earth sciences

Oldest Indian Ocean sediments

The Deep Sea Drilling Project's Glomar Challenger has discovered the oldest sediments ever found in the Indian Ocean. In the sixth in a series of two-month drilling voyages in the Indian Ocean, the research vessel recovered brown claystone sediments 530 meters beneath the ocean bottom at a point south of the Java Trench and west of northern Australia.

The sediments are from the lowermost Cretaceous or the uppermost Jurassic, which would make them about 136 million years old, "the oldest dated sediment in the Indian Ocean," according to a summary from the Scripps Institution of Oceanography.

The old sediments lay directly above ocean basement basaltic rock (the original ocean floor) and thus show that that part of the eastern Indian Ocean was formed about 136 million years ago.

Co-chief scientists on the voyage, the 27th leg of the project, were James R. Heirtzler of Woods Hole Oceanographic Institution and John J. Veevers of Macquarie University in Australia.

Revising earth's geologic timetable

Estimates of the age of the boundary between the Miocene and Pliocene epochs of the earth's history have ranged widely over the past decade from 3 million years to 13 million years. But the most firmly established figure is 12 million to 13 million. A chart put out by the U.S. Geological Survey, for instance, places the boundary at 12 million years.

Now the age may have to be moved up to a much more recent time, according to new evidence found by two scientists from the Australian National University. The large uncertainty over the age of the boundary has been due partly to problems in finding appropriate rocks to date by radioactive methods and partly to difficulties involved in making correlations with the sedimentary and fossil records.

J. B. Gill and Ian McDougall have found and managed to date some volcanic rocks from Fiji that are related stratigraphically to sediments containing marine fossils that define the Miocene-Pliocene boundary.

From their data, they infer that the Miocene-Pliocene boundary lies between 4.5 million and 5.3 million years ago. The best estimate of its age, they conclude in the Jan. 19 NATURE, is 4.9 million years ago, give or take 400,000 years.

Warmth of the Midwestern mantle

The mantle underlying the earth's crust is apparently warmer beneath the Northern Great Plains than it is beneath other parts of the Midwest. Twenty six new determinations of the amount of heat flowing upward to the earth's surface show significantly greater values at borehole sites in North and South Dakota (2.0 heat flow units) than for sites in Illinois, Indiana, Iowa and Michigan (an average of 1.4 heat flow units).

The crust is about the same thickness beneath both regions. This and other evidence lead Jim Combs of the University of California at Riverside and Gene Simmons of MIT to conclude in the JOURNAL OF GEOPHYSICAL RESEARCH (Vol. 78, No. 2) that the observations require "lateral temperature differences in the upper mantle."

medical sciences

Vitamin C and heart attacks

With all the hoopla about vitamin C as a preventer of colds, it is possible that vitamin C plays a more crucial role in helping prevent heart attacks. Emil Ginter of the Institute of Human Nutrition Research in Bratislava, Czechoslovakia, reports in the Feb. 16 SCIENCE that vitamin C helps remove cholesterol from the body. If too much cholesterol builds up it can lead to atherosclerosis (deposition of fat in the blood vessels). Atherosclerosis can lead to heart disease.

For three months, Ginter compared guinea pigs chronically deficient in vitamin C with control guinea pigs. The deficient animals had good appetites, grew and looked normal from all outward appearances. But they had more cholesterol and less vitamin C in their bloodstreams and livers than did the control animals. Their livers also metabolized cholesterol much slower than did the livers of the control animals. So it looks as if vitamin C helps enzymes in the liver turn cholesterol into bile acids, for eventual removal from the body.

If these results apply to man, Ginter concludes, a latent vitamin C deficiency might well contribute to too much cholesterol in the body, atherosclerosis and eventually heart disease.

Please don't eat the toothpaste

Inner-city children who nibble lead paint off the walls of tenement houses are often the victims of lead poisoning. In the Feb. 1 JOURNAL OF THE AMERICAN DENTAL ASSOCIATION, Irving M. Shapiro of the University of Pennsylvania reports that lead from the inside of toothpaste tubes may make these youngsters even more susceptible to lead poisoning.

Shapiro and his co-workers tested six brands of toothpaste. They sampled toothpaste from deep inside full tubes, and toothpaste from tubes that were about empty. All the samples contained lead, but especially those from near-empty tubes. They estimate that if a child brushes his teeth twice a day he could ingest up to 1,800 parts per million of lead daily just from toothpaste. Normal daily childhood intake of lead in food is 130 ppm.

How much lead must a child eat every day to become poisoned? Researchers aren't sure. Lead doesn't stay in the blood long enough to be measured but moves right into bone and accumulates there.

Food additives on the attack

Most antimicrobial food preservatives keep unwanted bacteria from growing in food, but nobody has known how they do it. In the Feb. 2 NATURE Ernst Freeze and his colleagues at the National Institute of Neurological Diseases and Stroke report that these additives help starve bacteria.

Fatty acid preservatives keep amino acids, organic acids, phosphates and other nutrients from entering bacteria cells. They apparently do so by interfering with oxidative phosphorylation and electron transport —the elegant process whereby cell factories turn nutrients into energy molecules called ATP.

Although antimicrobial food preservatives are not supposed to be toxic to people who eat them, the authors say it is possible that they reduce the amounts of nutrients that enter human intestinal cells.