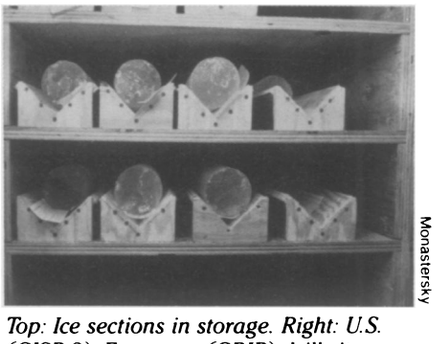
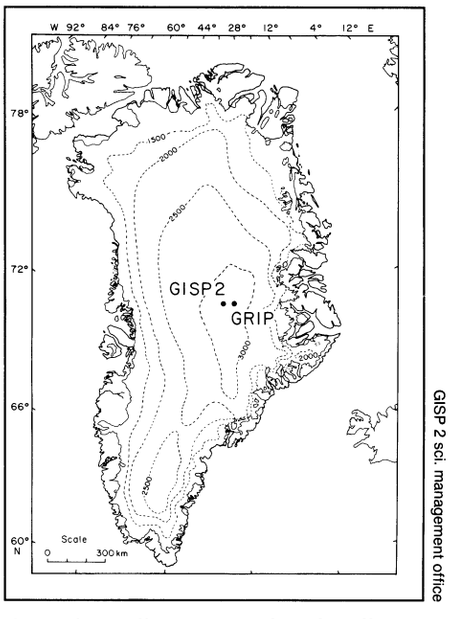
Deep ice stirs debate on climate stability



Monastersky

Top: Ice sections in storage. Right: U.S. (GISP 2), European (GRIP) drill sites.



GISP 2 sci. management office

In some realms, such as musical tastes or gustatory traditions, Europeans are seen as more conservative than their neighbors across the Atlantic. But stereotypes often fall apart. This week, a group of U.S. scientists played the cautionary role when they raised doubts about some extraordinary climate findings reported earlier this year by a European team studying ice buried deep within Greenland's frozen blanket.

Over the last four years, the U.S. and European groups have drilled separate holes through the Greenland ice sheet to collect samples containing clues about the last ice age and the interglacial warm period immediately preceding it. The ice cores can provide such information because the glacial cap built up layer upon layer over hundreds of thousands of years, trapping details about past temperatures, winds, greenhouse gas changes, and other aspects of climate.

The seven-nation European team made headlines in July when it reported that the last interglacial – called the Eemian stage – had a highly erratic climate that sometimes shifted abruptly into frigid ice age conditions and then snapped back into warmer weather (SN: 7/17/93, p.36). The findings raise concern because scientists had long thought that interglacial spans – such as the current one – were immune from the unstable climate swings that characterize glacial epochs.

American researchers, in collaboration with several European scientists, now raise questions about the evidence of climate instability during the Eemian, which lasted from 135,000 to 115,000 years ago. At a meeting of the American Geophysical Union in San Francisco and in the Dec. 9 NATURE, the investigators report that although the two ice core records yield identical information for the glacial period, they disagree about the Eemian.

"There's clearly a discrepancy between the two cores. We have to sort out what's going on," says Kendrick C. Taylor of the University of Nevada at Reno.

The Europeans drilled their ice core at the summit of Greenland's ice cap, while the U.S. team worked on the flank, 30 kilometers away – an arrangement designed to capture the very differences now surfacing. Taylor and his colleagues announce that the upper 90 percent of the 3,000-meter-long ice cores match almost perfectly: Both show the same rapid shifts in climate during the last ice age and record the remarkable stability of the current interglacial period, which started 10,000 years ago.

But measurements of oxygen isotopes in the ice and of the ice's electrical conductivity do not match for the lower tenth of the cores. In the U.S. record, this deepest section contains folded patterns suggesting that layers of ice have overturned as the glacier flowed over hills in the bedrock. Any turnovers would break the chronological ordering of layers and alter the true climate record.

Researchers are divided on how to apply these findings to the European ice. That core also contains evidence of overturning, but such questionable layers appear in ice older than the Eemian period. As yet, the investigators have not found signs of scrambled layers within that crucial interglacial span, says Heinz Miller of the Alfred Wegener Institute for Polar and Marine Research in Bremerhaven, Germany. The integrity of layering plus evidence from chemical and isotopic studies suggest that the climate actually did fluctuate dramatically during the Eemian, Miller told SCIENCE NEWS.

But some U.S. researchers say more work is needed to resolve the question of Eemian climate instability. "We're not saying they're wrong. We're simply saying it's more complicated than a nice layer-cake situation. Maybe we'll prove that they're right. We'll just have to wait and see," says Taylor. *– R. Monastersky*

Steroid injections for eye ailment slow MS

A reanalysis of a study that evaluated the use of steroids to treat inflamed optic nerves provides evidence that corticosteroid injections may delay the onset of multiple sclerosis (MS).

A chameleon among diseases, MS defies both understanding and treatment. This disorder can begin and progress erratically. It is linked to the appearance of patches in the brain where myelin, the nerve cells' protective sheath, has disintegrated. Physicians can treat symptoms, but rarely can they slow the disease's progression (SN: 3/27/93, p.197).

A diagnosis requires the separate development of two neurological problems, such as memory loss, tremors, vision problems, or partial paralysis. Recently, scientists have begun to use magnetic resonance imaging (MRI) to track the progression of this disease.

One of these neurological problems, optic neuritis, leads to sudden temporary loss or impairment of vision. Between 35 and 75 percent of those with optic neuritis later develop MS, says Donald H. Silberberg of the Hospital of the University of Pennsylvania in Philadelphia. At other times, the optic nerve becomes inflamed for different reasons.

From 1988 to 1991, 15 medical centers treated about 450 people diagnosed with their first case of optic neuritis. For two weeks, the participants got either steroid shots for three days and then pills, steroid pills alone, or pills containing no medication. The study revealed that injected steroids, followed by pills, provided marginal long-term benefit, says Roy W. Beck, an ophthalmologist at the Jaeb Center for Health Research, Inc. in Tampa, Fla. Those receiving injections simply recovered their sight a week or so faster than those who took pills. Eventually, all groups recovered equally well, a result suggesting steroids were unnecessary.

That advice may now change. The researchers have gone back and determined how many of the people who showed no signs of MS at the time they received treatment later developed this disease. "We wanted to look at indicators of risk for MS," says Beck, who headed the research project.

To their surprise, about 7.5 percent of the 135 people who got shots and pills developed MS, while 14.7 percent of the 129 patients who took steroid pills only and 16.7 percent of the 126 who took pills with no medication got MS within two years, the group reports in the Dec. 9 NEW ENGLAND JOURNAL OF MEDICINE.

However, after two years, even those who received steroid shots began developing MS at the same rate as those in the other study groups, Beck says. He and his