

First *Hero* Cruise in the Southern Hemisphere*

Departing from Miami, Florida, on October 23, 1968, *Hero* proceeded to Valparaíso, Chile, to begin a cruise in southern Chilean waters that lasted from November 12 to December 11. The cruise was undertaken to study the marine mammals of southern Chile, particularly the distribution and variation of small whales, porpoises, and seals. Other objectives

*Extracted from report prepared by Dr. Kenneth S. Norris, senior scientist on the cruise.

included investigations of the chemistry of vision in marine mammals; the collection of materials for gross microscopic and ultrastructural studies of the porpoise ear and eye; the accumulation of information on the life history of the mammals, including their parasites, sexual cycles, and stomach contents; research on porpoise sound processing by means of brain implants on anesthetized animals, and sound-velocity and -dispersion measurements on porpoise tissues thought to be involved in sound transmission; and the recording of underwater sound emissions.

Dr. Kenneth S. Norris, Director of the Oceanic Institute at Waimanalo, Hawaii, and Professor of Zoology at the University of California, Los Angeles (UCLA), served as senior scientist on the cruise. Other participants from UCLA included Edward W. Shallenberger, Robert Barrett, and Kenneth A. Bloome. Also aboard were William E. Schevill, Woods Hole Oceanographic Institution; William N. McFarland, Cornell University; George W. Harvey, Oceanic Institute; William Watkins, Woods Hole Oceanographic Institution; Anelio Aguayo, Director of the Estación de Biología Marina, Montemar, Chile, and Michael Barrett, UCLA.

In addition to the primary objectives, the expedition obtained collections for specialists not directly involved in the cruise. These collections included plants, hagfish, diving petrels, skulls of pinnipeds, and visual pigments of marine vertebrates other than cetaceans.

The cruise yielded an unexpectedly low number of cetaceans, but the complex and obscure genus *Lagenorhynchus* was observed, and a good series of specimens was obtained, allowing study of pattern variation and osteology in *L. australis*. Two specimens of the little-known *Cephalorhynchus commersoni* were recovered from the Straits of Magellan. Sightings of the sea lion *Otaria byronia* and the fur seal *Arctocephalus australis* numbered 2,400; 45 new localities, mostly of *Otaria*, were recorded. Skeletal materials from an entire stranding of the southern pilot whale were obtained. The retinas from eight porpoises were dark-adapted and frozen for later analysis at Cornell University.

The neurophysiological work suffered from the relative scarcity of animals. In the single successful anaesthesia that was performed, a small male of *L. australis* was implanted and recordings made of cerebral signals for about 30 minutes until the animal died.

Many attempts were made to record underwater sounds of marine mammals from *Hero* and the whale-boat, both of which proved to be good listening platforms. When *Hero* was on "silent ship" with all rotary machinery stopped, no ship-generated sounds could be heard. Recordings were obtained from both porpoises and sea lions.

Plants were collected from 26 localities and 1,731 specimens were pressed, dried, and labelled. Among the previously uncollected localities was the extremely interesting Islas Barnevelt east of Cape Horn, Isla Aguirre, and Isla London, and all outlying islands to the Península Brecknock. The plants are presently being catalogued and studied by Mrs. Natalie Goodall of Estancia Haberton, Tierra del Fuego, Argentina. They will be forwarded to Dr. Frederick G. Meyer, Research Botanist, U.S. National Arboretum, U.S. Department of Agriculture, Washington, D.C., who is arranging for their study and distribution.

Twelve collections (several hundred individuals) of hagfish were made for Dr. Carl Hubbs, University of California, San Diego, from the Golfo del Corcovado to Puerto Maxwell, a few miles north of Cape Horn. Visual pigments were obtained from fishes, the steamer duck, kelp goose and magellanic penguins. Five diving petrels were obtained for Dr. Braulio Araya, and a new locality for the very rare magellanic woodpecker was recorded. A few miscellaneous collections were made of invertebrates as well as amphibians, lizards, and tadpoles.

Ten cetaceans (porpoises) and other biological materials from the cruise are either deposited in the United States National Museum or distributed to appropriate scientists for study. The plant collection will be deposited ultimately in the Berkeley Herbarium, at the University of California.

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