AGU

Gathered at the 50th anniversary meeting of the American Geophysical Union in Washington

OCEANOGRAPHY

Rocks from the Indian Ocean

One of the newest pieces of sea floor to have been dredged up in any ocean was igneous rock recovered from the Indian Ocean about six months ago. Its composition was described by Dr. Robert L. Fisher of Scripps Institution of Oceanography, La Jolla, Calif.

Reporting analysis done with Celeste G. Engel of the U.S. Geological Survey in La Jolla, he said the fresh basalts are predominantly glassy to porphyritic. These basalts were extruded through red mud that adhered to the samples.

All of the basalts, some of which could possibly be no more than one week old, contain vesicles and tubules and occur in roiled, bulbous, folded and distorted forms. They were dredged from a ridge in the Indian Ocean bottom by the Scripps Research Vessel Argo on the Circe expedition.

OCEANOGRAPHY

Southern continents fit drift theory

A computer has been used by two scientists at ESSA's Atlantic Oceanographic Laboratories in Miami, to fit together the continents of Australia and Antarctica. The best match was found by placing the toe of Tasmania into the Ross Sea and the southwestern tip of Australia against the Knox Coast.

Dr. Robert S. Dietz, former senior scientist at the Navy Electronics Laboratory Center in San Diego, and Dr. Walter P. Sproll, presented geologic evidence supporting the often-suggested theory that the two continents were once joined. They find that similar geologic structures occur at the points where the two land masses were most likely to have been joined.

METEOROLOGY

Breaking a laboratory vortex

Experiments at Catholic University of America by Dr. C. C. Chang have shown that it is possible, at least for a very short time, to break up a simulated tornado-like vortex created in the laboratory.

The dynamic behavior of the model vortex with a single funnel is similar to a natural tornado, whose two main destructive features are high rotating winds around the core and the partial vacuum in the core which sucks up matter from the earth's surface.

Dr. Chang introduces a gas-filled balloon into the core of the simulated vortex with known circulation and updraft. At the desired height, the balloon is exploded by means of an electric spark and high-speed movie photographs taken. From the film record and other evidence, he finds the tornado-like vortex breaks up for about half a second, then gradually is restored.

Dr. Chang plans to test the laboratory simulation in the field this summer by exploding balloons in an easily available natural vortex, dust devils.

LUNAR ASTRONOMY

New mascons discovered

Six new mascons, mass concentrations of dense material, have been discovered beneath the moon's surface by scientists at the Jet Propulsion Laboratory. The mascons cause changes in the velocity of moon-circling spacecraft.

To investigate and chart these mascons, the lunar orbiting period of Apollo 10 has been lengthened from about a day to 61.5 hours (SN: 5/3, p. 430). The six new concentrations bring the number now known to 12.

Their positions were located by William J. Sjogren, Paul M. Muller and Dr. Peter Gottlieb of JPL. They are beneath the maria known as Grimaldi, Humboldtianum, Orientale, Smythii and two unnamed mare areas.

As with the first six, each mascon was found to be centered below a ringed sea or an ancient, now obliterated circular sea.

OCEANOGRAPHY

Drifting volcanoes

Volcanic seamounts in some highly surveyed ocean areas increase in size with distance from a mid-ocean ridge crest. This suggests that they remain active as they drift with the earth's crust, Dr. Henry W. Menard of Scripps Institution of Oceanography reported.

Mid-ocean ridges mark the seams in the ocean floor through which lava flows to create new sea bottom on both sides. The volcanoes are carried with this new bottom, by sea floor spreading, growing as they drift. The bigger ones have been building up for the longest time and have drifted the farthest. They are also standing on much older ocean floor than those close to the ridges.

It takes at least 10 million years for such volcanoes to reach the surface, Dr. Menard said. Guyots and atolls generally occur only on much older crust, suggesting that ocean basin volcanoes remain active for tens of millions of years.

LUNAR GEOPHYSICS

Meteor impacts on lunar surface

During periods of major meteor showers, there is a highly increased flux of dust particles near the moon, observations made from Lunar Explorer 35 satellite have shown.

During non-shower periods, particles of mass greater than 5 picograms (5 trillionths of a gram) averaged 2.5 times 10^{-4} per square meter. During major meteor showers, the flux not only increased by more than one order of magnitude but came also from the lunar direction, not in a random distribution.

Drs. W. M. Alexander and Martha A. Fenner of Baylor University in Waco, Texas, and Dr. J. Lloyd Bohn of Temple University in Philadelphia have charted these dust enhancements in space near the moon during the Orionid and Leonid meteor showers both in 1968 and 1969.