

attention as treatments for depression in the elderly. Tricyclics ease depression — but usually do not wipe away all symptoms — in about 60 percent of the people over age 65 studied, the panel says. However, side effects, such as lowered blood pressure and weight gain, may cause many of those given tricyclics to stop taking the drugs, the report says.

The depressed elderly get the bulk of electroshock therapy in the United States. The treatment provides short-term relief from depression, but relapses occur frequently once a series of electroshock sessions ends, the panel says. Moreover, people of advanced age have an increased risk of memory problems and confusion following electroshock.

Little research exists on psychosocial treatments for elderly people with depression, such as various forms of psychotherapy and outreach programs run by senior centers and other community programs. Combinations of biological and psychosocial treatments have not received any study, the panel observes.

Some researchers feel the paucity of research prevents any consensus on treatment. "All the research is weak," says psychologist Linda Teri of the University of Washington School of Medicine in Seattle, who did not sit on the panel. "Psychosocial research isn't necessarily weaker than biological research."

— B. Bower

## Warmth doth stretch Antarctica's tongues

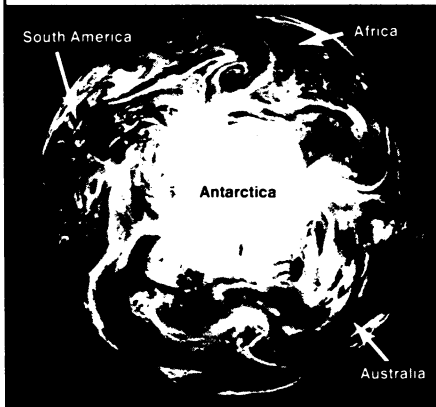
It seems as obvious as an ice cube in a glass of water. When greenhouse gases in the atmosphere warm the Earth's climate, Antarctica's glaciers should melt around the edges and shrink in size.

But glacial ice does not behave so simply. New evidence suggests that during warmer times in the past, Antarctica's icy fringes have stuck out even farther than they do today, according to Eugene W. Domack from Hamilton College in Clinton, N.Y., and colleagues from the University of Arizona and the Geological Survey of Japan. "What this says is that under warmer conditions, the Antarctic glaciers would expand rather than melt and recede," says Domack.

The team reached this conclusion after studying sediments from three sites near outlet glaciers, which carry ice from East Antarctica's interior into the sea. The three sites all sit offshore from ice shelves or smaller ice tongues, aprons of glacial ice that extend into the ocean.

Domack and his co-workers used radiocarbon techniques to date changes in the sediments corresponding to ice advances or retreats. Certain layers of the sediments contain pebbles and ground-up rocks — recording a time when the ice reached far out over the ocean. In con-

## Flyby: The world according to Galileo



Two newly released photographs reveal earthly details never before imaged from space. The photos were taken last December by the Galileo craft as it took its first swing past our planet on the way to a 1995 rendezvous with Jupiter.

The image at left offers an unprecedented view of the entire Antarctic continent as seen from above the South Pole. Researchers produced it by combining photographs taken through broad-band filters in green, red and near-infrared light. The reddish tinge indicates vegetation growing on several land areas, including South America and Australia. The varying intensities of blue-green demonstrate the different absorption properties of frozen water in glaciers, snow and clear ice, previewing Galileo's ability to distinguish similar features on some of Jupiter's chilly satellites. For example, sunlight reflected from ice paints parts of Antarctica a deep blue-green, while snow imparts a fainter hue of the same color. Glaciers form a blue-green fringe at the icy continent's lower right border.

In the image at right, centered on South America, scientists used a different set of filters to highlight features relevant to climate change. Deep red represents vegetation, most notably the Amazonian rain forests, while pink denotes a feature never before photographed from space: water vapor inside moist, low-lying clouds. (High-altitude clouds lack water vapor and appear white in the photo.) Galileo's ability to "see" water vapor stems from the use of three special filters — one red and two infrared — that transmit only a narrow range of wavelengths.

If weather satellites used similar filters to detect moist clouds, researchers could more accurately monitor the development and movement of storm systems, says W. Reid Thompson of Cornell University in Ithaca, N.Y. He released the images last week at a meeting of the American Astronomical Society's Division for Planetary Sciences in Palo Alto, Calif.

trast, other layers hold the remains of marine algae from a time when the ice edge had retreated, leaving these sites covered by open water.

In the November GEOLOGY, the researchers report that ice shelves and tongues had reached their greatest extent between 7,000 and 4,000 years ago — a time when global temperatures were about 1°C or 2°C warmer than they are today. Since then, the ice edge has retreated at these three sites.

Domack thinks that the warmer climate 7,000 years ago caused the extension of outlet glaciers. That theory dovetails with recent research on snowfall in the Antarctic, which suggests that a modest hike in air temperatures could increase the ice volume on that continent. As air temperatures rise, the atmosphere can hold more water vapor; hence, more snow would fall over Antarctica. Additional snow falling on the outlet glaciers could cause them to extend farther out over the water, says Domack.

The same does not hold true for all

glaciers, however. Ice in warmer locations lies closer to the melting point than does Antarctic ice. So any global warming should cause these less stable glaciers to retreat, Domack says.

Mark F. Meier, a glaciologist with the University of Colorado at Boulder, believes Domack and his colleagues must collect more evidence from other sites around Antarctica to prove their case. "[Their theory] may be right, but I'd hate to go to court with it," he says.

The behavior of outlet glaciers can ripple far beyond Antarctica. If these ice shelves and tongues extend in the future, they can raise global sea levels, says Meier. Conversely, increased precipitation in the interior of Antarctica pulls moisture out of the ocean, slowing the rise in sea level. Because scientists do not know which of these two processes will outweigh the other in Antarctica, they remain unsure how quickly global sea levels will rise over the next century, says Terence J. Hughes of the University of Maine, Orono.

— R. Monastersky

Images: JPL