to be identified. "EMBL should honor its contract" with the staff.

But at the moment, a slim majority of current staff is in favor of compromising. In a vote conducted by EMBL's staff association last month, 54% of the staff said they would be willing to accept the 2.1% figure, while 46% insisted upon the 8% interpretation. In a 23 November letter to the council delegates, which *Science* has obtained, the staff association warned that despite this slim majority in favor of the less costly interpretation, "individual members of staff would continue the case" by appealing to the ILO, and went on to urge the council to "consider implementing the 8% salary adjustment." Such an outcome "will be a substantial financial challenge to the laboratory," Kafatos told *Science*. But he says that he will argue "forcefully" that EMBL's scientific program must go ahead despite the costs. "The focus has to be on science."

That scientific program will be put under more pressure next year by the need to make up for the withdrawal of the European Union as a funding partner for EBI. Until the council can get government approval to increase its funding to EBI next March, the MRC has offered to loan EMBL enough money to keep the center running. "EBI is not out of the woods yet," says Graham Cameron, co-head of the institute. Cameron adds that although the council "has expressed a clear intention to insure that the 2000 budget will be up to the 1999 level ... our [$8.3 million annual] budget is still less than half that of our peers in the United States"—namely the National Center for Biotechnology Information (NCBI) in Bethesda, Maryland, whose yearly budget is about $19 million. Catching up with the NCBI is a key component of EMBL's 5-year plan for 2001–05, a draft of which Kafatos presented at the council meeting.

Despite these uncertainties, many EMBL scientists expressed satisfaction that the council had acted quickly to deal with the crisis. "The council has taken the high road, and that is very good for EMBL," Cameron says.

—MICHAEL BALTER

BIOMEDICINE

Cholesterol-Lowering Drugs May Boost Bones

Most drug side effects are unwanted, but a newly discovered "side effect" of the statins, drugs taken by tens of millions of people to lower their cholesterol levels and presumably their risk of heart disease, may in fact be beneficial. On page 1946, a team led by endocrinologist Greg Mundy of the biotech company OsteoScreen and the University of Texas Health Science Center in San Antonio shows that statins trigger bone growth in tissue culture and in rats and mice. If they have the same effect in humans, statins could be the first drugs able to increase bone growth in patients with osteoporosis, the bone-weakening condition that often afflicts postmenopausal women.

The observation could be "a real breakthrough" in osteoporosis treatment, says Lawrence Riggs, an endocrinologist at the Mayo Clinic in Rochester, Minnesota. "If you can thicken remaining bone, you could theoretically bring bone mass back to normal" in patients, he says. "We have not had effective treatment for that." Drugs available today can slow ongoing bone loss but cannot fully repair weakened bones.

Heartfelt aid. Cholesterol-lowering statin drugs might help restore bones weakened by osteoporosis *(top)* to normal density *(bottom)*.

Statins lower blood cholesterol concentrations by blocking an enzyme called HMG Co-A reductase, which the body uses to synthesize the lipid. But there were already hints that the drugs might have broader effects. A meta-analysis published in the journal *Circulation* last year, for example, showed that people taking the drugs in large clinical trials had lower death rates from all causes, not just heart disease. Even so, Mundy says, finding an effect of statins on bone came as a "total surprise."

He and his team had been screening a library of 30,000 natural compounds to find potential bone-strengthening drugs. They tested the molecules in cultured mouse bone cells, looking for any that could increase the production of bone morphogenetic protein–2

CREDITS: (LEFT TO RIGHT) DEMPSTER *ET AL., J. BONE MINER. RES.* 1, 15 (1986); DARESBURY LABORATORY

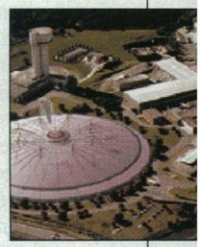
ScienceScope

DESY Debate Researchers are contesting a one-man campaign to shutter Germany's flagship particle physics facility. In an article last month in the magazine *Der Spiegel*, physicist Hans Grassmann charged that the Deutsche Elektronen Synchrotron (DESY) in Hamburg conducts "irrelevant physics" and advocated making better use of its $140 million annual budget. In response, DESY's directors, led by physicist Albrecht Wagner, posted a four-page rebuttal on the lab's Web site, along with more than 50 endorsements from physicists around the world. In one, Fermilab director Michael Witherell calls DESY "one of the world's most important physics laboratories."

But Grassmann, a German who recently joined Italy's University of Udine, contends that DESY's scientific output has been poor. And he denies that his attack was motivated by his failure to win a job at DESY, where he worked briefly as a student. But Grassmann has found few allies so far. Because German scientists fear reprisals, he says, it is "almost impossible" to find physicists "who would make such criticisms in public."

Choices, Choices The saga of where to build DIAMOND, Britain's new $290 million synchrotron x-ray source, has taken some new twists. Just as he was expected to announce which of two sites had won the machine, Trade and Industry Secretary Stephen Byers last week told Parliament that he will put off the choice until next month pending the completion of two new government studies.

Along with the delay came word that the charitable Wellcome Trust, which is footing $184 million of DIAMOND's construction costs, favors one competitor: the Rutherford Appleton Laboratory (RAL) near Oxford (*Science*, 22 October, p. 655). Indeed, trust officials asserted in a statement last week that their discussions with Byers's department and the French research ministry, which is contributing $57 million to the project, "have been based on the understanding that the ... RAL site was the preferred location." Wellcome said DIAMOND would face engineering problems at RAL's rival, the Daresbury Laboratory near Manchester.



But such claims are "flimsy," charges physicist Graham Bushnell-Wye, who helps run the "DIAMOND at Daresbury" campaign. And he predicts Daresbury is going to do just fine in the new studies, which will weigh engineering issues and opinions in the scientific community.

dying or restoring their ability to function.

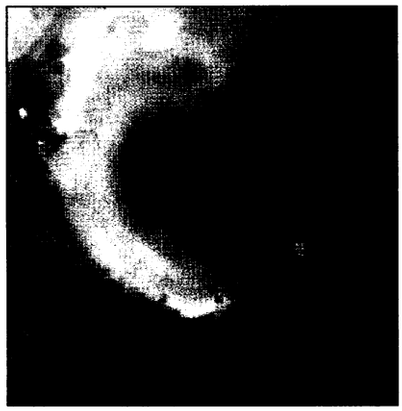
Choi's team is now examining the various possibilities so that they can determine how to get better results. "We've got to figure this out," Choi says. "Otherwise it's a random walk." They would also like to extend the delay before treatment from 9 days to a month or two, which would be a better test of prospects for fixing human spinal cord injuries that are years to decades old. Nevertheless, Choi is thrilled to have taken this first step. "We're breaking new ground," he says. –INGRID WICKELGREN

PLANETARY SCIENCE

Another 'Ocean' for a Jovian Satellite?

Oceans seem to be popping up everywhere among the satellites of Jupiter. First it was Europa's 100-kilometer-deep, ice-encrusted ocean, which might even harbor some life; then Ganymede and Callisto's deep waters turned up, buried deeper than Europa's. Observations from the ground and the Galileo spacecraft now suggest that it may be fiery Io's turn. But there are no tantalizing prospects for life in Io's proposed ocean. At something like 2000 Kelvin, the ocean seething beneath Io's volcanoes and lava lakes would vaporize the hardiest creature, for this ocean would consist of molten rock.

If Io's magma ocean is really there, it may be fueling geologic "processes we don't see on Earth and that haven't been seen in billions of years," notes geophysicist Susan Kieffer of Kieffer & Woo Inc., in Palgrave, Canada. The magma ocean that roiled Earth in the earliest days of the solar system left no geologic record, but Io could be a living example of how an infant planetary body shapes itself.



A hot spot. Io's volcano Pele glows at 1300 Kelvin (central red dot) in the infrared.

CREDITS: (TOP TO BOTTOM) SAM OGDEN PHOTOGRAPHY; JPL/NASA

When the Voyager spacecraft returned the first closeup images of Io in 1979, planetary scientists learned that it is outrageously active. More recent observations from Earth and now from the Galileo spacecraft have shown just how extreme its volcanism is. Io's huge calderas dribble lava onto the surface at temperatures exceeding 1500 K, when the hottest terrestrial lavas today are hundreds of degrees cooler (*Science*, 17 April 1998, p. 381). Such high temperatures implied compositions with high proportions of magnesium and iron, called ultramafic, which would raise the melting point of the rock. Hot ultramafic lavas were common billions of years ago when Earth itself was hotter but have been scarce since.

In the October issue of *Icarus*, planetary geologists Laszlo Keszthelyi and Alfred McEwen of the University of Arizona, Tucson, and Jeffrey Taylor of the University of Hawaii, Honolulu, consider what Io's surface might be saying about the satellite's interior. Jupiter's gravity kneads Io, driving heat through the interior. Keszthelyi, McEwen, and Taylor calculated that if Io is solid down to its liquid iron core, as Earth is today, Io should have thoroughly extracted silica-rich magmas from its rock to form a thick, silica-rich crust. In this scheme, the crust would now melt from place to place to produce lavas with a low melting point, just the opposite of what is seen.

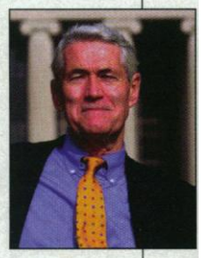
So Keszthelyi and his colleagues assume that Io never managed to extract much silica-enriched magma from its interior. In their preferred model, beneath a 100-kilometer-thick crust built of silica-poor lavas churns an 800-kilometer-thick magma chamber that melts away the bottom of the crust as fast as surface lavas build it. Their calculations suggest that the magma would be heavy with mineral crystals—more so toward the bottom as increasing pressure encourages their growth.

This mushy magma ocean must be global, the researchers conclude, to feed the volcanic hot spots that seem to be uniformly distributed over Io's surface—Galileo observations have yielded 100 of these so far and counting. Io's mountains, which range up to 10 kilometers high, are also evenly distributed, so they may be blocks of crust tilting as they founder into the magma ocean below. The early Earth or moon may have looked this way, says McEwen, before it cooled enough to solidify.

"The evidence for globally distributed magma plumbing is very good," says Galileo project scientist Torrence Johnson of the Jet Propulsion Laboratory in Pasadena, California. "That implies a global source." But short of dropping seismic stations onto the surface, he says, proof may be hard to come by. Still, McEwen suggests at least two ways Galileo might help. During its last scheduled flyby of Io, made on Thanksgiving Day, the spacecraft recorded magnetic observations that may show whether Io generates a magnetic

ScienceScope

Northbound MIT's dean of the school of science, Robert Birgeneau (below), will leave the Cambridge, Massachusetts, campus next summer to become head of his alma mater, the University of Toronto. That's causing jitters among the women faculty at MIT, who praise the physicist as their most important advocate in a long battle to address gender inequality (*Science*, 12 November, p. 1272). But Lotte Bailyn, an MIT management professor and former faculty chair, is optimistic that the issue won't die with the dean's departure. And Birgeneau himself says that the effort to address inequality issues "is in transition—but there's enough momentum" to ensure that the issue remains on the front burner. Both academics note that the other four MIT schools have already organized committees to examine the status of faculty women similar to the one Birgeneau helped create.



Who's No. 1? Japan's investment in research has reached record levels. According to new figures from the country's Management and Coordination Agency, total R&D spending was $122 billion for the year ending on 31 March, a 2.5% increase over the previous year despite an economy that shrank by 2.1%. Japan devoted 3.26% of its $3.7 trillion gross domestic product to research, well ahead of the 2.79% figure posted by the second-place United States for its $8.8 trillion economy (*Science*, 29 October, p. 881), although the countries use different accounting methods.

The 1998 numbers for Japan show that public spending grew by a robust 9%, to $27 billion, while spending by the recession-battered private sector edged up 0.7%, to $95 billion. "Given the severe [economic] conditions, the spending trend is very positive," says an official at the Science and Technology Agency.

The government's share of the spending pie rose to 21.7% in a deliberate effort to bring it in line with rates for other industrialized countries. Meanwhile, the U.S. government's contribution to R&D spending continues to drop, reaching a record low of 26.7% of a projected $247 billion in 1999. Ironically, many U.S. officials are wringing their hands at the declining federal contribution, caused largely by a surge of industrial R&D in conjunction with a booming economy.

Contributors: Robert Koenig, Dan Clery, Andrew Lawler, Dennis Normile