

## GEOPHYSICS

# Earth Drill Proposed

► AN "ATOMIC DRILL" that melts its way into the earth's interior was proposed at the American Geophysical Union meeting in Washington, D. C.

A needle-like drill housing a high-temperature nuclear reactor core would actually melt through the rock layers it passes, Dr. W. Mansfield Adams of the University of California's Lawrence Radiation Laboratory, in Livermore, said. The drill would be used to study the deeper layers of the earth's crust and the dense mantle surrounding the core of the earth.

The searing-hot, 2,000 degrees Fahrenheit core would alternately melt the rock and then fall through the resulting molten material, Dr. Adams said.

Ceramic "bottles" were proposed for collecting molten rock samples at various depths. The "bottles" are plugged by rods that wear away at different rates, thereby collecting the samples periodically as the core melts its way down through the crust.

Later the core would release some weights and the drill would float back to the surface.

The project seems quite feasible, Dr. Adams said, but no estimate of the cost is available. The United States is already working on another drill that will penetrate the earth's crust, but it is mostly a refined method of present conventional drilling.

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## Ocean Circulation

► VERTICAL circulation of ocean waters near the ocean surface is helping to feed the fishes of the sea.

U. S. Navy scientists have measured distinct sinking and upwelling of water masses near the surface for the first time, Dr. Eugene C. LaFond of the Navy's Electronics Laboratory in San Diego, Calif., reported. The currents could continually bring up food from the depths for the surface marine life and also take down the surface food, such as plankton, for the larger fish in the deeper depths.

The currents are formed by relatively large waves that are found where cold deeper layers meet the warmer surface layers. These "internal waves" create vertical currents as they roll along, Dr. LaFond told the American Geophysical Union meeting in Washington, D. C.

Knowledge of these currents is very desirable for underwater missile launching, submarine movement and the distribution of food for marine life, Dr. LaFond said. Television and movie cameras were used to spot the currents. The equipment was housed in a car suspended from a tower, one mile off the California coast.

Similar investigations in the Atlantic Ocean, Indian Ocean and the Gulf of Mexico strongly indicate that the vertical current movement is world-wide, Dr. LaFond stated.

The origin of the "internal waves" is still a mystery. Some scientists believe storms far out at sea start the waves, others think they are due to cold and warm layers meeting.

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## Dust Layer Around Earth

► A DENSE LAYER of cosmic dust is orbiting around the earth, Dr. S. F. Singer, a University of Maryland physicist, said.

The dust layer reaches a peak concentration about 600 miles above the earth's surface, Dr. Singer suggested at the American Geophysical Union meeting in Washington, D. C.

Cosmic dust floating near the earth is pulled toward the earth by its gravity. The dust particles go into orbit when the pull of gravity balances the tendency of the dust particles to escape from the earth's influence.

The density of the layer probably becomes greater than that of the earth's atmosphere about 1,800 miles out in space, Dr. Singer said. It could become as much as 60 times denser than the earth's covering of air.

Although most particles are influenced primarily by the earth's pull of gravity, the smaller particles are also affected by the earth's magnetic field and the sun's radiation, the scientist said.

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## ASTRONOMY

## Metallic "Meteorites" Found in Tektites

► TINY "meteorites" found in tektites strongly indicate the material came from outer space.

Tiny metallic spheres or meteoric material were discovered for the first time in a tektite from the Philippines, Dr. E. C. T. Chao of the U. S. Geological Survey reported. Tektite is a natural glass of unknown origin.

Dr. Chao strongly believes the tektite came from the moon. The glass was probably formed when a meteorite smashing into the moon sent a spray of small liquid particles that cooled into a glass.

The silvery metallic spheres contained approximately the same amount of nickel and iron as found in a meteorite, Dr. Chao said. Other properties of the glass rule out the possibility that it formed on the earth. Some scientists believe tektites result from comets or meteorites striking the earth.

"The discovery of the metallic spheres provides the strongest evidence thus far that tektites came from outer space," Dr. Chao said. More research, currently taking place in the U. S. Geological Survey laboratories, is needed before it is definitely proved. The tektite he studied was 500,000 to 600,000 years old.

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## Source of Auroras

► THE BRIGHT "northern lights," or auroras, are caused by electrically charged particles leaking into the atmosphere from the Van Allen radiation belts.

Extra electrons and protons are created in the earth's magnetic field when there is an eruption on the sun, Dr. John W. Kern of Rand Corporation, Santa Monica, Calif., told the American Geophysical Union meeting in Washington. The charged particles are dumped into the earth's atmosphere, creating a display that lights up the northern sky.

A solar flare on the sun sends a steady flow of ions hurtling toward the earth that distorts the magnetic field. Electrons and protons in the magnetic field separate and drift away from each other, creating charged particles. The particles then take turns drifting toward the outer Van Allen radiation belt where they are finally dropped into the earth's atmosphere near the North Pole.

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## ROCKETS AND MISSILES

## Missiles in Future Could Fight Fires

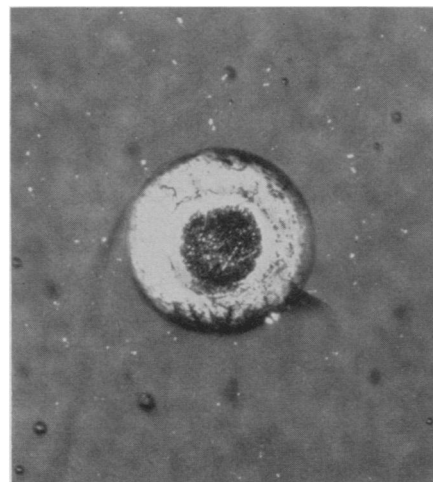
► MISSILES could help fight forest fires of the future.

This is the idea of Dr. George M. Jemison, deputy assistant chief of research for the U. S. Forest Service. Missiles on pads, placed in strategic locations throughout forest areas, might be used to control fires until ground crews could arrive on the scene.

Missiles would be filled with fire-retardant chemicals and would be guided to the fire by heat-sensing nose cones. They would be detonated with proximity fuses at predetermined heights above the fire.

The size of the fire would determine the number of such missiles to be launched simultaneously. Meanwhile, ground crews would be going to the fire area by helicopters and landing at heliports scattered throughout the forest.

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"METEORITE" IN TEKTITE