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## Letters

### Conquered consumers?

In "Civilization and Its Discontents" (SN: 3/3/90, p.136), German archaeologist Thomas von der Way states that because local methods of pottery at Buto were replaced by more advanced techniques originating in Upper Egypt, the Upper Egyptians had apparently conquered Buto.

I wonder if my Japanese piano, my husband's Japanese electronics, our Japanese car and our Japanese dishes would lead future archaeologists to conclude that Japan had, in fact, "conquered" our civilization.

And maybe they'd be right!

*Delana Ann Bunch  
Oakhurst, Tex.*

### Smart art — and beyond

Ivan Amato's article on intelligent materials ("Smart as a Brick," SN: 3/10/90, p.152) got me to wondering about the application of adaptive structures to art.

Interactive art is not new, but these new

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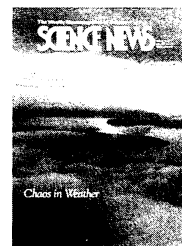
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Cover: While ancient sailors sought weather portents in the clouds that filled the twilight sky, modern forecasters perform their task using computer models of the atmosphere. Through ongoing research, meteorologists hope to learn when their models will fall prey to mathematical chaos, a force that renders forecasts unreliable. (Photo: Lawrence Radke/University of Washington)



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materials could lead to some interesting creative applications. Imagine painting with chameleon-like colors, or sculptures that change positions, or even "intelligent ink" that could, at the touch of a finger, literally spell out the subtext of a novel or provide more details encoded in the pages of a technical article.

And who knows? Maybe even snake oil could be made useful as a programmable elastopolymer that would both lubricate and massage the body!

*Jon Alexandr  
San Francisco, Calif.*

### Mutated quote

Rick Weiss quotes me as saying that I and others had been unable to duplicate the experiments of Mittler and Lenski ("Do-it-yourself evolution," SN: 3/10/90, p.149). This gives the impression that I think them guilty of some experimental error. What I actually told Rick Weiss was that some people have obtained the same result as Mittler and Lenski and some have obtained my result. That was why I went on to say that this particular example of

spontaneous mutation seems to be "a bit of a mess."

*John Cairns  
Professor of Microbiology  
Harvard School of Public Health  
Boston, Mass.*

### Gravity's pull on imagination

In "Imagined pictures possess 3-D properties" (SN: 3/10/90, p.150), researchers assert that people construct an imaginary space around themselves based on three dimensions or axes, and that "this is a powerful [mental strategy] to organize space that we use whenever we can" — for instance, in painting a mental picture of a scene described in a book.

The implication is that this is based on some innate attribute of the reader. Perhaps, however, it is the result of the three-dimensional descriptions provided by the writers — i.e., by using words like "above," "below," "front," "behind" and "right," which force the reader to think in three dimensions.

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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.

**T**errain 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." □

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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?

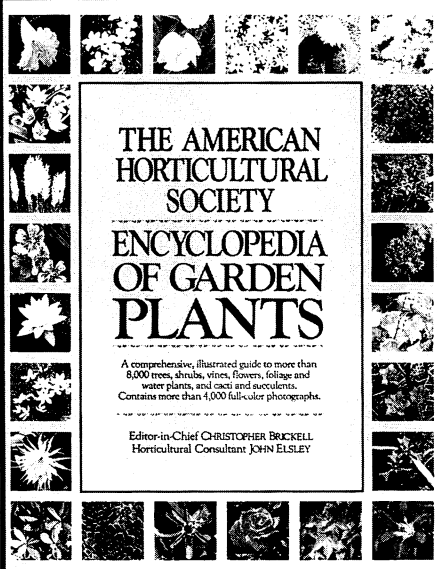
Jeffrey Roseman  
Director, Center for Health Risk  
Assessment & Disease Prevention  
Associate Professor of Epidemiology  
University of Alabama  
Birmingham, Ala.

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.



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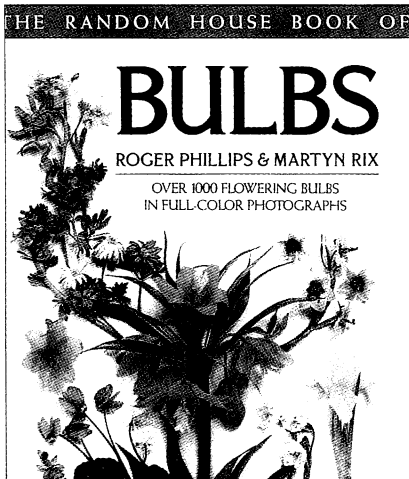
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