

Argo (ship) returns from Deep Sea Drilling Project

February 19, 1970

The research vessel Argo of the University of California, San Diego's Scripps Institution of Oceanography arrived back in San Diego, Thursday, February 19, and berthed at Scripps' Nimitz Marine Facility after completing successful geological and geophysical surveys of ten additional Pacific Ocean sea-floor sites selected for drilling in the Deep Sea Drilling Project (DSDP).

Last year, in Expedition Scan, scientists aboard the Argo selected 23 sites for DSDP operations between here and Japan.

The second part of Expedition Scan, which began at Papeete, Tahiti, last mid-October, logged 21,098 miles between Tahiti and Balboa, Canal Zone; from Balboa westward and thence to Acapulco, Mexico; and from Acapulco to San Diego.

The site-selection work involved investigating sediments and geological formations into which the Glomar Challenger drilled during her Pacific Ocean operations in 1969.

The Glomar Challenger completed that work recently and just last week left Galveston, Tex., for Miami, Fla., on the first leg of an extended drilling program that will eventually take the ship into the Atlantic, Indian, and Pacific Oceans, and the Mediterranean Sea.

Argo's site-selection work was supported by the National Science Foundation (NSF) and the Office of Naval Research (ONR). The DSDP, which is part of NSF's National Ocean Sediment Coring Program, is conducted under contract by Scripps Institution; JOIDES serves in an advisory capacity to the DSDP.

Dr. Russell R. Raitt, professor of geophysics; and Drs. John G. Sclater and Gerald B. Morris, both assistant research geophysicists, served as chief scientists between Tahiti and San Diego. Capt. John W. Bonham was master of the Argo during the expedition.

Using reflection profiling, echo-sounding, and a magnetometer, scientists aboard Argo surveyed two drilling sites northeast of Tahiti within two weeks of the ship's departure from Papeete on October 18.

The ship then stopped briefly at Pitcairn Island to disembark four U.S. Air Force personnel who had been conducting a geodetic survey and take on their replacements.

As the Argo was about to depart Pitcairn, Dr. Raitt suffered a broken leg and Dr. Morris replaced him as chief scientist for the remainder of Legs 8 and 9 of the expedition.

Accompanied by a UCSD colleague on the expedition, Dr. Hugh Bradner, professor of engineering physics and geophysics, Dr. Raitt was taken by the Argo from Pitcairn Island 300 miles distant to Mangareva Island, and then airlifted by the French military to a hospital in Papeete. The two men then flew back to San Diego. Dr. William D. Armstrong, the Argo's physician, had set Dr. Raitt's leg in a cast for the trip.

Dr. Raitt praised the speed and efficiency of the French Polynesian government and the French military in arranging for his and Dr. Bradner's evacuation from Mangareva Island to Papeete.

The evacuation of the two men concluded, the Argo then headed southwest of Mangareva a distance of 600 miles to survey a possible active undersea volcano that rises about 13,000 feet from the seafloor to within 125 feet of the surface.

This volcano had been discovered several months earlier by Dr. Rockne Johnson of the University of Hawaii. He had noticed that seismic disturbances or rumblings appeared to originate in this area and had predicted the volcano's existence from seaquake records.

Rock samples were dredged from the top of the volcano and water samples taken from its top and sides, but listening devices lowered into the water failed to detect any extraordinary sounds.

"We were disappointed not to hear anything unusual, but just as glad no larger disturbances occurred while we were in the area," Dr. Morris said.

No drilling sites were discovered enroute back to Papeete that met DSDP drilling requirements and Leg 8 ended at Papeete on November 12.

On Leg 9, between Papeete and Balboa, the scientists surveyed six drilling sites in the thick sediment lying along the equator.

It was during this period that extensive refraction work was conducted that normally requires at least three ships.

The scientists and technicians continued using a technique Scripps developed earlier, however, in which only one vessel is needed. In this, the Argo dropped explosive charges; moored floating buoys as much as 50 miles away would act as listening stations. The buoys were equipped with underwater listening devices and radio transmitters that sent the received signals back to the Argo.

Because of the line-of-sight limitations imposed by ship-mounted antennas at the very high frequency used by the buoy, the radio transmitter was attached to a line to a balloon some 600 feet above each buoy to extend the buoy's range.

"We used some 13 combination balloon-buoy packages during Leg 9," Dr. Morris explained.

"We found that numerous problems could, and did, arise with such a complicated system. The balloons occasionally fell victim to intense squalls, sharks bit through the mooring line setting the buoy adrift, and fish actually ate large parts of the styrofoam floats. In spite of such difficulties, however, the system usually worked."

Among those aboard on the Papeete-Balboa leg of the expedition were Phyllis Helms, micropaleontologist with Scripps; Helen Kirk, specialist in marine geophysics, and Delpha McGowan, laboratory technician. The latter two did seismic refraction work and Miss McGowan also served as marine technician. Fred Dixon, principal marine technician, was aboard from Tahiti to San Diego.

During Leg 10, between Balboa and Acapulco, two DSDP site surveys were made over the East Pacific Rise, off South America.

Many heat-flow measurements were taken on this run. Twenty geochemical stations were occupied and hundreds of seawater samples taken to measure helium, helium-3, argon, nitrogen, silica, total carbon dioxide, radium, and radon concentration and the isotopic composition of dissolved oxygen and carbon.

These samplings and measurement programs were under the direction of Dr. Harmon Craig, professor of geochemistry, assisted by Ray Weiss, C. Y. Chung, and Peter Kroopnick, Scripps graduate students.

It was during the Acapulco-San Diego leg that a U.S. Coast Guard plane out of San Francisco air-dropped six pints of blood for an Argo crew member, Willard Strickland, who had developed internal bleeding.

Dr. William Orris, who had replaced Dr. Armstrong as physician aboard the Argo, gave two blood transfusions to Strickland from crew members prior to the air-drop of additional blood. Strickland's condition improved, but the ship was diverted to Manzanillo, Mexico, where the patient was hospitalized briefly before he flew home to San Diego.

On the Acapulco-San Diego leg, heat-flow measurements, core samples, and mid-water trawls were taken.