

## GEOLOGY

### Sinking of the oceanic plate

The continual creation of new ocean floor at the mid-oceanic ridges requires the destruction of older ocean floor at some other location. This is taking place at deep trenches around the edges of the ocean basins. There vast plates of the earth's surface 70 to 100 kilometers thick dip downward at a rate of about 10 centimeters a year and eventually plunge into the underlying mantle.

The forces in action as the plate heads downward are only beginning to be understood.

A comprehensive study of deep seismic activity in these regions by Dr. Bryan Isacks and Peter Molnar of the Lamont-Doherty Geological Observatory leads them to propose that down-going slabs of the plate may exert a strong pull on the portion of the plate remaining on the surface. As the slab descends deeper into the area of the mantle called the asthenosphere, it encounters increasingly stronger material and eventually hits bottom about 650 to 700 kilometers deep. This releases much of the downward pull on the surface plate.

These interpretations of their new data, say the researchers in the Sept. 13 issue of *NATURE*, suggest that the pull of the descending slabs may be an important contribution to the driving forces of earth movements on a global scale. In addition, they say that hiatuses or changes in the rates and direction of sea-floor spreading and continental drift might result when the descending slabs reach 500 to 700 kilometers.

## GEOCHEMISTRY

### Red Sea spreading

Seismic, gravity, magnetic and heatflow studies have provided an abundance of evidence that the Red Sea is an area of sea-floor spreading. Study of topography too indicates that Africa and Arabia were once joined and are gradually being moved farther apart by an ever-widening Red Sea floor.

Further evidence of this process is reported in the Sept. 27 *SCIENCE* by Dr. Jean-Guy Schilling of the University of Rhode Island. He studied the chemical characteristics of basalts raised from a trough running down the length of the Red Sea to determine whether they were similar to those basalts extruded at the mid-oceanic ridge. The pattern of abundances of rare earth elements in the Red Sea material did indeed show close similarities to basalts from the ridge.

The finding adds further to the evidence that the axial trough of the Red Sea belongs to the worldwide oceanic rift system and is part of the pattern of spreading ocean floors.

## MARINE GEOLOGY

### Age of the Bay of Biscay

Palcomagnetic studies in the last three years have shown that the Bay of Biscay, north of Spain, was probably created by a rifting due to a counterclockwise rotation of the Iberian peninsula away from the rest of Europe. But exactly how long ago this took place was not known.

A new study relating bottom samples to seismic profiles has found that the bay was fully opened at least by the Middle or Upper Miocene, 20 to 25 million years ago. A large part of it has been in existence much longer, since sometime in the late Cretaceous, 65 to 100 million years ago.

The finding conflicts with several earlier studies that implied that the bay is a much younger feature.

Drs. E. J. W. Jones and J. I. Ewing report their results in the Oct. 3 *SCIENCE*.

## GLACIOLOGY

### Dusting a glacier in Chile

The first part of an experiment in Chile to convert glaciers into water supplies by sprinkling a layer of absorbent black dust on their surfaces has produced encouraging results.

Dr. Cedomir Marangunic, a polar scientist at the University of Chile, says the work this year on the Coton Glacier in the Andes shows that water can be produced economically in this fashion.

Surface ablation was increased up to 300 percent by the mixture of lampblack and other materials spread over the glacier from four airplanes. About 10,000 cubic meters of additional meltwater per day were produced for each square kilometer treated. Costs of applying the dust totaled \$2,900 per square kilometer.

At this rate, it took 81 days of water production to reimburse the Chilean national electric company for its expenses in supporting the project. The utility used the water to run its generators.

Dr. Marangunic plans to expand his studies on Chilean glaciers during the coming summer.

## PALEONTOLOGY

### Fossil search in Antarctica

A search for further fossil evidence that Antarctica was once joined to other continents will be conducted by scientists from three institutions during the next six months.

A 17-man group will seek fossils of ancient land vertebrates similar to those found on continents now separated from Antarctica by up to 2,000 miles of ocean. Only one vertebrate fossil, a piece of jawbone of a freshwater amphibian called *Labyrinthodontia* (SN: 3/23/68, p. 280), has been found in Antarctica. More recently, the finding of a fossil insect wing similar to that of a species once prevalent in Australia (SN: 7/12, p. 30) provided additional evidence for a prehistoric proximity of those two large land masses.

The new fossil search, to be carried out by scientists from Ohio State University, Wichita State University and the American Museum of Natural History, will concentrate on the central Transantarctic Mountains, where the *Labyrinthodontia* was found.

The effort is part of the 1969-70 U.S. Antarctic Research Program, which for the first time will include women scientists. Four women from Ohio State University and one from Utah State University will be doing research.