Announcement of Expedition Ursa Major

July 29, 1964

Somewhere in the vast reaches of the Pacific Ocean there is an abrupt change of marine life. For thousands of miles the ocean teems with marine organisms in hundreds of forms and then, as if one were to suddenly drive from a lush rain forest on to the Mojave Desert, it becomes a submarine wasteland by comparison.

Expedition Ursa Major, a study group of scientists and technicians from the University of California's Scripps Institution of Oceanography in La Jolla, California, have taken up the enormous task of exploring this so-called "faunal boundary." The study will extend from August 1 to October 2, 1964.

The expedition has as its head Dr. John A. McGowan, 40, Assistant Professor of Oceanography at Scripps Institution of Oceanography. Dr. McGowan is a researcher in the field of tropical marine invertebrates and is familiar with the Pacific, having carried out research in the islands of the U.S. Trust Territories and other areas of the Pacific. He is currently involved in the study of the distribution and abundance of zooplankton, floating and drifting animal life, in the ocean.

To obtain the data necessary on the first leg of the study, nets will be towed through the water from the ship, nets the scientist dips in and out of the water will be used for specific experiments at night, and water samples will be taken at every 20 to 80 miles. Similar yet slightly modified procedures will be used for legs two and three.

Upon returning to the Scripps' laboratories, the scientists will use the principle of regression analysis, the comparing of oceanic characteristics on charts and graphs. Regression analysis involves the use of statistics and mathematical equations to determine the factors involved in the existing conditions as compared to ordered, "ideal" conditions. Such factors as salt content, mineral content, and temperature are studied with careful observations as to which organisms Live in the given area.

High-speed computers will be used to solve the complex equations twelve at a time, thereby conserving much manpower.

Dr. McGowan points out that the expedition will consist of three legs. Leg one will leave San Diego on August 1, and will head out for Kodiak Island arriving on August 15. Leg two will leave Kodiak August 18 and arrive in Honolulu, Hawaii, September 12. Then, with most of the scientists flying back to San Diego, the ship, Alexander Agassiz, will make the return trip with only a skeleton crew of 18 to operate her.

One of seven ships in the Scripps' fleet, the Alexander Agassiz is 179' 10" long and displaces 825 gross tons. The converted Army cargo ship is powered by two General Electric diesel engines with a total horsepower rating of 950. She was purchased in 1962. Her Captain will be Frank Miller, a 12-year veteran of Scripps service.

Specifically, the route of the Alexander Agassiz will trace a line west into the Pacific to a point above the Hawaiian Islands and then head north to Kodiak Island, off the coast of the Alaska peninsula, the headland mass of the Aleutian Island chain.

Then, the second and most important leg of the expedition will retrace the northward journey of the first leg and continue southward to the Hawaiian Islands, completing the formation of a "T" shape. The third leg will be a direct line to San Diego.

Dr. McGowan will join the expedition at Kodiak and serve as leader for the second phase of the journey.

Basically, this "expedition will make two transects (lines or belts) of the Sub-Arctic Convergence and the North Pacific Drift, (two well known oceanic current-systems.) The primary purpose is to acquire detailed biological, physical, and chemical data at closely-spaced station intervals in an area of abrupt faunistic change. This faunal boundary is a major feature of the biology of the Pacific but has never been studied in detail."

Dr. McGowan defines man's interest in Biological Oceanography, typified by expedition Ursa Major, as wanting to "understand the distribution and abundance and community structure patterns of organisms in the sea and the factors responsible for the maintenance of these patterns." In gaining this knowledge, man learns about such things as what kind of fish populate an area during a certain season, or where the larger marine organisms gain their food.

The expedition carries the curious tag of Ursa Major. Why? Dr. McGowan feels numbered expeditions lack personality. Ursa Major is Latin for Great Bear, the northern constellation the Alexander Agassiz will use for navigational sightings. And what's more, the group's leader points out that the famous bears of Kodiak Island fit nicely into the picture.

The Marine Life Research group, an entity itself at Scripps, will have eight scientists on board the ship. Dr. McGowan is a member of this group.

To gather the samples, improved tools have been devised for the trip:

1. A plankton-catching net which will gather samples for statistical analysis.

2. A device for obtaining dissolved organic carbon in water.

3. A device for obtaining water for the age-dating of Carbon 14.

The fourth tool is the result of much intensive research. At Scripps Institution scientists have learned that certain algae, simple aquatic organisms, and bacteria gain nourishment by ingesting certain nutrients.

Upon the ingestion of such nutrients-- vitamin B-12 for example, the organism reproduces at a certain rate. The more vitamins a certain algae eats, the more populous its numbers become.

This principle is utilized by Scripps' scientists in feeding special algae the very sea water collected on the expedition.

Let us say a certain strain of algae (fungi are also used) thrives on vitamin B-12. When a sample of sea water Prom a specific location in the Pacific is placed with the algae it then allows the organism to reproduce at a certain rate. The scientist looks on his information chart and can say that so many reproductions means there is just so much vitamin B-12 in the water sample. Hence, a relatively accurate and simple analysis of the sea water has been made with the help of simple organisms.

Another ingenious aid in uncovering the enigmas of the sea is used to trace the underwater ocean currents. A special indicator is dropped into the water, where it sinks to a predetermined depth with the help of an old surplus World War II parachute which upon opening, soon catches the current. A radar reflector bobs to the surface on a long line connected to the parachute and is easily detected on the ship's radar scope. Whole fields of the

indicators are seeded into an area and then traced this way, giving the direction, speed, and depth for the current involved.

Dr. McGowan, who is presently serving as consultant to the Indian Ocean Program, with field headquarters in Cochin, India, is concerned with sampling statistics involved in such studies as Ursa Major. The devices used in gathering the data aren't the problem; such matters as where the samples are gathered and at what time they are collected and at what depths present the scientists with their most perplexing problem.

"Sampling statistics," says Dr. McGowan, "have got me worried." There is a definite need for improvement in this area of marine biology. Perhaps expedition Ursa Major has the answers to the multitude of questions Scripps' scientists are asking. But more than likely, say the students of the sea, a few may be answered, but more questions will be there to take their place.

The oceanic boundary between the many and the few is there, waiting patiently in the Pacific, for the inquiring mind of man to challenge its age-old mysteries and take another step forward towards unravelling the ways of nature.

Ursa Major is such a step.