

... Biological clock

are the human sleep-wake timekeeper is as yet indirect, based on the experiments in monkeys and observations that some humans with drastic changes in the sleep-wake cycle have damage to that region of the brain, says Moore-Ede. "These findings suggest we're on the right track," he says. "Now we must rely on experiments of nature to continue to validate the findings." □

Baby woolly mammoth blood

Intact red and white blood cells of a woolly mammoth have been found in tissue taken from the mammoth discovered frozen in Siberia in 1977 (SN: 3/18/78, p. 167). The cells are the oldest body cells to be examined in so natural a state — the animal lived approximately 44,000 years ago.

The blood cells were discovered in a gram of tissue given by Soviet scientists to Wayne State University School of Medicine in Detroit. When Marion Barnhart analyzed the dried material by scanning electron microscope, she saw the red and white blood cells in blood vessels and capillaries of the tissue. The cell membranes appear to be intact, and the white cell surfaces still have their characteristic fingerlike projections.

The blood cells resemble those of modern elephants, Barnhart says. For instance, the red blood cells are 5.3 microns in diameter, while frozen elephant cells are 5.1 microns. The mammoth white blood cells are as large as 11.5 microns across.

Barnhart also looked at remnants of skeletal muscle in the abdominal sample. She used scanning electron microscopy to locate an appropriate muscle region and then made thin slices of that tissue to examine under high magnification. The membranes and contractile fibrils are missing, she told *SCIENCE NEWS*. But there is dense material that corresponds to the characteristic A and I bands of muscle, and the Z bands, which define skeletal muscle segments, are intact. "The length of the sarcomeres [segments] is realistic compared to those of modern elephants," Barnhart says.

Others at Wayne State examining the biochemistry of the baby woolly mammoth tissue have identified collagen, the fibrous protein found in connective tissue. The scientists are analyzing abdominal muscle because they believe tissue deep in the mammoth is the best preserved. A slower rate of freezing 44,000 years ago and a slower rate of thaw more recently helped to keep the cells intact. The mammoth is the best preserved specimen that has been found in Siberia; in most cases scavengers and bacteria destroy body cells and repeated thawing and refreezing disrupt the cells. □

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EARTHQUAKE ENGINEERING AND HAZARDS REDUCTION IN CHINA: A Trip Report of the American Earthquake Engineering and Hazard Reduction Delegation—Paul C. Jennings. The purpose of the delegation was to learn about earthquake engineering research and practice in China, the Chinese earthquake prediction program, their efforts to mitigate earthquake hazards and the effects of the disastrous Tangshan earthquake of July 1976. Natl Acad Sci, 1980, 189 p., illus., paper, \$11.50.

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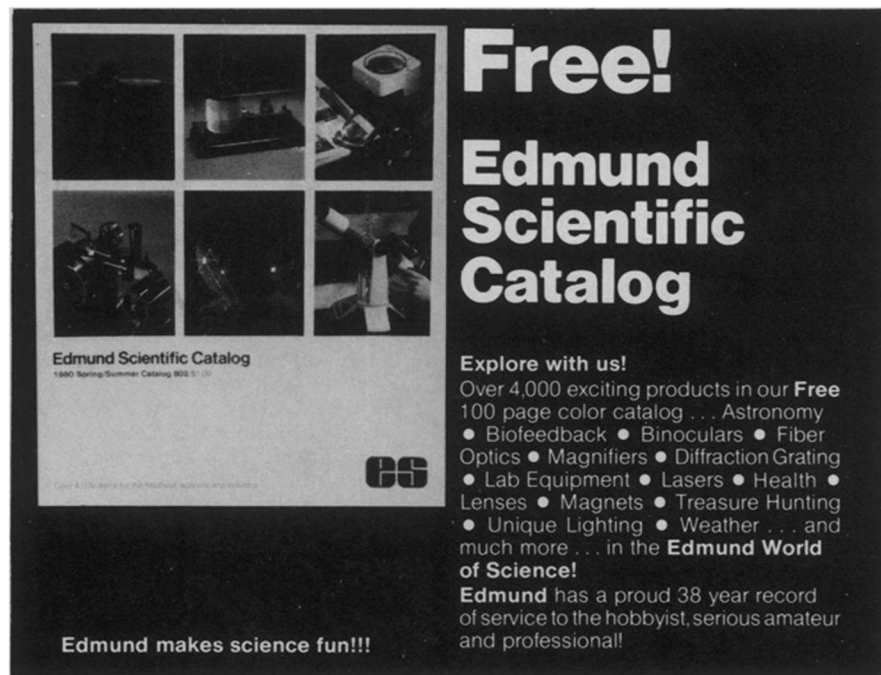
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