included currently is a study of the ecology of man during past periods of the eruption of populations along the coast. The newest division, marine genetics, being developed by Adriano Buzzati-Traverso, deals not only with the heredity of certain marine organisms, but also with population dynamics and evolution.'

Since the above was written, there have been several additions to the divisional staff, one being the physiologist, Per F. Scholander, who is studying the secretion of gases in the swim bladders of fishes, the effects of prolonged diving on cold-blooded animals, and the adjustment to cold of Arctic fishes.

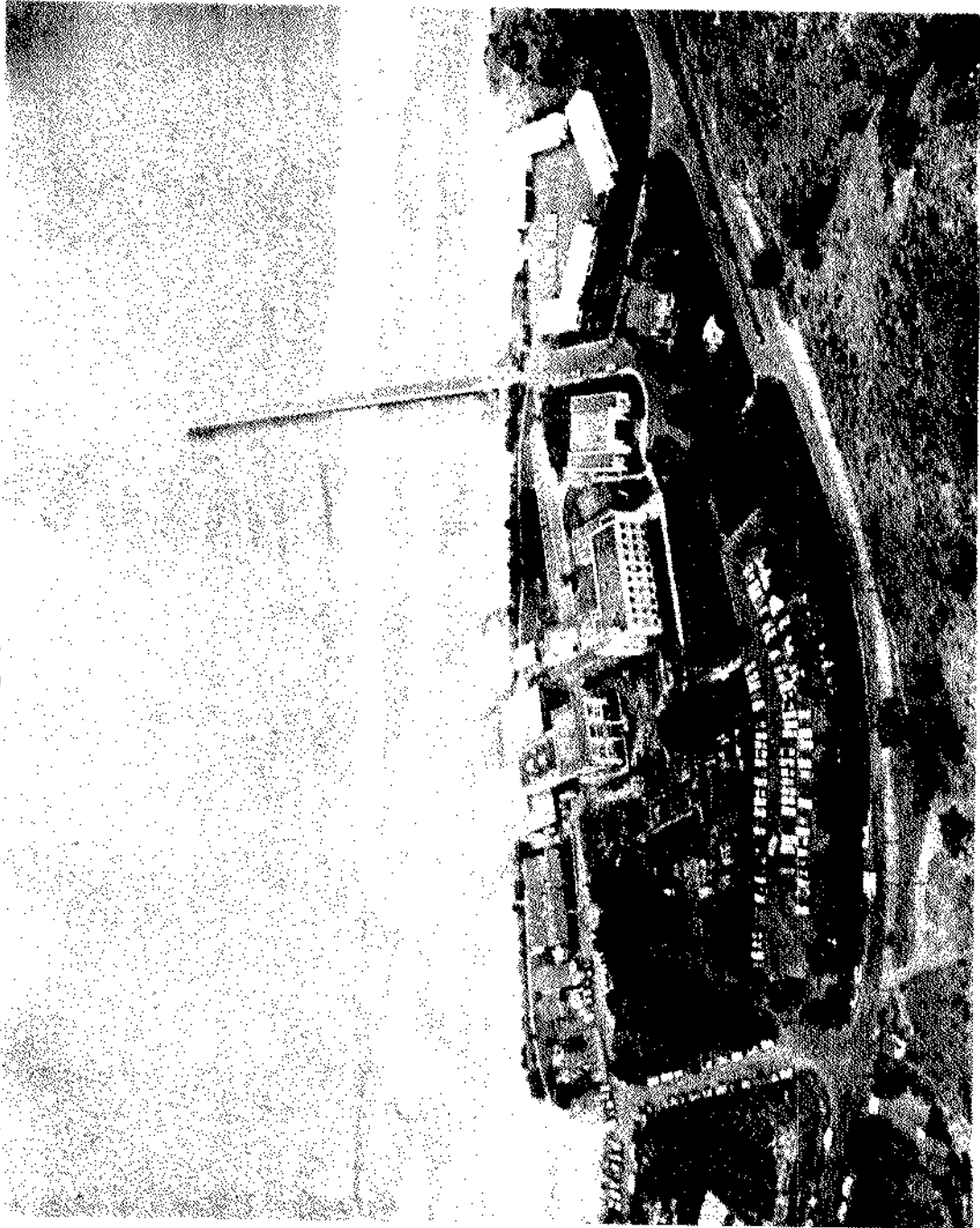
Buzzati-Traverso has spent the past year on leave in Italy with the Italian Atomic Energy Commission, the work of the marine genetics laboratory being carried on under the direction of William L. Belser.

One notable development in research in marine biology at the Institution during the past decade has been the eager utilization of self-contained underwater breathing apparatus in field studies of marine ecology. Several scientists and technicians in the Division have been trained under the Institution's program in diving and the equipment has made possible several studies of a type impossible before. Among these is an extensive investigation of the ecology of the beds of the giant kelp, *Macrocystis pyrifera* off California which is directed by diver-scientist Wheeler J. North. Another investigation is a study of the ecology of the sand bottom conducted by E. W. Fager,



The northern part of the campus of University of California's Scripps Institution of Oceanography. At the left is shown a portion of William E. Ritter Hall, a laboratory and office building; at the head of the steps is the entrance to the Thomas Wayland Vaughan Aquarium-Museum. The frame building at the right houses the headquarters of the La Jolla Biological Laboratory of the U. S. Bureau of Commercial Fisheries. The Laboratory works with the Institution in a co-operative study of the pelagic fisheries of California, a program in which three other research groups are also joined.

—University of California, La Jolla



Closely associated with the Institution are three governmental laboratories specializing in fisheries biology. All have their headquarters at the Scripps Institution. One is the Inter-American Tropical Tuna Commission, the others are the San Diego and La Jolla Biological Laboratories of the U.S. Bureau of Commercial Fisheries. The first two agencies are engaged in studies of the tuna. The La Jolla Laboratory, along with the Scripps Institution and three other agencies, is engaged in the broad studies of the pelagic fishes off the California coast that is called the California Co-operative Oceanic Fisheries Investigations (CCOFI).

An integral part of the Institution are two programs dealing with fisheries, emphasizing the oceanic environment as it affects the fisheries. These are the Marine Life Research Program, headed by John D. Isaacs, which is the Institution's component of the CCOFI program, and the Scripps Tuna Oceanography Research Program, which is headed by Maurice Blackburn.

Among the Institution's resources are its fleet of seven research vessels, several of them capable of traveling to any part of the world. They have undertaken more than 20 long cruises in the Pacific during the past decade, ranging as far as Japan and the Tonga Islands. More and larger ships are in prospect for the Institution. In the planning stages is an expedition which would take one of these new vessels on a major expedition to the Indian Ocean, in the early 1960s, as part of an international program of joint exploration of that fascinating and little-explored area.

Also being planned is a project that would take one of the smaller ships to the Gulf of Thailand for two years under the auspices of the Thai Government and the U.S. International Co-operation Agency. The purpose would be to conduct studies of the marine resources of the Gulf with an aim to suggesting methods of future exploitation.

At the time of writing, two of the Institution's ships are engaged in an expedition to the Gulf of California, the narrow 'Sea of Cortez' that lies between the peninsula of Baja California and the Mexican mainland. Off the tip of Baja California, dredge hauls have retrieved specimens of *Neopilina galathea*, the primitive mollusk first found on the Danish *Galathea* Expedition in 1950-52.