

# Signs of Global Warming Found in Ice

High-mountain glaciers in the tropics and temperate areas of Earth show signs of accelerated climate change in recent decades, a U.S. glaciologist said last week. In Africa and Peru, glaciers are shrinking at record rates, while evidence from central Asian ice caps reveals that this area also has warmed considerably.

"These glaciers are telling us something," says Lonnie G. Thompson of Ohio State University in Columbus, who testified at a hearing before the Senate Committee on Commerce, Science and Transportation. "If you look at a global scale and see the same things happening, you have to wonder what is the common denominator."

Glaciers that exist outside the polar zones are extremely sensitive to changing conditions and may provide an early warning of abnormal climatic warming. Scientists know that the planet's average surface temperature is rising, but they cannot yet determine whether natural factors or greenhouse-gas pollutants have caused the warming. Because glaciers contain information about conditions going back hundreds of years or more, the ice records can help experts distinguish between natural and human-caused climate change.

Thompson described work at the Quelccaya Ice Cap in Peru that reveals unprecedented changes in the region. When his group took a deep core from the Quelccaya summit in 1983, they found that the year-by-year layering of ice had preserved a five-century-long record of changes in the ice's oxygen isotopes. In glacial research, scientists often study the ratio of two oxygen isotopes in ice to determine how temperatures have changed through time. But when the group returned last year, ice at the summit was melting so rapidly that the glacier had failed to preserve an isotope record for the most recent years. This degree of melting had not occurred in the previous 500 years, Thompson says.

The Ohio State scientist also described oxygen isotope studies on cores from three ice caps in China and Kirghizia, in the former Soviet Union. These analyses show enrichment of the heavy oxygen isotope, indicating a warming in these regions over the last 50 years, Thompson says. At one site, the recent warming trend exceeds any in the last 12,000 years.

Thompson reports that many tropical glaciers are shrinking dramatically. Since 1984, one glacier from the Quelccaya Ice Cap has receded up the mountain at a rate of 14 meters per year — nearly triple the speed recorded between 1963 and 1978.

Scientists studying glaciers in East Africa report seeing similar changes in



Left photo shows Peruvian glacier touching a boulder in 1977. By 1991, the ice had retreated so far that the photographer had trouble fitting both in the same frame.

Thompson

glaciers there. In the Ruwenzori mountain range of Uganda, the Speke glacier retreated 35 to 45 meters during the 19 years between 1958 and 1977. But it receded more than 150 meters in the 13-year span between 1977 and 1990, according to Georg Kaser and Bernd Noggler of the University of Innsbruck, Austria.

In Kenya, glaciers on Mt. Kenya have also receded dramatically. In the Feb. 6 NATURE, Stefan Hastenrath of the University of Wisconsin-Madison and Phillip D. Kruss of the World Meteorological Organization in Geneva, Switzerland, report that the ice-covered area on Mt. Kenya shrank by 40 percent between 1963 and 1987. The average thickness of the ice cap decreased by 14.5 meters during that same period. The scientists suggest the

glacier loss stems primarily from increasing water vapor in the atmosphere, which could be a by-product of warmer ocean temperatures.

Thompson says his findings in Peru and Asia hint that current global warming is now exceeding the normal range of climatic variation during the last five centuries — an indication that the warming is not just a natural fluctuation that will soon reverse itself. He cautions, however, that many glaciers in the polar regions are not showing the same sorts of changes. "What we're seeing are changes in the glaciers in the tropics and the subtropics that indicate warming. We do not know that the warming is driven by increasing greenhouse gases," Thompson says. — R. Monastersky

## HDL checkup recommended

Healthy people getting a blood test for total serum cholesterol should get their high-density lipoprotein (HDL) checked as well. That advice comes from an independent advisory panel appointed by the National Institutes of Health in Bethesda, Md.

HDL, often called the "good cholesterol," is a transport molecule that removes cholesterol and other potentially damaging fatty substances from the bloodstream. Scientists believe that abnormally low HDL levels increase the risk of coronary artery disease, which develops when heart arteries become clogged with fatty deposits (SN: 9/9/89, p.171). This can lead to a heart attack.

Total serum cholesterol values don't go far enough in calculating a person's risk of heart disease, the panel asserted last week. The National Cholesterol Education Program considers total serum cholesterol levels of less than 200 milligrams per deciliter (mg/dl) within the desirable range. However, after reviewing a raft of studies on the subject, the panel concluded that people with desirable total serum cholesterol may none-

theless run a heightened risk of coronary artery disease if their serum HDL levels fall below 35 mg/dl.

The NIH panel also evaluated scientific data on triglycerides — fatty substances used by the body for energy storage. The panel declined to advocate routine screening for this fat because the evidence for a direct link between triglycerides and heart disease remains inconclusive. However, high triglyceride levels may increase levels of several clotting factors that boost heart attack risk, the panel warned.

Americans with total cholesterol levels within recommended limits but who have low HDL or high triglyceride values should reconsider the familiar advice to stop smoking, lose weight and exercise, says panel chairman Elliot Rapaport of the University of California, San Francisco. The panel notes that cigarette smoking decreases HDL levels and is a "powerful risk factor for coronary heart disease." Frequently, a weight-loss program combined with a fitness regimen can raise HDL and decrease triglyceride levels, thereby lowering the risk of heart disease, Rapaport says. □