

Earth and Environment Notes

OCEANOGRAPHY

Radioisotope Gauges Sediments

The need to extract cores from the ocean bottom to determine the density of sea floor sediments has been largely eliminated by development of an automatic radioisotope density gauge.

Emplacement of instruments or manned laboratories, such as the Navy's Sealabs, on the bottom depends on knowledge of the density of the underlying sediments.

The automatic gauge, developed by the Atomic Energy Commission's Oak Ridge National Laboratory, can test 60 sites in eight hours of continuous operation. Older techniques such as core sampling could test only about five sites a day.

A cesium 137 source of gamma radiation is at the heart of the device, a 25-foot-long, six-inch-diameter tube weighing 700 pounds.

When dropped to the bottom, the tube penetrates the sediments. Radiation scattered back from the sediment is automatically converted into a density reading which is recorded by a camera for later analysis.

ICHTHYOLOGY

Fish Live on Little Oxygen

Fish that live in water containing less than half the usual amount of oxygen have been found in Lake Tanganyika by a Zambian ichthyologist.

G. W. Coulter of the Department of Game and Fisheries caught eight species of fish in gill nets in water with "nil oxygen" content at a depth of 120 meters.

Laboratory studies have shown that some fish can get along in water with less than one part per million of dissolved oxygen, he notes in a report in the July 15 NATURE. Field observations, however, indicate that fish do not normally survive at concentrations below 2.9 ppm.

Some of the fish he caught were apparently swimming vigorously in water with as little as 0.6 ppm. When the oxygen dropped to 0.17 ppm, however, the gill nets came up empty.

GEOMAGNETISM

Magnetic Boundaries of the Atlantic

Magnetic boundaries parallel both the east and west shores of the North Atlantic Ocean, lending support to the concepts of continental drift and ocean floor spreading.

The boundaries apparently represent the transition, about 200 million years ago, from a steady magnetic field of long duration within the earth to a regularly reversing field such as now exists.

They are apparent in a plot of data from geomagnetic surveys made from oceanographic research ships running perpendicular to the coastlines of North America, Europe and Africa.

A magnetic boundary was first observed about 500 miles off the U.S. coast in 1961. Discovery of a similar boundary in the east North Atlantic is reported in the July 14 SCIENCE by two Columbia University geologists.

Dr. James R. Heirtzler, head of the magnetics department at the Lamont Geological Observatory, and Dr.

Dennis E. Hayes, a research associate there, note that the boundary apparently extends farther north and south in the east than in the west Atlantic.

The boundaries' relation to the earth's magnetic field over 300 million years is based on the theory that rocks in the sea floor are permanently magnetized as they are formed beneath the mid-Atlantic Ridge.

As the floor spreads, the magnetized rocks move away from the Ridge where other rocks are being formed. Thus, rocks farthest from the Ridge are the oldest; they reflect the earth's field as it was when they were formed.

ARCHAEOLOGY

Early Man in Australia

Men have lived in Australia for 31,000 years, according to results of an archaeological dig in an outer suburb of Melbourne. The earliest previous date suggested for human occupation of the continent was 25,000 years ago.

Man-made stone implements and bones of giant marsupial lions, giant kangaroos, giant wombats and the Tasmanian tiger have been recovered in excavations in Keilor, according to the Archaeological Society of Victoria. The kangaroo stood 10 feet tall and the giant wombat was as big as an elephant.

Archaeologists have been working on the site since a human skull was found there in the 1940s. Identification and radiocarbon dating of the finds were done by the National Museum and the Canberra Institute of Aboriginal Studies.

BIOPHYSICS

Tracing Canadian Blackflies

Life could be lovelier in Canada's bush country and northern woods if the viciously stinging blackfly weren't there. Canadian scientists are using radioactive phosphorous 32 to trace the perigrinations and life cycle of the flies. They hope this knowledge will help them eradicate the pest.

Scientists from Queen's University of Kingston, and the Chalk River Nuclear Laboratories expose blackfly larvae and pupae to the radioactive tracer, then return them to their river environment. The hatched flies are lured to traps of lard pails distributed in an area up to seven miles from the hatching point.

This is the second year of the research program. Last year an estimated 5 million insects were tagged.

BIOLOGY

Roundworms Attack Indian Crops

Roundworms—Nematoda—are devastating crops of potatoes, wheat and tea in food-short India, according to Dr. Bernard Weischer of the German Federal Agricultural and Biological Institute in Munster.

Dr. Weischer surveyed the crop damage and recommended control measures on assignment from the United Nation's Food and Agriculture Organization.

Up to 50 percent of the wheat plants in north Indian fields were attacked by the nematode *Anguina tritici*, Dr. Weischer reported to FAO in Rome.