

## GEOLOGY

# Sea Pressure Forms Slopes

The formation of continental slopes are due to vast pressures of the ocean floor that fold and weld debris against the land, according to a new theory—By Barbara Tufty

► VAST PRESSURES of the ocean floor fold undersea debris like an accordion and weld it against the continents to form new land extensions under the sea.

This is a new explanation for the formation of the continental slopes—those abrupt, underwater slopes that plunge steeply into ocean depths several miles from shore.

The steepness and ruggedness of the sea walls are signs of youth, believes Dr. Robert S. Dietz, oceanographer of the Coast and Geodetic Survey, U.S. Department of Commerce, in Washington, D. C.

By "youth," Dr. Dietz means a relative young age, geologically speaking. Continental slopes off California and around much of the Pacific Ocean, for instance, were formed only about 150 million years ago, during the period when dinosaurs roamed the earth.

Dr. Dietz offered his new theory on sea slope formation in the *American Scientist*, March 1964.

He stated in his report that the dominating element in forming continental slopes is the enormous deposit of sediment which accumulates at the base of the slopes.

Periodically, heat forces in the ocean floor slowly move to squeeze the sediment and cement it against the continental block to

form new extensions under the sea. Continents are like great, somewhat flat, icebergs, floating buoyantly on the earth's mantle.

The mantle is a solid, slowly flowing, silica magnesium material, estimated to be about 1,800 miles thick. It covers the 2,160-mile thick core of the earth, and flows under the earth's crust, which is three to 40 miles thick.

The continents are composed of a lighter material than the mantle, and include the land mass, shelves which extend several miles into the sea and the steep slopes that drop into deep ocean. The slopes are considered the true limits of the continental blocks.

Dr. Dietz confronts the general theory that slopes are great banks of rock debris shed from the land by saying that the relatively young age of the slopes indicates more recent formation. If the slopes were old, they would be worn down just as mountain ranges are worn.

His theory also refutes other ideas that slopes may have been caused by some primeval catastrophe such as the moon being pulled out of the Pacific, or great meteorites blasting out the ocean basins.

Slopes around the Atlantic are the same age as those around the Pacific, he said,

but have a different origin. The Atlantic slopes are basically rift slopes remaining since the time when the continents of America and Europe-Africa drifted apart.

Dr. Dietz supports the theory of the continental drift by saying that continents have been carried along by a moving mantle, like icebergs being moved by the sea. The continents did not drift through the mantle, he said.

He cited a small-scale example of the drift theory with the shores of California, where one portion of the state moves about two inches per year relative to the rest of the state.

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## BIOTECHNOLOGY

## Norbert Wiener Foresaw New Type of Medicine

► A NEW MEDICINE, which treats a person's symptoms as they occur and are detected by sensing devices within the body, was foreseen by the late Dr. Norbert Wiener, the Massachusetts Institute of Technology mathematician considered the father of the age of automation.

Less than two months before his sudden death in Stockholm (March 18), Dr. Wiener predicted the trends he expected in biology and physics within the next 20 years. His forecasts, reported in the *New Scientist*, 21:211, 1964, are based on basic research just now beginning in laboratories around the world.

The technique of treating symptoms as they occur, for instance, is already being tested in diabetics by Dr. John Lyman and his associates at the University of California at Los Angeles.

The scientists are monitoring the sugar level in the blood of diabetics to see if insulin can be released according to the person's need instead of by the clock.

This new kind of constant treatment, Dr. Wiener said, represents an extension of the ideas used in the artificial pacemaker for those with heart trouble.

Dr. Wiener also predicted that living materials would, by 1984, be used as part of computers. He said the memory properties of the complex nucleic acids that carry genetic information in living cells would be used in machines that need an artificial memory.

Another forecast was that there will be a new way of looking at the physical universe. Dr. Wiener agreed with Einstein in his view that "God does not play dice with the universe."

Although probability now seems to play a part in the quantum theory that so neatly explains the reactions of atoms, Dr. Wiener believed that looking at a smaller scale of space and time would show that nuclear reactions are actually determined, and do not occur by chance.

He predicted a "much more unified physics in which both quantum theory and relativity are to be recast and in which the origin and disintegration of fundamental particles will be of the nature of quantum jumps."

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Maremont Corporation

**DUST FOR FUEL**—Milton Farber, propulsion expert and president of Maremont Corporation's Pasadena research laboratories, shows the model of a "colloid" engine that may someday provide extremely high speeds to space-ships and be fueled on the moon by low-cost substances or even "moon" dust.