any more precisely than sometime in the last 1.3 million years.

Whatever the exact date, the recent collapse of the WAIS is no longer in doubt. Now the question is when the WAIS might disintegrate again as the world warms—and how rapidly it might flood low-lying coasts.

Glaciologist Johannes Weertman of Northwestern University put a scare into the field 25 years ago when he argued that the ice sheet, sitting on a concave bed that is below sea level and fringed with floating ice shelves, should be prone to collapse rapidly if the climate warms. He explained that even a slight warming-induced retreat of the ice's grounding line—where it begins to float off the bottom—will move the grounding line into thicker ice. The thicker the ice, the faster it flows outward and therefore the faster it thins. The faster it thins, the sooner it floats and moves the grounding line even farther inward. Such an accelerating retreat could consume WAIS in a matter of a century or two, Weertman argued. The ice sheet retains a modicum of stability, researchers came to believe, only because its ice shelves are wedged into semi-enclosed embayments like the Ross Sea.

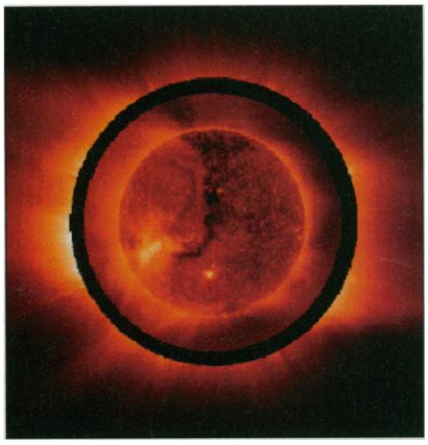
Researchers have relaxed a bit since then as they have come to appreciate that spotty resistance along the ice sheet's bed is also helping to hold it together. But Scherer's finding comes on top of some more alarming recent predictions. Staff scientist Michael Oppenheimer of the Environmental Defense Fund in New York City recently reviewed the question of WAIS stability (*Nature*, 28 May, p. 325) and concluded from the ice sheet's somewhat erratic behavior of late that its most likely fate is disintegration during the next 500 to 700 years, greatly accelerating sea-level rise beginning in the 22nd century. If that scenario comes to pass, it will be small consolation to Florida landowners to know that it has all happened before.

–RICHARD A. KERR

SOLAR PHYSICS

Earth to SOHO, Come In Please

Controllers have lost contact with one of the most productive solar astronomy satellites ever. While controllers were putting SOHO—the Solar and Heliospheric Observatory—through routine maneuvers on Wednesday, 24 June, a safeguard program kicked in unexpectedly, apparently sending the craft into a spin. The craft's high-gain communications antenna is no longer pointed toward Earth. Although communication should still be possible through two omnidirectional low-gain antennas, "so far the baby does not talk back to us," says Franco Bonacina, a spokesperson for the European Space Agency (ESA) in Paris.



NASA/ESA

Darkened sun. SOHO is no longer capturing views of the sun such as this image of the corona.

SOHO, a joint NASA-ESA project, was launched in December 1995 and has since been monitoring the sun with 11 different instruments from a vantage point 1.5 million kilometers sunward from Earth. The $1 billion mission has gathered data on everything from the sun's internal structure (*Science*, 26 June, p. 2047) to outbursts of gas from the sun's atmosphere, called coronal mass ejections. SOHO's success persuaded planners to extend its operations—originally meant to end last spring—through 2003, to allow the spacecraft to observe the sun as its 11-year cycle of activity peaks.

"The next couple of years would have been a different mission, because the sun is a different sun," says Bernhard Flick, ESA Deputy Project Scientist for SOHO at NASA's Goddard Space Flight Center in Greenbelt, Maryland. As a result, last week's mishap is "potentially a tremendous loss," says Cambridge University's Douglas Gough, co-investigator on three experiments studying solar oscillations, which hold clues to the sun's structure and motions.

The crisis began when controllers at Goddard began a maintenance operation for the spacecraft's orientation system, which spins reaction wheels to rotate the craft. These reaction wheels often accumulate momentum during corrections, and NASA spokesperson Bill Steigerwald explains that the technicians fired thrusters to hold the craft steady while the reaction wheels were slowed. The craft then suddenly entered the "emergency sun reacquisition mode," which automatically fires thrusters to point SOHO back toward the sun if it loses its bearings. "The telemetry stopped before the thrusters stopped firing. The reason is not clear at this time," says Steigerwald.

SOHO researchers now face a tense wait to see whether the mission can be saved. The satellite's solar panels are probably turned away from the sun now, draining the batteries and making communication impos-

ScienceScope

HENNEY NO SHOO-IN

Critics are urging caution as the Senate considers the nomination of Jane Henney, vice president for health sciences at the University of New Mexico, to head the Food and Drug Administration (FDA).

Henney—formerly number two at FDA under David Kessler—has been praised by many public health leaders. But some medical industry officials question her commitment to streamlining the FDA bureaucracy and speeding up the drug approval process as mandated by a law passed last year. Steve Northrup, director of the Medical Device Manufacturers Association of Washington, D.C., also worries about her ability to strike an "appropriate balance" between the interests of consumers and manufacturers. Henney co-chaired a panel that in 1992 persuaded the FDA to impose a moratorium on breast implants, a decision that, Northrup says, was based on a poor reading of the science. Some conservative members of Congress also look askance at Henney because of her ties to perceived archliberal Senator Edward Kennedy (D–MA). Her husband, Robert Graham, worked on the staff of the senator, who is her strong supporter.

Senator James Jeffords (R–VT), chair of the Labor and Human Resources Committee, has responded to critics by saying Henney's confirmation hearing, which will probably be held in August, "is not going to be a quick one."

POPULISM AND PEER REVIEW

The old elitism-versus-populism conflict has popped up once again as the 1999 budget for the National Science Foundation (NSF) moves through Congress.

The Senate bill gives NSF $12 million to add three new science and technology centers (STCs), for applied molecular biology, to its existing roster of 24. But the nation's top research universities—defined as the 100 now getting the most NSF money—wouldn't be allowed to compete. The agency's peer-review system is "biased toward more established institutions," explains the report.

Nils Hasselmo, new president of the Association of American Universities, which represents most of those top schools, disagrees. Federal R&D funds should go where the expertise is, he says, and not be "a subsidy to universities." The House concurs: A spending panel last week voiced its support for peer review as the determinant in making STC awards, setting the stage for a compromise later this summer.

sible. "There is a slight chance that the orbit may eventually take SOHO to a point where the solar panels are aimed at the sun," says Steigerwald. This would power up the craft and perhaps enable controllers to make contact with it again.

A team of specialists from ESA and from Matra Marconi Space, the builder of the craft, has gathered at Goddard to plan the rescue effort. "We haven't lost [SOHO] yet," says Gough. "I'm still optimistic."

–ALEXANDER HELLEMANS

Alexander Hellemans is a writer in Naples, Italy.

GENOMICS

Canada Proposes $175 Million Effort

OTTAWA—The Medical Research Council (MRC) of Canada has pledged $17.5 million toward a 5-year, $175 million national genomics initiative aimed at reestablishing the country's global position in the rapidly growing field. The money would seed a project much more ambitious than the one terminated in 1996 as part of government-wide austerity moves. First, however, the project's backers must raise more than $100 million in additional funds from the federal government and nearly $50 million from business and other sources.

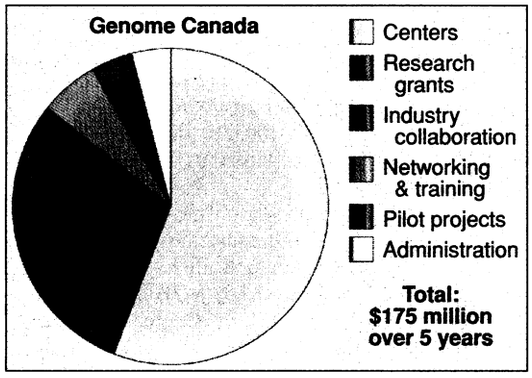
"The potential advantages to Canada are enormous," says Marc LePage, MRC's director of business development. "The initiative will address major diseases that affect a lot of Canadians, while helping to train young researchers in promising new areas like bioinformatics. Also, there's an economic advantage from industrial spin-offs that come from the field. Canada will be taking a major step forward here."

The initiative, called Genome Canada, would be the successor to the Canadian Genome Analysis and Technology program, created in 1992. Genome researchers have struggled to find support since its dissolution. "We've been thinking and talking while other people have been moving ahead," says geneticist Lap-Chee Tsui, head of the Centre for Applied Genomics at the Toronto Hospital for Sick Children. "We definitely lost a lot of ground in the meantime."

Tsui, who chaired an MRC-appointed Genome Task Force that crafted the proposal, says what's envisioned is a "structured" program focused on basic genomics research that can feed the growth of biotechnology companies across agriculture, forestry, the environment, and health care. "This time," he says, "we should have bigger centers and a much more coordinated effort, more targeted instead of purely investigator-driven."

The task force's report, which was adopted by MRC's governing board on 19 June, casts Genome Canada as a "virtual national institute" or consortium. In addition to managing a multidisciplinary research effort, it would help to broker early-stage and spin-off companies. The biggest component of the program, about $98 million, would be centers of research excellence in six fields: genome mapping and large-scale sequencing (with the goal of sequencing 25 to 50 megabases of DNA per year at three or four sequencing facilities); functional genomics; genotyping technologies; proteomics; bioinformatics; and medical, ethical, legal, and social issues.

Genome Canada joins a spate of proposals—like the Canadian Institutes of Health Research (*Science*, 8 May, p. 821)—rising like hot-air balloons in the suddenly balmy economic climate. But staying aloft will be a challenge. The magnitude of the projected federal contribution, some $108 million, will likely require a special Cabinet appropriation, and the Liberal government of Jean Chretien has warned repeatedly that talk of how to spend a sudden budget surplus is premature. The business plan also includes raising $28 million from pharmaceutical and biotechnology firms, $14 million from provincial governments, and $7 million from nonprofit organizations and foundations.



Ambitious plans. New initiative would link research, training, and applications in a "virtual national institute."

Although proponents admit they have set their sights high, they remain optimistic. They are hopeful that their efforts will be incorporated into a national biotechnology strategy expected to be issued this fall by Industry Minister John Manley. A report last fall by an outside panel of experts urged him to create such an initiative as a necessary condition of a flourishing biotechnology sector. "Everybody seems to be very much aware of genomics and the fact that Canada wants to play a big role in biotechnology," says Tom Hudson, assistant director of the Whitehead Center for Biomedical Research at the Massachusetts Institute of Technology and assistant professor at McGill University in Montreal. "We're thrilled [by MRC's announcement]."

–WAYNE KONDRO

Wayne Kondro is based in Ottawa.

SPACE

Remodeled ESA Backs Applications Projects

The European Space Agency's (ESA's) governing council last week approved development money for a new satellite-based navigation system, ESA's revamped Earth-observation program, an upgrade for the Ariane-5 rocket, and a new launcher for small satellites. The decisions demonstrate the agency's increasing focus on space applications since Antonio Rodotà, took over as the agency's director-general last July (*Science*, 5 September 1997, p. 1426). But the council's apparent unanimity masks major disputes that loom over some programs. Some heavy politics are in store before the more senior council of European space ministers decides next year on whether to implement the programs, and how much to spend on them.

MRC OF CANADA

The Earth-observation program is one potential area of discord. The ESA council is requesting about $330 million per year for a new program of scientific and applications missions (*Science*, 16 January, p. 316). But some countries think this is excessive. "We approve of the ideas," says Gérard Brachet, head of the French space agency CNES, "but they are aiming too high. We think [$190 million] per year is enough." Roy Gibson, the agency's first director-general and now a member of two panels advising ESA on Earth observation, is sympathetic to some reduction, but he says a level of $190 million would threaten the science content.

Even larger battles loom over the proposed satellite navigation system. ESA is hoping to develop both ground-based and satellite-borne equipment that would, during a first phase, make use of signals from the U.S. Global Positioning System (GPS) and Russian Glonass satellites to provide precise position information across Europe. A second phase, slated for 2010, could be anything from a joint system with the United States and the Russians to an independent European system. France, however, is concerned that the United States might deny access to GPS signals in some circumstances and seems to favor a European solution, while the United Kingdom prefers transatlantic cooperation. "This is a decision that will be taken at prime ministerial level," says Brachet.