

Earth and Environment Notes

SEISMOLOGY

Earthquakes, Sun and Moon Related

A correlation between the positions of the sun and moon and aftershocks of the 1966 Truckee, Calif., earthquake has been found by University of Nevada seismologists.

Dr. Alan Ryall, director of the university's Mackay Seismological Laboratory, points out that the correlation only applies to the weak aftershocks—microquakes—which were studied, and not necessarily to larger earthquakes.

Mackay seismologists recorded more than 14,000 microquakes in a three-week period. Their magnitudes ranged from minus one to plus one on the Richter scale.

A statistically significant correlation was found between the microquakes and positions of the sun and moon which, presumably, set up quake-producing stresses in the earth's crust by gravitational attraction.

POLLUTION

Naturally Smokeless Incinerators

By controlling the direction of airflow in an experimental incinerator, Bureau of Mines engineers have virtually eliminated noxious waste gases and achieved nearly complete destruction of wastes.

The experimental incinerators use a technique known as tangential overfiring in which the incoming air swirls down the sides of a cylindrical combustion chamber. This produced a spiral pattern in both incoming and outgoing air flows.

The pattern improves incinerator performance in two ways, according to the Bureau's Pittsburgh Coal Research Center. Incoming air is preheated, promoting thermal efficiency, and particles in the exhaust have more time to burn as they spiral up the center of the combustion chamber.

OCEANOGRAPHY

'Phone Booth' Aids Divers

An underwater telephone booth, devised by two archaeologists at the University of Pennsylvania, will be used to communicate with divers looking for a sunken Roman ship in the Mediterranean.

The booth is a clear plastic dome, four feet in diameter and about 37 inches high. Open at the bottom, it will be filled with air and mounted 130 feet down.

Archaeologist-divers will be able to get their heads out of water inside and talk with the surface through a telephone. An air hose to the surface will keep the booth's atmosphere fresh.

ICHTHYOLOGY

Fish School Structure

One of the reasons fish schools behave as they do may be that individuals are sensitive to oxygen levels in the water.

A study of striped mullet, described in the April 14 SCIENCE, shows a correlation between oxygen gradients

within a school of the fish and drastic modifications in the structure of the school.

Most of the mullet were concentrated at the rear of the school which was swimming upstream, according to William N. McFarland of Cornell University and Sanford A. Moss of Yale University.

These fish, which were breathing water already reduced in oxygen by fish at the head of the school, occasionally broke away in large groups, sometimes forming new schools, the authors note.

GEOLOGY

Florida Beaches Washing Away

Fifteen million to 20 million cubic yards of sand disappear permanently each year from Florida beaches, according to the director of the state's Division of Beaches and Shores.

Beaches at Miami have all but vanished except at low tide, apparently due to lack of replenishment from normal sources in Georgia and the Carolinas. Soil conservation projects on rivers there have reduced the usual amount of sediments that would have been carried down the coast to replenish Florida beaches. Meanwhile, Florida sand washes south to sea.

Dredging and filling in shallow waters near the coast have depleted shellfish life there which also once contributed to beach formation.

The problem was aired at a recent symposium at the University of South Florida in Tampa.

GEOLOGY

Oil Shale Electrically Fractured

High-voltage electricity used to break up deposits of oil shale in the ground may prove to be the key to exploitation of this bountiful resource.

If the shale deposits can be fractured sufficiently, it may be possible to distill the oil without having to mine the shale. Passages created by fracturing would let in air to support combustion and let the oil vapor out.

Success in using electricity to fracture oil shale deposits has been reported by the Bureau of Mines Petroleum Research Center, Laramie, Wyo.

In experiments in mine tunnels and shallow wells, Bureau scientists used high-voltage, low-amperage electricity. Detonation of a small charge of nitroglycerin following the fracturing aided air flow between test wells, they report.

WATER RESOURCES

Canadian Water Lab Established

Water pollution in the Great Lakes will be the major research subject for a new national inland water research center in Burlington, Ontario, near the shores of Lake Ontario.

The \$5.7 million center being set up by the Canadian government will draw on the faculties and facilities of nine universities and colleges located within 50 miles of the site.

Initial work at the laboratory is being carried on in temporary trailer facilities while permanent buildings are constructed.