

# earth sciences

## METEOROLOGY

### Acoustic sounding of the atmosphere

A meteorological experiment in southeastern Colorado, using sound waves, has produced information about the lower atmosphere and indications that weather scientists may soon have a powerful new ground-based research tool at their disposal.

The experiment was conducted to evaluate an acoustic sounding technique developed by Australian scientists. In this technique sound waves of various frequencies are broadcast into the atmosphere. Studies in Australia had shown that the sound pulses are scattered back from areas of turbulence and temperature differences. The altitude probed can be adjusted by varying the frequency and intensity of the sound waves.

In September and October an international group led by the U.S. Environmental Science Services Administration set up the acoustic equipment and other devices near a 500-foot instrumented tower at a site 130 miles southeast of Denver.

The five-week project revealed a high correlation between the measurements taken by the acoustic sounders and those taken from the tower.

In addition, it showed many small stable layers in the atmosphere that seem to be constantly forming, particularly at night. They are about a half-mile to two miles long, and some descend as close to the ground as 100 feet.

## OCEANOGRAPHY

### A permanent island laboratory

A 15-year dream of scientists at the Scripps Institution of Oceanography—a major research facility built half underwater a half-mile out in the ocean—has moved a step closer to reality. The island-undersea laboratory would be connected to Scripps headquarters on the shore at La Jolla, Calif., by a 2,400-foot bridge.

Regents of the University of California have approved the concept of the project and given a go-ahead to seek funds. Based on current construction costs the facility would cost \$18.6 million and take more than three years to build.

The horseshoe-shaped unit is to rest on tubular legs anchored in bedrock beneath 80 feet of water next to the edge of the Scripps Submarine Canyon. It will have both surface and undersea laboratories, provisions for entry of divers and instruments into the sea below the wave zone and undersea observation tubes for research. The complex is to be able to handle research submarines, tethered vehicles, diving bells, habitats, decompression chambers, cages for marine animals and instrument cables to remote locations.

## OCEANOGRAPHY

### Largest ocean buoy array

Soviet oceanographers plan to set out in February the largest array of research buoys ever moored in the ocean.

Seventeen buoys will be placed in the Atlantic Ocean in an L-shaped array about 1,000 miles north of the

equator near the Canary Islands. They will be equipped with instruments to measure ocean currents at 11 levels from 10 meters to 3,000 meters below the surface.

The plans were reported by Prof. Andrey S. Monin, director of the Institute of Oceanology of the Soviet Academy of Sciences.

One purpose of the six-month experiment is to learn how to space the buoys over the ocean surface in the best way for obtaining needed scientific information. For that reason they will be positioned at irregular intervals. They will be serviced by three vessels.

Eventually such networks of ocean buoys will be used in a worldwide system to provide predictions on changing ocean conditions for such users as fisheries and shipping. It is to be known as the Integrated Global Ocean Station System.

## PETROLEUM GEOLOGY

### Oil in the Arctic Ocean

A new area of potential petroleum reserves has been found off the northwest coast of Alaska.

A preliminary survey of the Chukchi Sea in the Arctic Ocean indicates that geologic conditions beneath large areas of the sea appear to warrant further study and exploration for oil and gas. The survey was carried out in late August and early September by the U.S. Geological Survey in cooperation with the Coast Guard.

The large, shallow Chukchi Sea is of particular interest because it laps against the North Slope, site of the recent mammoth Alaskan oil strike (SN: 9/27, p. 265).

The areas of principal resource potential, according to survey scientist Dr. Arthur Grantz, are on either side of a belt of relatively old rocks, the seaward extension of the marine and nonmarine sedimentary rocks of the North Slope. "Because of the broad extent of the rocks, their geologic structure and considerable thickness," the study concludes, "they appear to be a significant target for additional exploration."

## PALEONTOLOGY

### Australian fossil find

Extensive discoveries of fish, amphibian and reptile fossils 200 million to 250 million years old have been found in Central Queensland, Australia, by a party of scientists from the Australian Museum in Sydney. The fossils include those of the earliest land animals found so far in Australia.

The team was led by the curator of fossils, Dr. Alex Ritchie. The director of the Queensland Museum, Dr. Alan Bartholomai, joined the party for the first two weeks, while it visited a site where it found more than 1,000 bone fragments and some almost complete skeletons in rock deposits more than 210 million years old.

Reptile remains being studied by Dr. Bartholomai are the oldest land animals found in Australia. They include several partly complete skulls of small animals that could be ancestors of lizards.

Another scientist is studying fossils of the salamander-like labyrinthodont amphibians. Similar fossils were found two years ago and again last month in Antarctica (SN: 12/13, p. 549).