

# Earth and Environment Notes

## GEOLOGY

### **Bacteria Refine Copper Wastes**

Ore piles containing at most two-tenths of a percent of copper are being refined to useful copper sulphate ore in Australia by bacteria called autotrophs.

Last year, the bacteria produced 500 tons of copper, according to J. E. Anderson, a chemical engineer with Con-Zinc of Australia Ltd.

He says the bacteria live by processing inorganic materials, much like plants. At the CRA plant in Rum Jungle, Northern Territory, the autotrophs are employed in a two-stage system of processing ore wastes, which produces copper sulphates from low-grade copper sulphides in the wastes.

## PALEONTOLOGY

### **Peccary Fossils Found in Kentucky**

Fossil bones of four peccaries, pig-like animals, were unearthed by a bulldozer operator near Hickman, Fulton County, Ky.

The bones, estimated to be between 25,000 and 40,000 years old, are now being studied by Dr. Frank C. Whitmore, a U.S. Geological Survey specialist in vertebrate paleontology at the Smithsonian Institution.

The peccary fossils were found in a layer of loess—wind-blown silt—that may have come from mud flats along the ancient Ohio and Mississippi River valleys.

Radiocarbon dating of the fossils will provide dating of their accompanying layers of loess, according to the Survey.

## METEOROLOGY

### **Storms Within Storms**

When it rains, it pours some of the time and drizzles some of the time and the areas where it is pouring or drizzling seem to walk around within the storm.

Those are some of the conclusions Bell Telephone Laboratories researchers have drawn from data collected by an unusual 50-square mile array of 100 electronic rain gauges.

The gauges, which look like garbage cans with funnels sticking out of them, were mounted on phone poles around Bell's Crawford Hill Laboratory, Holmdel, N.J. They were set up originally to get accurate, detailed information on the nature of rainfall which interferes with microwave communications in the 10 to 100 gigacycle frequency range now being investigated by Bell electronics engineers.

The gauges are linked to a computer which samples the data from each gauge every 10 seconds during a storm and produces maps showing the distribution of rain within the area.

A report on the system was prepared by Ralph A. Semplak, a member of the Atmospheric Physics Research Department at the laboratory.

## VOLCANOLOGY

### **Mt. Rainier Could Erupt Again**

Mt. Rainier, whose snow-covered summit dominates western Washington, may be only dormant and not dead as a volcano, according to a U.S. Geological Survey study.

Even a mild re-awakening of volcanic activity within the 14,410-foot cone could trigger huge mud and debris slides, says Dwight R. Crandell, co-author of "Volcanic Hazards at Mount Rainier, Washington," just published by the Survey.

The last such occurrence, 500 years ago, set off a mud flow that raced about 40 miles down the valley and left a 15-foot-thick layer of rock and mud in its wake.

The history of the volcano suggests that an eruption on almost any scale could happen at any time, Crandell says. The mountain has always had long periods of inactivity punctuated by brief episodes of eruption or steam venting.

## LIMNOLOGY

### **Natural Flows Keep Lake Clean**

Lake Michigan remains largely pollution free because of water currents induced by the motion of the earth, according to a University of Wisconsin limnologist.

The earth motion creates variations in wave patterns and currents in different areas of the Lake that keeps polluted waters mostly within 10 miles of the shores.

Water along the shores generally moves in north-south directions, while that in the center of the Lake swirls in huge, 50-mile-wide eddies that turn counterclockwise.

In addition, notes Clifford L. Mortimer, director of the university's Milwaukee Center for Great Lakes Studies, a thermocline 90 feet below the surface helps keep polluted water near the surface.

Mortimer described his observations at the International Symposium on Eutrophication in Madison, Wis.

## OCEANOGRAPHY

### **Sea Floor Spreading Not Continuous**

The sea floor spreading now being observed has apparently not been a continuous process through the earth's history, according to a report published in June 23 SCIENCE.

A study of sediments on the sea floor on both sides of the rift along which the floor appears to be spreading seems to show that the process is intermittent.

The present spreading began about 10 million years ago. This was after a long period of stability during which most of the observed sediments were deposited, according to the authors, Drs. Maurice and John Ewing of the Lamont Geological Observatory, Columbia University, New York.

They found that sediments near the rifts were thinnest and that thicker layers were generally found at some distance from the rift centers.