Two Expeditions Announced by Scripps Institution

Between 15 June and 23 August the University of California's Scripps Institution of Oceanography at La Jolla, Calif., will send the *Spencer F. Baird* on an expedition to the central and equatorial Pacific area lying between Hawaii and the U.S. mainland. The purposes of this cruise are twofold, biological and geological. The cruise will be divided into three phases. Phases 1 and 3 will be devoted to biology and hydrography; phase 2 is primarily geological.

Sampling in phases 1 and 3 will consist of a series of deep mid-water trawls, opening-closing plankton tows, and hydrographic casts. It is anticipated that several of the hydrographic casts will be made to the maximum possible depths and, in addition, that a few replicate casts may be made. A series of gravity cores will also be taken.

Phase 2 will be devoted to an intensive bottom coring program to the south of Hawaii. Sediment samples collected by the *Challenger* in 1875 and the "Mid-Pacific" expedition in 1950 indicate the presence of extensive or numerous outcrops of fossiliferous Lower Tertiary sediments. Some 60 sediment cores will be taken in this area in an attempt to determine the conditions under which the older sediments outcrop. From this it may be possible to deduce some of the characters of the physical agents moving sediments in this area.

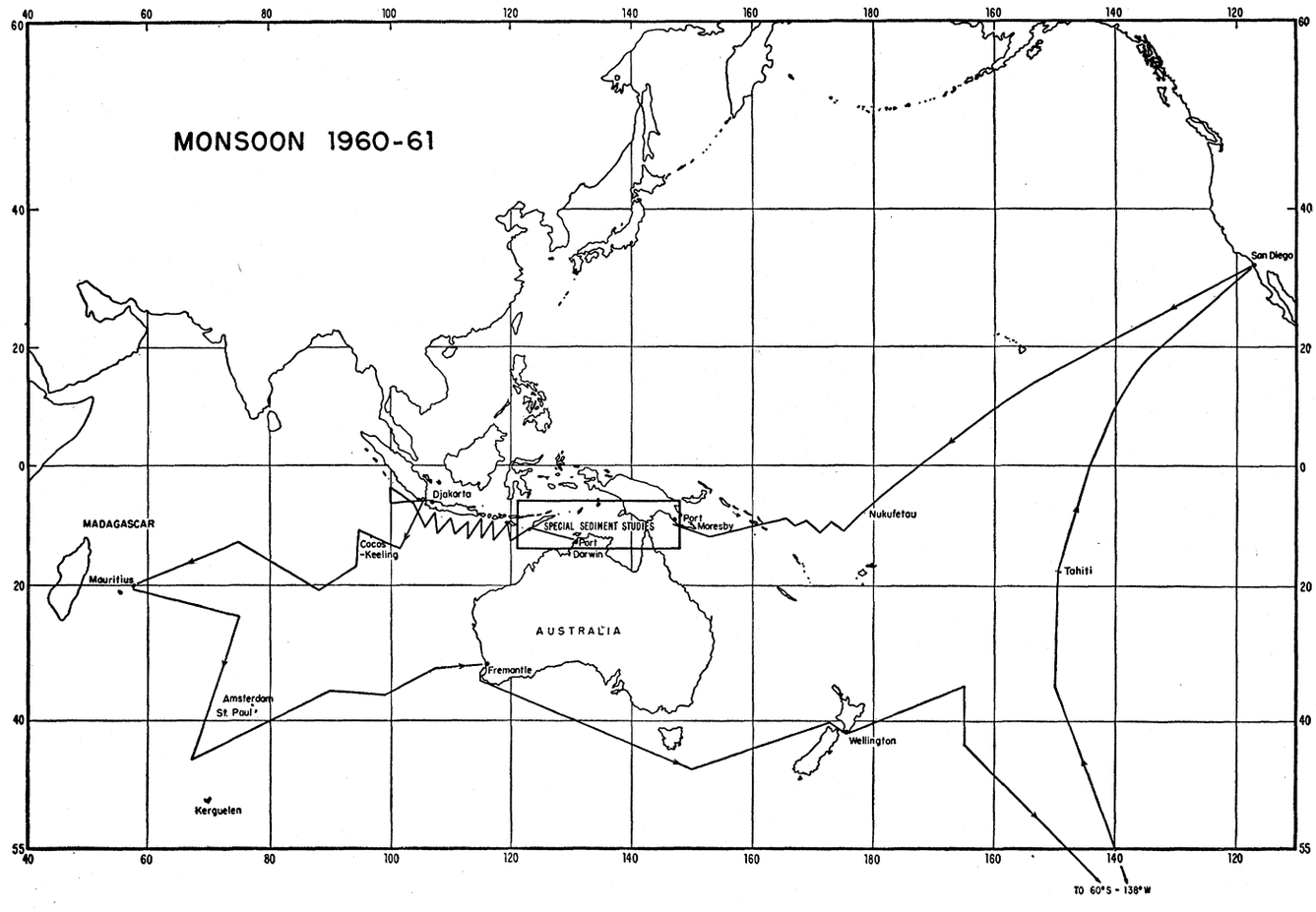
Although the biological and hydrographic data to be collected will have a direct bearing on a number of studies now in progress, the primary biological objective of the expedition is to investigate the distribution and ecology of meso- and bathypelagic organisms. The distribution of epipelagic organisms is a reflection of the circulation patterns, and consequently several of these organisms have proved to be useful as indicators. There is good reason to believe that living forms at greater depths are adapted to a particular spectrum of physical conditions and that their occurrence is limited by these conditions. By extending knowledge of the distribution and abundance of these forms, it may be possible to find correlations with the properties of the deep water and the circulation pattern.

Monsoon Expedition

Another Scripps expedition is scheduled for the period August 1960 to February 1961, when a research vessel will sail to the southwestern Pacific and southern Indian Ocean. The expedition, called Monsoon, will have a scientific program similar to those of the 1952–53 Capricorn and the 1957–58 Downwind investigations of the south and southeast Pacific, respectively.

The ship's program will include the following types of study in a portion of the southwest Pacific, part of the East Indian Archipelago, and the south equatorial and temperate regions of the Indian Ocean: bathymetric, sonoprobe seismic-refraction, magnetic, heat-flow, bottom-sampling, bottom-photography, hydrographic, and gravity reconnaissance studies. Measurements of CO_2 in the atmosphere and near-surface water will be made throughout the cruise.

Large-volume water sampling and radio-isotope and trace-element studies



will be carried out, especially during the equatorial and southwestern Pacific portions of the trip. The biological program will consist of plankton sampling throughout the cruise and of mid-water trawls and dredging for benthic organisms in the southwest Pacific and the Indian Ocean.

An earlier announcement of Monsoon's program and track, released in April 1959, indicated that a large portion of the cruise would be in the northwest Pacific and that no investigations would be carried out in the southwest Pacific. Monsoon Expedition, as now planned, includes much more extensive explorations in the Indian Ocean than had been formerly suggested. The northwest Pacific investigations proposed earlier will be carried out at a later date, possibly in the spring and summer of 1961.

Monsoon's investigations of the southern and central Indian Ocean will provide reconnaissance of part of the basin prior to the large-scale, multination cooperative International Indian Ocean Expedition of 1960–64, proposed by SCOR. Monsoon will be Scripps Institution's initial contribution to that joint effort.

The program outlined here covers the 6-month period that provides the best chance for good weather throughout the cruise. Observations will be carried out along a track of more than 35,000 miles.

Monsoon will employ the newly converted research vessel *ARS-27*, using her auxiliary boat for seismic-refraction shooting, detailed sounding on stations, and exploration of shoal areas. Perhaps the *ARS-27* will work in company with a research vessel of another nation in the Indonesia-Australia region. The *ARS-27* will accommodate a scientific party of 23 to 25.

About 18 marine scientists, chiefly from Scripps Institution, will be needed to carry out the basic program. Thus there will be room, and facilities, for several visiting scientists from other countries or laboratories.

A tentative schematic track is shown in the figure. Suggestions for participation in the expedition are invited, and provision will be made for such participation in so far as time and ship's capacity permit.

Robert L. Fisher is coordinating the over-all Monsoon scientific program and will supervise the Indian Ocean investigations. George Shor, T. H. van Andel, and Henry W. Menard will head the San Diego-Port Moresby, the Arafura Shelf, and the Wellington-San Diego segments of Monsoon, respectively.

X-Ray Picture of the Sun Taken from a Rocket

Most x-ray radiation reaching the earth is absorbed in the upper atmosphere, where it creates the belts of ionized air that make long-range radio transmission possible. The picture on this page, therefore, had to be taken from a rocket fired 130 miles into the outer reaches of the atmosphere. It shows the sun as our eyes would see it if they responded to x-rays rather than the longer wavelength radiation we call light.

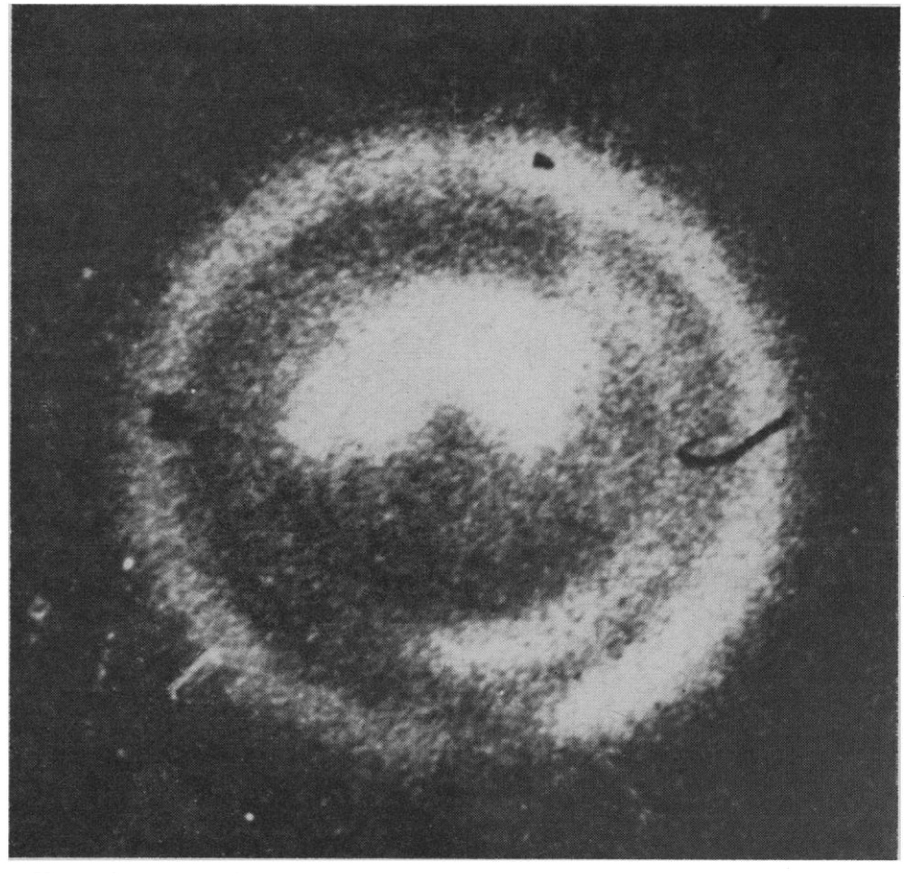
A glass lens cannot be used to focus x-rays (the rays will simply pass through the glass unrefracted); the scientists, therefore, had recourse to the primitive pinhole camera, which has no lens at all. The camera works because only a single beam of light from each point on the object can pass through the hole, so forming a point-to-point relationship between the object and an image that is formed on a screen behind the pinhole.

In this case the hole was 0.005 inches wide, and an extremely thin aluminum film was used to screen out visible light, which would have blackened the film.

The picture shows that the principal source of x-rays reaching the earth is the low-density corona surrounding the mass of the sun. Immensely larger quantities of this radiation are produced within the sun proper. But most of these x-rays, except in the case of storms such as the one appearing near the center of the photo, are re-absorbed within the sun itself and not radiated into space.

The peculiar J-shaped marking and the small blotch at the top of the corona have been subjected to the scrutiny of scientists, who have decided that they are imperfections on the film.

The project was carried out under the direction of Herbert Friedman of the Naval Research Laboratory.



X-ray photograph of the sun, taken from a rocket fired 130 miles above the earth.