

OCEANOGRAPHY

Exploring the Indian Ocean

A spirit of international scientific cooperation is present as scientists from more than 20 countries prepare for an assault on the Indian Ocean, Vincent Marteka reports.

► THE RUSH for exploring the Indian Ocean is on.

With aims as high but scope not as large as the International Geophysical Year (IGY), scientists from more than 20 countries are now banding together to explore the Indian Ocean. The survey is expected to extend man's knowledge of one of the earth's last unexplored areas and to possibly discover new sources of food for the hungry population living in its bordering countries.

Very little is known about the Indian Ocean, which covers 28,000,000 square miles or 14% of the earth's surface.

If all its waters were drained, huge uncharted areas of the exposed bottom would stretch as far as the eye could see. Only general features obtained from the few soundings of earlier surveys would be known. These would include deep trenches, high "mountains" and a prominent ridge cutting the ocean bottom in half.

The ocean water is reportedly highly fertile with sea food, yet the ocean is surrounded by many underdeveloped and underfed nations holding more than a quarter of the world's population.

The need for a systematic study was evident, and in 1958 a world-wide scientific body, the International Council of Scientific Unions, decided to plan an International Indian Ocean Expedition. True to the spirit of international cooperation, the expedition would be supervised by the Union's Special Committee on Oceanic Research and sponsored by the United Nations' Educational, Scientific, and Cultural Organization (UNESCO).

More than 20 countries and as many as 40 ships are scheduled to comb the Indian Ocean, plumbing its depths, tracing its circulation and sampling its sea life. Scientists from countries without oceanographic ships, especially those bordering the Indian Ocean, will work on vessels of such leading maritime countries as the United States, Russia and Japan.

Peak activity will be next year and 1963, with expeditions continuing through 1964.

Already scientists are preparing their "hardware" and ironing out final problems before next year's big push. An international meteorological center for collecting expedition weather data has just been set up in Bombay, India. A biological center is planned for Cochin, a small coastal town at the southern tip of India.

The ships' courses form a spidery network across the huge ocean. Oceanographic ships will sail out of ports in Australia, Africa, India and the East Indies. Some will make a wide circle touching all the bordering continents. Others will make a box-like net-

work by cruising along latitude and longitudinal lines.

The ships will log more than 188,000 miles, or about eight trips around the world.

The systematic survey, the first of its kind on the high seas, encompasses the ocean's waters, its sea life, the ocean bottom and the air above it. All these seemingly unrelated elements are in reality strongly dependent upon each other.

For example, meteorologists will send aloft balloons carrying sensitive instruments to measure the monsoon winds that sweep back and forth across the ocean. Oceanographers will trace by carbon-14 measurements the ocean currents strongly influenced in a largely unknown way by these same winds.

Biologists with gapping nets will sample the sea life attracted to the agitated food-carrying currents, and other scientists will study the ocean bottom where many of the currents originated.

The apparent productivity of the ocean was startlingly illustrated a few years ago

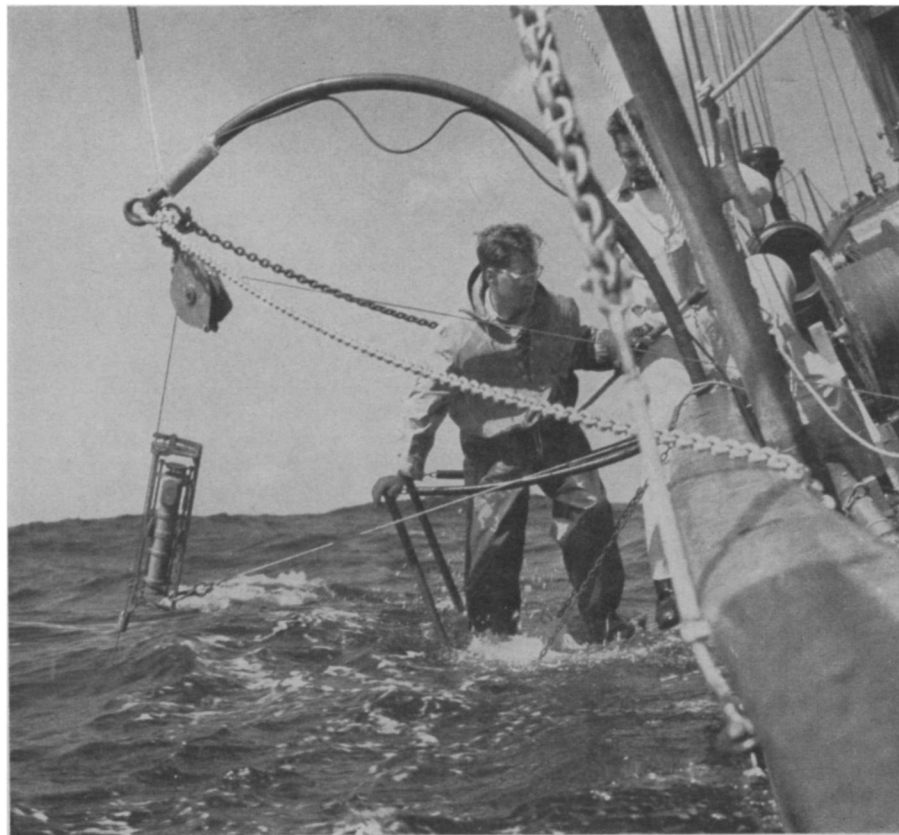
when a Russian ship reportedly saw millions of tons of dead fish floating in an area larger than the State of Missouri. The cause of the fish kill is still unknown, but the possible food source suggested is impressive.

The United States is expected to play a large role in the expedition, supplying about 10 ships and spending about \$150,000,000 for the program. An especially-equipped biological ship filled with U. S. and foreign scientists will make a systematic survey of life in the ocean, while ships from key U. S. oceanographic institutions are scheduled to study the ocean bottom and the changing circulation.

The unique biological ship will try exploratory fishing in selected regions and concentrate on waters where intense upwelling brings up nutrients for fish from the bottom.

In a series of cruises, scientists of Scripps Institution of Oceanography, Lamont Geological Observatory and the Woods Hole Oceanographic Institution will study deep trenches near Africa, basins and ridges between India and Australia, and the mid-Indian Ocean ridge, a source of frequent earthquakes.

Woods Hole ships are expected to concentrate in the Arabian Sea area, and



OCEAN SAMPLING—United States scientist lowers Nansen "bottle" into choppy ocean to sample deep-sea temperature and salinity. Thousands of these samplings will be taken in the Indian Ocean starting next year.

Scripps scientists will also study the equatorial circulation influenced by the changing monsoon conditions.

The seasonal changes in sea level in the Arabian Sea and Bay of Bengal will be simultaneously monitored by 28 tide stations.

The Nimbus weather satellite, which will be orbiting over the ocean during the expedition, will photograph cloud cover and cyclone development. Below, an unmanned weather buoy will be silently collecting weather data.

The benefits reaped from the expedition will both add to the fund of scientific knowledge and also have a direct bearing on the people bordering the ocean. In many of these countries people are suffering from malnutrition caused by protein deficiencies and aggravated by an expanding population.

These countries will be able to expand

their fisheries if new fishing areas are discovered.

Better understanding of the ocean's "heat engine" that drives the circulation of air above the surface may lead to better long-range forecasting of the monsoons. One step was taken in the right direction when the United States decided to give the expedition's weather buoy to the Indian Government after the expedition is over.

The weather buoy will act as a sentinel for storm development over the ocean.

And finally the scientists of the bordering countries will receive unparalleled training in the oceanographic sciences by working side by side with the world's top oceanographers during the expedition. The Asian and African scientists will go on the cruises performing various oceanographic tasks.

• Science News Letter, 80:274 October 21, 1961

GENERAL SCIENCE

News From Science Clubs

► **HIGHLIGHTS** from a few of the reports recently received by Science Clubs of America from its affiliated clubs:

THE PACELLI "Science for Peace" Club at Regina Coeli High School, Chiengmai, Thailand, has filled 16 showcases with its butterfly collection. Thailand has a great variety of butterflies and moths. The club has sent 60 specimens of one of the largest and most beautiful, the Atlas Atticus, to schools in Austria, France and America.

THE F.V.L. Science Club of Fox Valley Lutheran High School, Appleton, Wis., reports in its publication, "Distillations," that club-sponsored projects have included an annual science fair, a school museum, a Science Talent Search and guidance program, a science reference library, a science teachers' workshop, and the installation of an eight-inch reflector telescope at the school's Fuhrmann-Elias observatory. Fox Valley Lutheran was one of eight high schools in the nation to receive a National Science Foundation grant for a research project.

THE JUNIOR ASTRONOMY CLUB, headquartered at New York University and comprised principally of junior high schoolers, publishes a paper for the Northeast Region of the Astronomical League. The club has participated in programs involving the International Geophysical Year, Operation Moonwatch, the American Association of Variable Star Observers and the American Meteor Society.

THE SCIENTISTS of Tomorrow at George Peabody College, Nashville, Tenn., is an interschool club made up of members from Nashville's 15 high schools. Students from one or more of the schools present programs at the club's monthly meetings.

THE HOUSTON County High School Science Club at Erin, Tenn., is taking part in the community Civil Defense program.

THE PETIMUS Club at Central High School, Detroit, Mich., just organized this year, conducts scientific demonstrations and meets with other clubs.

IN ITS publication, the Experimenter, the Onaway, Mich., High School Science Club urges its members "to take all the mathematics and science possible," and recommends special programs to encourage scientific interests among sixth, seventh and eighth graders.

NEW CO-PROJECTS that clubs, classes and groups can undertake in cooperation with leading scientific organizations are outlined in the new 1961-62 Sponsor Handbook Supplement, now being mailed to club sponsors. Clubs not yet affiliated can do so, at no cost, simply by writing to Science Clubs of America, 1719 N Street, N.W., Washington 6, D.C.

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GENERAL SCIENCE

Survival Food Samples Available in New Kit

► **SAMPLES** of foods that might be useful in the event of a nuclear attack or other national disasters are spotlighted in a new, low-priced science kit now available.

The Survival Food unit of THINGS of science, just issued by SCIENCE SERVICE, is particularly timely because of widespread renewed interest in civil defense and emergency planning.

Included in the kit are three unusual foods—a multi-purpose food made from soybeans, a survival ration cracker and bulgur wheat. A vitamin C tablet as a food supplement and an iodine tablet to purify water complete the set.

Directions for performing 18 educational experiments, including testing and preparation of the food samples, are enclosed.

The kit (No. 250) can be ordered from THINGS of science, SCIENCE SERVICE, 1719 N Street, N.W., Washington 6, D. C. The price is 75 cents each, or three units for \$2.00. Membership in THINGS of science brings 12 different units, one each month, for only \$5.00.

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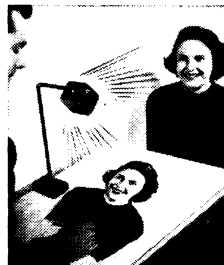
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