the valleys we see unless we can reenergize the flow system to keep water moving through the valleys over time."

Intense periods of volcanism melted frozen water to begin each wet period, they suggest. Baker notes that for water to reach higher elevations, a heat source must evaporate it, enabling the water to move and fall as snow or rain. The landforms that seem to have been sculpted by flowing water in early Martian history occur in areas that show signs of possible volcanism, he says. The apparently more recent water-carved features are concentrated at Tharsis and Elysium, two high-elevation, volcanic-looking regions with channels that may have carried water to the surrounding plains.

Baker's group argues that the episodic oceans may have been hundreds of meters deep, and that evaporation from them may have led to rainfall, snow and flowing rivers over much of Mars, rusting the planet's iron-rich rocks and perhaps even assisting in an emergence of life forms, if any ever existed there.

Terrain apparently shaped by glaciers offers another hint of water on Mars. In a separate paper presented at the Houston meeting, Kargel and Strom assert that Oceanus Borealis "supplied the atmosphere with water vapor, which then was cold-trapped as snow or frost in the high elevations in the southern hemisphere." As the ocean's climatic perturbations warmed the planet, the ice sheet eventually melted, filling cratered regions with water that flowed northward, froze again and was remelted by volcanic activity, they suggest. This renewed flow could have refilled the giant ocean, Kargel and Strom note, "completing the cycle, possibly on a repeating basis."

Over time, Baker adds, Mars would have lost much of its water as solar ultraviolet light split molecules of water vapor, allowing the hydrogen to escape into space and the oxygen to oxidize the planet's surface. Today, most of the remaining water may lie frozen beneath the surface, with some locked up in polar ice caps, he says.

Will Oceanus Borealis one day return? "Yes, certainly," Baker says, provided Mars retains its potential for a future surge in volcanic activity.

Planetary scientists need far more data to confirm this vision of a wet Mars. Useful insights may come from U.S. and Soviet spacecraft scheduled for Mars missions during the 1990s and beyond. Still, says Baker, "we feel we have found a way to make sense out of what seemed to be perplexing problems of past environmental change on the planet." □

Letters continued from p.275

Is the reader forced to think in three dimensions because the language is fundamentally three-dimensional, and if so, is language three-dimensional because of some basic attribute of the brain, or because a Euclidian metaphor is an efficient way to describe the world of a nonspherical animal under the influence of gravity and of such small size that it sees Earth's surface as essentially a flat plane? How would a writer born in the weightless environment of space describe the positions of objects, and how would readers who had spent their lives in the environment organize their imaginary spaces?

Jeffrey Roseman
Director, Center for Health Risk Assessment & Disease Prevention
Associate Professor of Epidemiology
University of Alabama
Birmingham, Ala.

In their published report, psychologists Nancy Franklin and Barbara Tversky note that the pull of gravity may be one reason why imagined objects above and below a standing observer are remembered more easily than objects located on the observer's sides. — B. Bower

CORRECTION

In "Germanium speeds transistor" (SN: 3/31/90, p.199), the fabrication process used for making the new transistors was misidentified as molecular beam epitaxy. The researchers actually used ultrahigh vacuum/chemical vapor deposition (UHV-CVD), a process invented by Bernard S. Meyerson of IBM's Thomas J. Watson Research Center in Yorktown Heights, N.Y.