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THE HOPKINS SEASIDE LABORATORY.

BY DAVID S. JORDAN.

ONE of the best equipped and most favorably situated of the marine laboratories for research is the Hopkins Seaside Laboratory on Monterey Bay in California. This institution is an outgrowth from the biological departments of the Leland Stanford, Jun., University, its equipment having been provided for by the generosity of Mr. Timothy Hopkins, one of the trustees of the University. The laboratory is situated on a rocky point of land known as Point Aloha, which juts into Monterey Bay near the village of Pacific Grove. The laboratory is a two-story, frame building sixty feet by twenty. On each floor the many windows make the sides of the building virtually of glass. The lower floor is devoted to aquaria and to work in connection with aquaria. The upper floor is fitted up for advanced research, with private rooms for workers in special fields. On the lower floor are seven aquaria provided with running water, besides various glass jars and similar vessels used for the study of smaller animals.

The fauna of Monterey Bay is peculiarly rich, as the life histories of the animals of this region have been scarcely studied by zoologists. The laboratory, therefore, offers special attractions to naturalists, particularly to workers on tunicates, jelly fishes, star-fishes, fishes, and nudibranch mollusks. The material for zoological purposes is extremely abundant, and one singular feature of the life of this region is the immense size to which many animals grow as compared with the size reached by their relatives in the Atlantic.

In the aquaria I notice many specimens of salpa, large transparent tunicates, reaching a length of four or five inches. There are nudibranch mollusks (*Aplysia*) nearly a foot in length, and a twenty-armed star-fish (*Pycnopodia*) whose span covers the whole height of one side of the aquarium. This creature has been timed in making a circuit of the four sides of the aquarium, covering the distance of about nine feet in just four minutes. Immense jelly fishes which will almost fill a bushel basket are also very common, and sea anemones, reaching a size by which the largest of the Atlantic seem like marigolds compared with sunflowers. Tunicates, chitons, limpets, sea urchins, sea anemones, octopus, and squid exist in great abundance and variety. Among the fishes are also many forms of interest in the aquaria, numerous species of blennies and sculpins abounding about the rocks. The blue hag-fish (*Polistotrema*) occurs in great abundance. This is an eel-shaped fish about a foot to a foot and a half in length, which lives as a parasite in the bodies of other fishes. It enters at the eye or at the throat or some other soft place, and then by means of the rasp-like teeth, makes a hole in the body of its host and in time without breaking or disturbing the bones or viscera of the unfortunate animal, it will devour the entire muscular system of the fish on which it feeds. Many of the larger flounders and like fishes obtained in the Bay of Monterey are found to be half-devoured or reduced to mere hulks by the operation of this singular fish. The locality is especially favorable for the study of the viviparous surf-fishes and rock-fishes. The huge torpedo or cramp fish, which is found across the bay about Soquel, also invites investigation. As I write, a grampus 12 feet in length is brought in in a dray-wagon by a Portuguese fisherman from Monterey, while a constant stream of objects of interest comes in from the Chinese fishing camp at Point Alones. The marine flora of the Bay of Monterey is equally interesting. About one hundred and twenty species of sea weeds have been collected by Mr. Bradley M. Davis, who has charge of the work in botany. These range in size from the giant kelp, which here has a length of thirty or forty feet, down to the minute algæ about the wharves.

The laboratory is well supplied with collecting apparatus, with microscopes, reagents, embedding apparatus, and the usual material for study, this being brought from the laboratories of the Stanford University. About thirty students have been in attendance during the summer, some of these being advanced workers in different departments, some of them teachers and the others students from the laboratories of the university.

Among the pieces of special work which may be noticed are the studies of Professor Frank M. MacFarland on the egg segmentation of the nudibranchs, those of Frank M. Cramer on the nervous system of the limpet, those of Leaverett M. Loomis on the sea birds of Monterey Bay, those of Wilbur W. Thoburn on the rock-fishes, those of Miss Flora Hartley on the anatomy of the abalone, and those of Mr. Charles W. Green on hydroids.

The instruction for the summer has been in the hands of Professors Charles H. Gilbert and Oliver P. Jenkins, of the chairs of zoology and physiology respectively, in the Stanford University, assisted by Bradley M. Davis and Wilbur W. Thoburn, graduate students. The purposes of the laboratory as set forth in the circular are: To supplement the work given in the regular courses of instruction in the zoological, botanical, and physiological departments of the university under the favorable conditions of such a station; to provide facilities for investigators who are prepared to make researches in marine biology, for which the Pacific Coast offers exceptional attractions, in that its field is very rich and is as yet largely unworked, to afford an opportunity to those, especially to teachers, who desire to become acquainted with marine animals and plants, and to learn the practical methods of their study.

In respect to the abundance of material and newness and freshness of the fauna to be studied as well as in the matter