

earth sciences

GEOMAGNETISM

Magnetic reversals and the galaxy

Paleomagnetic studies have firmly established that the magnetic field of the earth periodically reverses its polarity. The intervals vary, but the existence of magnetic epochs, which show predominately one polarity for about one million years, and magnetic events, with durations of about 200,000 years, has been demonstrated.

Now three scientists studying the cycles in detail have identified two longer periods in the spectrum—of 300 million years and 80 million years respectively. These intervals, they point out, correlate closely with the calculated 280-million-year period for rotation of the Milky Way and the 84-million-year vibrational period of the sun perpendicular to the galactic plane.

This apparent correlation, they say, "may indicate an external cosmological influence on the earth's magnetic field."

More polarity measurements in the pre-Cambrian age and better knowledge of the galactic magnetic field would be needed to test the hypothesis.

The report, in the July 19 *NATURE*, is by Drs. I. K. Crain and P. L. Crain of the Australian National University and Dr. M. G. Plaut of the University of Western Ontario.

LIMNOLOGY

Great Lakes underwater habitat

The first underwater habitat to be used in the Great Lakes is now completing its first tests this week.

Seven University of Michigan scientists were performing experiments to measure animal and plant life and to study the lake-bottom geology. The habitat was anchored in 30 feet of water in Little Dunks Bay, near Tobermory, Ontario.

Named Sublimnos, meaning "under fresh water," the eight-ton habitat was designed and is owned by Dr. Joseph B. MacInnis, a medical consultant for the U.S. Navy's Man-in-the-Sea program. It is designed to stay in the bay for two years.

METEOROLOGY

Diurnal wind variations

Meteorological rocket soundings in recent years have revealed the existence of tidal motions above 30 kilometers in the earth's atmosphere that have a daily cycle. Recent developments in tidal theory by Dr. R. S. Lindzen explain most of the features as a response to absorption of solar energy by water vapor and ozone.

Detection of diurnal wind motions below 30 kilometers has been much more difficult. Amplitudes are small, and the diversity of results has been discouraging.

In a new study, two University of Washington scientists have found that in polar regions a simple pattern exists: Wind flows across the pole from the daytime hemisphere to the nighttime side at all levels.

But at low and middle latitudes, the wind difference patterns are strongly related to topography, even at stratospheric levels. Land-sea contrasts and terrain slope

appear to be the controlling influences, report Dr. J. M. Wallace and F. R. Hartranft in the *MONTHLY WEATHER REVIEW*.

MARINE GEOLOGY

Green Bay sediment probe

The University of Wisconsin plans this month to begin use of a new 27-foot-long vibrating sediment probe.

It will be used in the waters of Green Bay to obtain sediment samples as part of a continuing marine geological study begun last summer. The device's first mission is to establish the depth of manganese nodule deposits located last year (SN: 11/9, p. 476).

OCEANOGRAPHY

Arctic covered by ice for 25,000 years

The present ice coverage in the Arctic Ocean has probably remained unchanged during the last 25,000 years, a new study suggests.

The current theory of ice ages, advanced by Drs. William L. Donn and Maurice Ewing in 1966, requires that the Arctic Ocean be open during the early part of each glacial period to supply moisture for the growth of glaciers. The new study may have no direct bearing on the glacier theory, though, because it tells nothing of the period before 25,000 years ago. It does bear out the fact that the 1966 revision of the original Donn-Ewing theory—which postulated that the Arctic Ocean surface froze over about 11,000 years ago—was necessary.

In the new study, Drs. Jan van Donk and Guy Mathieu of the Lamont-Doherty Geological Observatory found that the ratio of oxygen 18 to oxygen 16 in sediment cores containing foraminifera was unchanged over the 25,000 years. Any large change in the ice cover, they say in the June 20 *JOURNAL OF GEOPHYSICAL RESEARCH*, would have affected evaporation, mixing and precipitation and thus changed the concentration of the heavy isotope.

GEOGRAPHY

The floating island sinks

A small floating island with 10 to 15 palm trees on it drifting in the waters of the Caribbean: That was the report from U.S. Navy destroyer escort John Pearce. The Pearce and the Coast Guard cutter Hamilton tracked the island visually and with radar at various times in the waters south of Cuba, from July 3 to 14. It was about 15 yards in diameter and apparently held together by a mangrove-type matting. The trees were 30 to 40 feet tall. No leaves were visible, except for dead grass-like material around the base.

The island attracted enough scientific attention that the Smithsonian Institution organized an expedition to study it. But as final preparations were being made, there came a report (July 16) that an extensive 6-hour aerial search had failed. Apparently the floating island sank.

Speculation was that it originated at the mouth of the Amazon or Orinoco Rivers.

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