RANDOM SAMPLES

edited by CHRISTOPHER ANDERSON

Labor to Kill 'Shortage' List

The government is backing down from its controversial list of fields and states with a purported shortage of scientists that was drawn up to make it easier for companies to hire foreign scientists.

As required by the 1990 Immigration Act, the Department of Labor commissioned a study of national labor markets that found a supposed shortage of biological, chemical, materials, and computer scientists in some two dozens states. Using those results, Labor announced a proposed program earlier this year in which employers in those states would have been able to hire foreign scientists without going through the lengthy shortage "certification" process normally required (*Science*, 7 May, p. 748).

But hundreds of scientists, tipped off by staffers on the House of Representatives government operations subcommittee on employment, housing, and aviation, flooded the Labor Department with letters describing the difficulty they and their colleagues face in finding jobs in the fields and states in which shortages were said to exist. Researchers included rejection letters, job advertisements showing low salaries, and their own resumes. Labor received more than 500 letters, with only three reportedly in favor of the proposal.

Now the agency has quietly cried "uncle." On 14 May Labor Secretary Robert Reich asked Congress to remove from the law the language requiring the project, thereby freeing Labor to kill it. "Since the [Immigration] Act became law, the nation's economy has changed," Reich said in his letter. "Unemployment has increased, including in the highly technical fields, as a result of such things as the restructuring of some major U.S. corporations and defense reductions." Staffers for the Senate committee with authority over the act say they will modify the act's language so that Labor can kill the project.

CHUCK MUSSI/NAVY PHOTO

Both sides of Arctic ice. Civilian researchers taking their first sub-ice cruise in a nuclear submarine will also pop up for a look.

Arctic Research: The Cold War Chills Out

With a prod from the Russians, the U.S. Navy is turning one of its most powerful weapons to the task of exploring perhaps the least charted region on the globe: the perennially ice-sheathed Arctic Ocean. For decades, civilian oceanographers have dreamed of cruising for weeks beneath the Arctic ice pack in a nuclear submarine, inspecting the ice above, the sea floor below, and the water all around. Right now they must drift around the Arctic and poke the occasional hole in the ice, studying whatever happens to be there.

This summer, for the first time, a U.S. Navy attack submarine will carry six civilian researchers beneath the ice for 19 days, studying everything from plankton to Earth's varying gravity field. Congress earmarked $3 million in the Navy budget to cover operational costs.

Marcus Langseth of Columbia University's Lamont-Doherty Earth Observatory suspects the Navy's friendlier attitude is an effort to demonstrate the value of a cold war asset in the new world order. Perhaps not coincidentally, Russian scientists recently proposed converting one of their subs for geophysical survey work in the Arctic.

This year's cruise may be followed by a longer one in 1995. But the Navy is still balking at requests to declassify data collected by U.S. nuclear submarines ever since the *Nautilus* cruised under the ice in 1958. Last year the Navy released new ice-thickness data, but further data, including measurements of bottom topography, have remained secret. Now oceanographers and climate researchers are hoping for a new kind of "cold war": a race to collect and make available Arctic data.

From Shuttle Tiles To Bone Implants

The ceramic tiles that protect space shuttles during reentry may be moving from outer space to inner space, thanks to a surprising observation by Thomas Aufdemorte, a pathologist at the University of Texas Health Science Center in San Antonio. Looking at the tiles under a scanning electron microscope, Aufdemorte noticed that they looked just like trabecular bone, the porous structure inside bones, and pegged them as a candidate for bone implants.

At the moment, most bone replacement and implant materials are made from titanium alloys, chrome-cobalt alloys, polymeric materials, or banked bones from cadavers. But these are vulnerable to rejection, infection, and wear. Although it is too early to predict whether the tiles, composed of borosilicate glass laced with tiny silica and alumina fibers, will meet the stringent criteria for medical implant materials, they are lightweight and porous, just a bit more dense than balsa, notes NASA materials scientist Howard Goldstein of Ames Research Center, who is working on the project. And the material appears to be biocompatible. Preliminary data from samples implanted in several baboons found that they failed to elicit adverse reactions.

At least one party, biomedical engineer Casey Fox of Biomedical Enterprises Inc. of San Antonio and a longtime collaborator with Aufdemorte on the response of bone in space, is interested in commercializing the material if it survives the multiyear obstacle course required by the Food and Drug Administration for certified medical products.

Press Takes Parting Shot at Station

National Academy of Sciences president Frank Press ended his 12-year term last week by taking a shot at the embattled Space Station Freedom. Testifying before the science subcommittee of the Senate Commerce, Space, and Transportation Committee on a new academy report about setting national goals in science (*Science*, 25 June, p. 1871), Press was asked by chairman Jay Rockefeller (D–WV) to use the station as a test case for the report's suggestion that the government make scientific funding decisions based on the importance of a particular area and how well the United States is doing compared with the rest of the world. Does the potential scientific payoff justify a $30 billion engineering project?, wondered Rockefeller.

"It's not a scientific question," Press answered. "Not even with regard to creating better crystals in microgravity?" persisted Rockefeller. "Especially crystals," Press replied. "Very few companies have been willing to put up money for

research on materials processing. As a geologist, I'm in favor of exploration of other planets, which is the real purpose behind the space station. But most of that work can be done with unmanned probes."

The dialogue continued for a few minutes before Rockefeller threw in the towel: "What you're really saying is that [a decision on the space station] is my problem, not yours, right?" Replied Press, "That's right."

Five Failed Controversial Olympics Sex Test

Five female athletes failed a controversial PCR-based genetic sex test in its Olympic debut last year in Barcelona, according to the Spanish scientists who conducted the tests and reported their results in last week's *Lancet*. Four of the five athletes, who were the only ones of 2406 women tested to score positive for a gene specific to the Y chromosome, agreed to follow-up physical exams. All four were found to have unspecified "morphological abnormalities." But the International Olympic Committee did not disclose whether the women were allowed to compete.

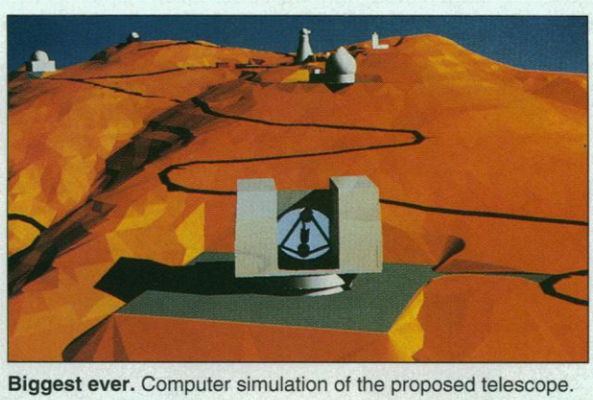
This 1-in-500 incidence of Y-positive females athletes is considered about average in world-class competition, says Yale University pediatrics researcher Myron Genel. But he and a number of other researchers active in sex-testing issues are nevertheless fighting genetic testing in sports. They argue that the presence of a Y chromosome should not be grounds for disqualification, and that genetic tests discriminate against—and potentially humiliate—athletes who are physically female in appearance, despite the genetic abnormality of a Y chromosome. The argument is winning some converts. One prominent Spanish geneticist refused to conduct the tests for the Olympics last year, and the International Amateur Athletic Federation has since decided to eliminate gender testing altogether for the competitions that it sponsors.

NIH Survey: Scripps-Sandoz Deal Unusual

Controversial provisions in the Scripps Research Institute's $300 million deal with Sandoz Pharmaceuticals Corp. are an "aberration," Bernadine Healy testified last month in her final congressional appearance as director of the National Institutes of Health (NIH). To support her claim, she released a preliminary analysis of an NIH survey of some 100 institutions engaged in 375 similar research deals with industry. NIH found that:

- 86% of the agreements are specific to a particular project;
- 22% allow the industrial partner to delay research publications by more than 60 days;
- More than 90% are for $5 million or less and extend for 5 years or less;
- No agreements permit the industrial partner to place representatives on the institution's board of directors and none requires the institution to help obtain a waiver to a requirement of the Bayh-Dole Act that gives preference to U.S. companies in manufacturing the fruits of such collaborations.

In contrast, the proposed Scripps-Sandoz contract would have given Sandoz rights to virtually all Scripps research; allowed Sandoz two representatives on the Scripps board of trustees; asked Scripps to seek an exemption to the U.S. manufacturing clause of the Bayh-Dole Act; and lasted for 10 years with an additional 10-year option. Scripps and Sandoz are revising the contract to bring it more in line with the norm (*Science*, 25 June, p. 1872).



Biggest ever. Computer simulation of the proposed telescope.

Roll Over, Keck Telescope?

With its 10-meter primary mirror, Hawaii's Keck is the world's largest optical telescope. But a Scandinavian team is now finishing the design for a 25-meter instrument that would dwarf both the Keck and the European Southern Observatory's (ESO) Very Large Telescope (VLT) in Chile, a four-telescope array that will steal the Keck's mantle when it is completed in 1999.

The best way to produce mirrors larger than 8 meters in diameter is to build them from hexagonal segments. But piecing the mirrors together into the parabolic shape used in modern telescopes is extremely difficult. So Lund University astronomer Arne Ardeberg in Sweden and telescope engineer Torben Andersen of the Risø National Laboratory in Copenhagen have devised a novel solution. They've chosen a simpler spherical shape that gives a more poorly focused image, and then added three mirrors to compensate for the problem.

One mirror will do a job similar to that performed by the package of corrective optics being prepared for the defective Hubble Space Telescope. The really clever feature, though, is the final 3-meter mirror containing 141 segments that is a scaled-down version of the main reflector. By adjusting the segments corresponding to those in the big mirror, says Ardeberg, it should be possible to "cheat the telescope," correcting for any errors in the positioning of the segments in the main mirror, and producing a near-perfect image.

Experts in the field are impressed. "It's a very beautiful...and realistic proposal," says Ray Wilson, a former ESO optical designer who is now retired. Ardeberg reckons the cost of construction, at a site such as La Palma in the Canary Islands, to be about $110 million over 10 years—and he's optimistic that an international consortium will fund the project.

House Votes Big To Kill SSC

What is the next number in the sequence 87, -51, -130,...? Supporters of the Superconducting Super Collider (SSC) are worried that there won't be another number. Those figures are the margins in the annual House of Representatives votes on the SSC. And for SSC backers, they're headed the wrong way. Last week's 280: 150 vote to kill the $10 billion project is the second year in which the body has given it a thumbs down, and the largest margin by far. Now it's up to the Senate to save the embattled project.

Although the Senate traditionally has been a strong supporter of the SSC—a 2:1 majority last year was enough to convince conferees to restore $517 million for the current year—the size of the defeat in the House makes it more doubtful that advocates can pull off the same magic again. The president has requested $640 million for the fiscal year beginning on 1 October. Last week the House also voted to kill two other Energy Department projects, a space-based nuclear reactor and an advanced liquid metal reactor.