

Civin, a cancer expert and stem cell researcher with the new Institute for Cell Engineering (ICE) at Johns Hopkins University School of Medicine in Baltimore, says more research and new cell lines will be "great" for getting better treatments to patients faster. "Hopefully," he says with a touch of envy, "the U.S. would someday approve our use of them."

The center's first task will be to produce ES cells in bulk quantities from the 10 to 12 lines that researchers will bring to the consortium. It also hopes to generate 20 new ES and adult stem cell lines. Its most difficult challenge, however, will be to coax stem cells to develop into specific tissue types that could be used for therapies. Trownson says he hopes that the center can develop treatments for blood conditions such as leukemia that could go into clinical trial within 5 years and be available commercially a few years later, with help for solid-tissue disorders like Parkinson's to follow. Reagents for identifying stem cells will be ready "straight away," he adds.

Researchers also anticipate a collaboration with a primate research center, Maccine, at the Bogor Agricultural Institute in Indonesia. Trownson says he hopes to use animals at the primate center to test potential therapies involving blood, skin, cardiac muscle, lung, liver, and brain cells.

The government is preparing legislation to codify the April agreement, which appears to have resolved a heated public debate on the use of ES cells in research. Speaking 30 May at a press conference in Canberra, Prime Minister John Howard called the potential benefits from stem cell research "quite literally unlimited" but said that the work would be "guided by the community's ethical considerations." A raft of committees will be set up to oversee research in the field, and Trownson emphasized that "any procedures banned under these agreements will not be undertaken by the center."

The new center will also receive money from state governments and two companies, ES Cell International and BresaGen, created to commercialize work conducted at Monash and Adelaide universities, respectively. Trownson anticipates that a staff of 150 scientists will eventually work at the center, which will occupy its own building on campus. "Some very well-known U.S. scientists," he adds, have already expressed interest in coming aboard.

Stem cell researcher Ronald McKay of the U.S. National Institute of Neurological Disorders and Stroke doesn't think the new center will cause U.S. researchers to migrate to Australia. Nonetheless, he says that

it, combined with the work done in Singapore to derive the Monash cell lines, gives the South Pacific a substantial presence in stem cell research.

—LEIGH DAYTON

Leigh Dayton writes from Sydney.

SWITZERLAND

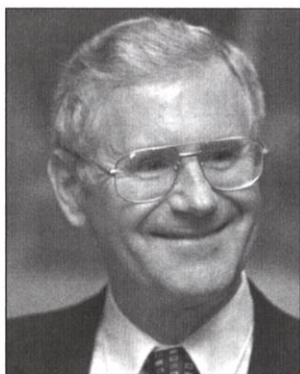
Report Aims to Rescue Science From Doldrums

BERN—A decade of stagnation has sent Swiss science into a downward spiral that only broad reforms and a massive infusion of funds can reverse. That, at least, is the diagnosis offered last week by the Swiss government's science advisory body. However, it's unclear whether leaders of the Swiss Federal Council, the government's executive branch, are prepared to prescribe strong medicine.

At a press conference here, officials of the Swiss Science and Technology Council (SSTC) followed up a warning shot they fired last fall by offering a laundry list of actions for remedying the country's most urgent woes. The proposals include unifying Switzerland's fragmented higher education system, installing a modern tenure-track system, shoring up support for long-term basic research, and increasing the science and technology budget by 10% a year from 2004 to 2007. The recommendations "make a lot of sense," says Patrick Aebischer, president of the Swiss Federal Institute of Technology in Lausanne.

The latest symptom of a research community in crisis, scientists say, is the Swiss drug giant Novartis's announcement last month that it would set up a \$250 million research facility in Cambridge, Massachusetts (*Science*, 17 May, p. 1216). "You have to give something back to industry to keep industry here," says Silvia Arber, a neurobiologist at the University of Basel's Biozentrum.

Part of the problem is money. Federal R&D budgets have remained essentially unchanged over the past decade: The \$1.7 billion in 2000, adjusted for inflation, is roughly the same amount spent in 1992. But there are deeper structural issues as well. For instance, most universities have few stable positions below the level of full professor. "It's an old-fashioned system," says Jürg Stöcklin, a population biologist at the University of Basel who has what he calls one of the "rare permanent positions in the Mittelbau": the limbo that re-



Savior? Gottfried Schatz is pressing for action.

ScienceScope

Coming Together on Cloning The world needs an international convention outlawing reproductive cloning, say scientists and policy-makers who met this week in Berlin to discuss global bioethics.

The meeting, organized by the French and German governments, attracted 70 participants from about 15 nations. Over 2 days, they sought consensus on a range of issues, including cloning, the commercial use of biotechnology, and developing world access to new technologies.

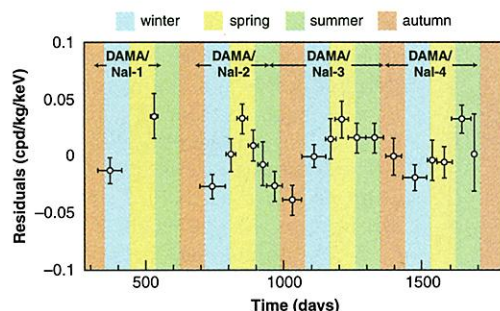
In a final communiqué issued 4 June, the group offered a laundry list of sometimes vague ideas, including a call for expanded bioethics education and training. But when it came to duplicating humans, participants were precise: They urged governments to forge a global agreement that would ban reproductive cloning and bar international trade in embryos. The more complex issue of therapeutic cloning should be discussed separately, they said.

German and French organizers say they will now take the ideas to the United Nations, which is expected to discuss the issues in September.

Full Speed Ahead A last-minute bid to strengthen ethical restrictions on embryo research failed to derail approval of the European Union's (E.U.'s) main research program. The E.U. council of ministers this week approved the 6th Framework research program without debate, giving little hint of a behind-the-scenes scramble to exclude certain types of embryo research from the \$17 billion, 4-year plan.

In late May, member countries Ireland, Germany, Austria, and Italy threatened to block the Framework if it lacked prohibitions on reproductive cloning, germ line modifications, and creation of embryos for research—restrictions that were spelled out last year in a European Commission declaration. After failing to win majority backing for the idea, however, the countries instead issued a joint statement expressing concern about the lack of ethical guidelines. They also vowed to revisit the issue in coming months, as E.U. officials draft rules for specific programs.





Blown away. Seasonal ups and downs in particle detections were not due to a dark-matter "wind," a new study shows.

Rita Bernabei of the University of Rome, a physicist with the DAMA collaboration, says differences in the two detectors make a direct comparison between the results misleading. But other researchers say EDELWEISS has all but put the matter to rest. "For the first time, you exclude this DAMA positive evidence for dark matter," says Michel Spiro, also at CEA Saclay. "I'd prefer that it was confirmed than excluded, but this is important physics."

Yorck Ramachers of Oxford University suspects that DAMA's seasonal variation is a systematic error. The cumulative effects of annual cycles of temperature, humidity, and other factors might explain the "detection," he says. In any case, he says, several other dark-matter searches are likely to release data this year, so those who were rooting for the DAMA result might soon have fresh puzzles to console them. —CHARLES SEIFE

INFECTIOUS DISEASE

Cholera Strengthened By Trip Through Gut

Poor sanitation promotes the spread of cholera, but that's not the only way humans foster the deadly diarrheal disease. Microbiologists have discovered that the human gut seems to prime the bacteria responsible. Before *Vibrio cholerae* exit the body in watery stools, something about the intestinal environment causes them to rev up the activity of certain genes. These genes, in turn, seem to prepare them for ever more effective colonization of their next victims, possibly fueling epidemics, says Andrew Camilli, a microbiologist at Tufts University School of Medicine in Boston.

"The hypothesis that passage through the host enhances infectivity is quite provocative," comments Matthew Waldor, a microbiologist at Tufts-New England Medical Center in Boston. Adds Vic DiRita, a microbiologist at

the University of Michigan, Ann Arbor: "It's really amazing. It may explain the rapid and explosive nature of these epidemics."

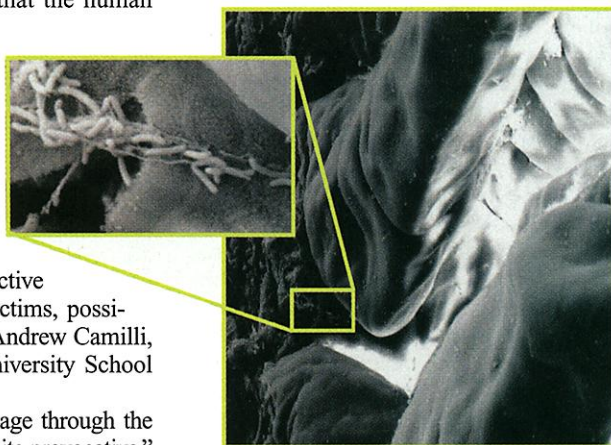
A thwarted experiment put Camilli and his colleagues on the trail of this so-called hyperinfectivity. He and others had long wondered why cholera epidemics become rampant as quickly as they do. Camilli thought the microbes residing in the human gut might develop defenses against the gut's acid environment. As a result, more of the excreted, acid-tolerant bacteria would survive in subsequent hosts. But when the researchers went to Dhaka, Bangladesh, to get fresh *Vibrio* to test this idea, technical difficulties foiled the experiment.

Instead, graduate students Susan Butler and D. Scott Merrell, who is now at Stanford University School of Medicine, made a peculiar observation. While in Bangladesh, they injected mice with a mixture of bacteria grown in the lab and isolated from human stools. The stool-derived bacteria greatly outcompeted the lab-derived bacteria, the researchers found, calculating that the former were up to 700 times more infectious than the latter.

This increased infectivity lasted at least 5 hours in bacteria living in pond water—long enough for someone to drink the infected water, says Camilli. However, the hyperinfectivity disappeared when the microbes were grown more than 18 hours in the lab, the team reports in the 6 June issue of *Nature*.

To understand what made excreted *Vibrio* different from their laboratory counterparts, Camilli and Stanford microbiologist Gary Schoolnik looked for changes in gene expression. They exposed a microarray made with pieces of *Vibrio*'s genes to *Vibrio* RNA isolated from fresh stools or lab strains. Some 3120 of the 3357 genes studied were equally active. But in the stool-derived sample, 44 genes were more active and 193 were less active.

When the researchers looked at the most logical suspects for increased infectivity,

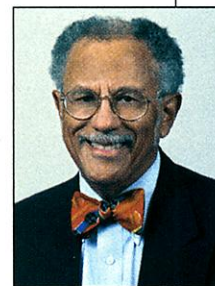


Pathogenic squatters. In this mouse small intestine, *Vibrio cholerae* bacteria (inset) have latched onto cells lining the gut.

ScienceScope

Prying Open the Board Federal legislators are urging the governing board of the National Science Foundation (NSF) to conduct more of its business in public—or else. The U.S. House of Representatives this week was expected to pass an NSF authorization bill that calls on the agency's in-house watchdog, the inspector general (IG), to ensure that the board is complying with all relevant federal statutes pertaining to open meetings.

The House vote follows a Senate hearing last month at which Senator Kit Bond (R-MO) told atmospheric scientist Warren Washington (right), newly installed as chair of the National Science Board, "to avoid the heartburn and take care of the matter before it becomes a problem." Washington replied that he was "philosophically" in favor of "doing as much business as possible in the open" but that he needed to check with NSF officials before giving a fuller answer. IG Tina Boesz says that her office has started to look into the matter in anticipation of a formal request from Congress.



Let the Race Begin This week, at a meeting in France, the partners in the \$4 billion International Thermonuclear Experimental Reactor (ITER) were to formally submit their candidate sites to host the mammoth fusion experiment. Japan, the favorite, last week announced its choice of Rokkasho, a village in Aomori Prefecture about 540 kilometers north of Tokyo that is already home to a controversial nuclear fuel reprocessing plant. The European Union was expected to offer two candidates: Vandellós, near Barcelona, the site of a shuttered nuclear plant; and Cadarache, near Aix-en-Provence, next to France's main nuclear power research facility. A private Canadian group is pushing a site in Clarington, near Toronto.

The winner, to be chosen by the end of the year, is supposed to be the best site within the country willing to pick up the largest share of the tab. Each potential host has a huge financial stake in the decision. The Aomori provincial government, for example, expects to reap some \$10 billion in economic benefits over the expected 30-year lifetime of the project.

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