Earth Science

Antarctic ice shelf loses large piece

The icy apron surrounding parts of Antarctica got a little smaller in February, when a 200-square-kilometer chunk suddenly broke off. The loss of this patch may have destabilized surrounding areas enough to trigger the collapse of an entire ice shelf, says Ted Scambos of the National Snow and Ice Data Center in Boulder, Colo.

Scambos and his colleagues discovered that a section of the coastline was missing when they compared sequential satellite images of the Antarctic Peninsula. The Larsen B ice shelf—one of the many floating sections of ice that rim Antarctica—appears intact in an image from Feb. 15. In a shot taken 11 days later, part of the shelf had started breaking away. By March 23, a section of ice measuring 5 km by 40 km had disappeared.

The recent event comes 4 years after the 1,000-square-km Larsen A ice shelf disintegrated over a few days. Other ice shelves have disappeared since the 1950s, as temperatures along the Antarctic Peninsula have climbed. "The significance of these breaking up is that things that had been stable for several centuries are no longer stable," says Scambos.

The recent loss may cause the entire Larsen B shelf, which covers more than 10,000 square km, to crumble in the next year or two, says Scambos. In the Feb. 19 NATURE, an international team of researchers used a computer model to assess the health of the shelf. Although it appeared stable at the time of their writing, they suggest that "if the [Larsen B] ice front were to retreat by a further few kilometers, it too is likely to enter an irreversible retreat phase." —*R.M.*

Recent years are warmest since 1400

Temperatures in the Northern Hemisphere have climbed higher in the last decade than at any other time in the past 6 centuries, according to a comprehensive study that pooled many different climate records. The results add weight to reports linking the recent warming to greenhouse gas pollution.

Starting in the 1980s, scientists who analyze thermometer records discovered that the world has warmed since the late 1800s. The Intergovernmental Panel on Climate Change concluded in 1995 that people have caused part of this climate shift, but questions remain about how much of the warming stems from long-term natural variations. To answer this question, researchers need centuries' worth of climate information—much more than most thermometer records can offer.

Accordingly, Michael E. Mann of the University of Massachusetts in Amherst and his colleagues examined studies of surrogate measures of temperature. These include tree rings, ice cores, coral, and historical weather records. By combining such proxy measurements with a few long-term thermometer records, the researchers were able to compile a 600-year-long temperature record for the Northern Hemisphere, which they describe in the April 23 NATURE.

In their analysis, which carries a 99.7 percent level of certainty, temperatures in 1990, 1995, and 1997 exceeded all others since 1400. They concluded that volcanic eruptions and solar variations strongly influenced temperatures before 1900. Since then, warming from greenhouse gas pollution has taken the dominant role.

Other climate researchers caution that significant uncertainties plague any study of temperatures reaching so far back. "Even with all the uncertainties," says Keith R. Briffa of the University of East Anglia in Norwich, England, "the best interpretation of the data, until proven differently, is that we are seeing an unprecedented change, over quite a few hundred years, occurring in the 20th century."

Briffa and East Anglia's Phil Jones have conducted separate studies of records since 1400. Both show unusual warming in the 20th century. —*R.M.*

Nutrition

From a meeting in San Francisco of the Federation of American Societies for Experimental Biology

Strong bones: A sodium connection?

Twice as many blacks as whites in the United States experience high blood pressure—a finding that is generally attributed to blacks' propensity for retaining excess sodium from food (SN: 10/19/91, p. 254). A new study finds that this sodium retention begins before adulthood.

Because sodium retention leads to calcium retention, the observation offers a provocative explanation for why black girls tend to build stronger bones than their white counterparts—thereby lowering their risk of osteoporosis later in life.

To study calcium in adolescence, when girls lay down about 40 percent of their bone mass, Connie M. Weaver and Christina Palacios of Purdue University in West Lafayette, Ind., invited 12- and 13-year-olds—five black and five white—to attend one of two 3-week summer camps. As the girls played, the nutritionists recorded every milligram of sodium and calcium eaten and excreted. Calcium intake never varied, but the diet provided slight peaks in sodium intake, enabling the scientists to document later increases in sodium excretion.

"Peaks were held by the blacks for several days longer than the whites," Weaver told SCIENCE NEWS. "Not to make too much of this," she says, "it does hint at what may be true underlying racial differences for disease problems." It also suggests that a low-salt diet may be especially useful in adolescence to increase bone mass as a defense against osteoporosis later in life, she adds.

Because sodium retention usually translates into transient weight gains—but didn't in this study—her team is now designing a larger follow-up study to see if it missed something, such as sodium's excretion in sweat or incorporation into bone.

The researchers were originally interested in sodium intake as a major regulator of the calcium available to make bone. In the kidneys, sodium and calcium leave the body via the same tubules. Indeed, each sodium ion drags a calcium ion along, explains Weaver. Because the body acts to maintain a set concentration of sodium, "if you eat more of it, you'll excrete more—and drag out calcium with it, even if you need that calcium." —*J.R.*

Tallying wheat bran's gutsy benefits

Though many studies have indicated that diets high in wheat bran can reduce an individual's risk of developing colon cancer, the data have appeared somewhat equivocal, acknowledges David M. Klurfeld of Wayne State University in Detroit. Contributing to the problem, he notes, is the difficulty of documenting human diets. "People don't remember what they ate last Tuesday, much less 6 years ago."

However, he says, a few have failed to detect a wheat bran benefit even among animal studies, where diets can be "impeccably well controlled." To probe the significance of such contrary findings, Klurfeld conducted a metanalysis on some 30 well-designed studies that together included more than 3,000 rodents. Metanalysis combines data collected from numerous smaller studies—of mice and rats, in this case—in order to increase the statistical power of the inquiry.

Klurfeld observed a 32 percent reduction in colon cancer risk in animals that ate wheat bran, based on the data "from all of these studies—including those reporting no effect or an enhancement of risk." He says he was particularly "surprised by the very narrow range, 20 to 40 percent, on the [statistical] limits for this reduction." Further statistical analysis indicated that the finding is "very unlikely" to be overturned, even by 100 additional animal studies of similar size.

Klurfeld would like to perform a similar metanalysis of human studies on wheat bran's role in preventing colon malignancies, the third leading cause of cancer deaths in the United States. —*J.R.*

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