restored some order to ESA's science program, the retrenchment was not popular. "We have lost a whole cornerstone mission, namely, the Mercury mission," says SSAC chair Lodewijk Woltjer, president of the International Astronomical Union. "We had to shift that out of the first decade [of the next century], we have no idea to when—this is a significant loss," he says.

The next scope. Even with the Mercury project out of the picture, ESA's science budget will be insufficient to keep all of the approved missions after 2000—Integral, Rosetta, FIRST, and Planck—on their original schedules. Europe's participation in two other international programs could also be compromised: "We will have problems with effective participation in the [NGST], and of course the Mars program, in which one would wish to invest substantially," says Woltjer.

The threat to participation in the NGST, the successor to the highly successful Hubble Space Telescope, is particularly worrisome to European astronomers. "If European astronomy does not become involved in the NGST, it will be a serious blow. ... It would be a disaster," says astronomer George Miley of Leiden University. The NGST would form an important part of NASA's proposed "Origins" program, which researchers hope will win presidential backing in the near future. The NGST will have a much larger mirror than Hubble, up to 8 meters compared to 2.4, and will allow astronomers to see objects three magnitudes fainter than Hubble's limit. "It will be a very powerful instrument for cosmology," says Rowan-Robinson.

"If this project is feasible, and if NASA decides to put the required money into it, then certainly European astronomers would wish to have significant participation," says Woltjer. Miley believes that ESA should even be prepared to sacrifice FIRST to allow participation with NGST: "I don't think that access to FIRST will be nearly as important for European astronomy as the NGST."

During last week's meeting, SSAC members decided to set up a small group of specialists to follow NGST development. Cavallo warns that any substantial request for funds must be made soon. "NGST is not yet part of our program, and would have to run against other competitors," he says, and in any event, all available funds are committed until 2012.

For the time being, Europe's space scientists are waiting anxiously for the politics to unfold. After the fate of the Cluster mission is determined next month, SSAC will ponder timetables again in April, and its recommendations will go back to the next SPC meeting in June. At that point, a clearer, if more distant, horizon should emerge.

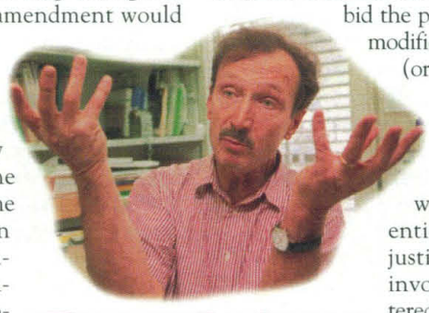
–Alexander Hellemans

Alexander Hellemans is a writer in Paris.

SWITZERLAND

Biologists Mobilize Against Anti-Genetics Referendum

In about a year, the people of Switzerland will vote on a constitutional amendment that, if approved, would give the country one of the world's most hostile environments for research involving transgenic animals. The proposed amendment would ban basic research involving the genetic manipulation of animals and would forbid the release of any genetically altered organism into the environment. While some work would be allowed on plants and microorganisms under strictly controlled conditions, opponents say the jobs of at least 1500 scientists and technicians would be threatened. Prominent scientists and drug companies warn that research would have to move abroad if the amendment is passed. "The negative impact on research here would be enormous," says Nobel laureate Rolf Zinkernagel, director of the University of Zurich's Institute of Immunology, whose own research would be affected.



PETER LAUTH/AP PHOTO

"The negative impact on research here would be enormous."
—Rolf Zinkernagel

A coalition of Swiss environmental, animal-rights, and political groups first proposed the Gen-Schutz (gene protection) initiative in 1993 and gathered 111,063 signatures calling for a nationwide binding vote—well over the number required by law to force the government to call a referendum. The vote will probably take place by early next year, and some surveys indicate that the proposal enjoys wide support. It would become part of the constitution if it wins a nationwide majority and is approved by more than half of the 26 Swiss cantons, or states.

Initially, scientists were slow to react. But the issue took on more prominence when Zinkernagel was named a joint recipient of the Nobel Prize in physiology or medicine last October, and proponents of the Gen-Schutz initiative made him a lightning rod for criticism of gene-transfer research. One animal rights group even alleged in newspaper advertisements that Swiss business leaders had influenced the Nobel committee in favor of Zinkernagel as a way of countering the initiative. Zinkernagel chose to ignore the ads to avoid drawing attention to them, but he says the attacks strengthened his resolve and that of others to speak out against the initiative. "We scientists must go out and explain to the people, in simple terms, what this is all about," Zinkernagel says.

The initiative would ban the production, use, and distribution of transgenic animals; forbid the patenting of genetically modified plants and animals (or parts thereof); and ban the deliberate release of genetically modified organisms into the environment. It would also require scientists to provide detailed justification of research involving genetically altered plants and organisms. Sponsors and supporters include 19 animal-protection groups; 19 political groups, mostly from the Green and Social Democratic parties; and nine environmental groups, including the Swiss branches of Greenpeace and the World Wildlife Fund; as well as agricultural, religious, medical, consumer, nutrition, and developmental-aid groups.

Exaggerated impact? The initiative's supporters—including a few scientists—contend that some Swiss researchers and pharmaceutical companies are talking up the potential effects of the Gen-Schutz initiative to try to scare the public. Daniel Ammann, a leader of the Swiss Gene-Technology Working Group (SAG)—the initiative's main sponsor—says that the amendment was carefully worded so that it would not damage Swiss medical research. Ammann says it would permit some use of gene technology and gene therapy for human medical research, as long as transgenic animals are not involved. He adds that this could include using genetically altered plants in a controlled laboratory environment, as well as industrial production of medicines through the use of genetically altered organisms other than animals.

Hans Scholer, a retired professor of microbiology at the University of Basel, says "The core of the initiative is sound, although a compromise is also possible." He told *Science*: "There's a lot of propaganda, much of it paid for by big companies, trying to scare people to vote against this initiative." But Scholer concedes that he is in the minority—no major scientific group backs the initiative.

Indeed, most researchers say the outright ban on research using transgenic animals would be devastating. "If this initiative were to become law, I would have to stop my research in Switzerland," warns Denis Duboule, a professor of embryology at the University of Geneva who uses genetically altered mice to mimic human syndromes. Charles Weissmann, a prominent researcher at the University of Zurich's Institute for Molecular Biology, says he "would be forced to shut down my operation and seek refuge elsewhere with my transgenic mice." And Bernard Mach, head of the University of Geneva's Department of Genetics and Microbiology, says he and other Geneva university officials have discussed "transferring all of our transgenic research across the border to France" if the initiative is approved.

Opposition mobilizes. While they may have gotten off to a slow start, many Swiss scientists believe that they can convince voters to reject the initiative. They already have some key political support: The Swiss parliament and Interior Minister Ruth Dreifuss, who is responsible for science, have expressed opposition to the measure. "The quest for knowledge should not be allowed to be stopped by general prohibitions," Dreifuss said recently at the Swiss Federal Institute of Technology.

A meeting of key researchers is planned for this spring in Geneva to discuss the issues and develop a strategy. And Switzerland's powerful pharmaceutical industry—led by giants Hoffmann-La Roche and Novartis (formed last year by the merger of Sandoz and Ciba-Geigy)—is committed to using its resources to help defeat the initiative. "So far, the scientists' campaign has been low-key," says Mach. "But we take this very seriously. The supporters of the initiative have a big budget, and they use simplified slogans and advertisements. We, too, may have to turn to the help of professionals."

"We are trying very hard to communicate with the general public," says Richard Braun, a microbiology professor at Bern University who also chairs the Gen Suisse foundation in Bern, which aims "to promote public understanding of biotechnology" with the support of big pharmaceutical companies. Braun says he is confident that Swiss voters will eventually come down on the side of science. Although Switzerland already has some of the world's strictest laws governing the use of laboratory animals, the nation's voters in 1993 rejected an initiative—by a 72% to 28% margin—that would have banned the use of animals for research. A previous animal-rights initiative was also rejected.

One factor working in favor of the scientists is the number of jobs that depend on the pharmaceutical industry, which employs tens of thousands of Swiss workers in the area around Basel. "Major parts of biotechnological research in industry would have to be relocated to other countries," says Thomas B. Cueni, secretary-general of Interpharma, the Swiss pharmaceutical industry association. Cueni says about 2200 pharmaceutical-industry scientists are involved in basic research in Switzerland.

The threat to academic jobs is also sparking an organized response. Peter Mani, chief of biosafety at the Swiss Institute of Virology and Immunoprophylaxis near Bern, is coordinating an effort by researchers at Swiss universities to help defeat the initiative, which is supported by the Union of Swiss Organizations for Experimental Biology, the Swiss Society of Microbiology, and the Swiss Academy of Medical Science. He says a preliminary survey found that about 880 scientists, 350 postgraduate students, and 230 technicians would have to find other work if the use of transgenic animals is forbidden.

Mach says that next year, Swiss voters should remember the Austrian monk, Gregor Mendel, whose 19th century experiments with cross-pollination formed the basis for the science of genetics. "After all, Mendel released what you might call genetically modified organisms into the environment," Mach says. "Today, some people in Switzerland might want to throw him in jail for that."

–Robert Koenig

Robert Koenig is a writer in Berlin.

RESEARCH FUNDING

Senate Bills Back Huge Increases

Barely a month ago, research lobbyists began pushing for a 6.5% increase next year in the $12.75 billion budget of the National Institutes of Health (NIH). They assumed that was as much as they could expect from a penny-pinching Congress intent on curbing federal spending. And their recommendation that the National Science Foundation's (NSF's) $3.27 billion budget be increased by 7.1% seemed so unrealistic as to trigger speculation about what its advocates had been imbibing. Maybe someone should have checked the water fountain in the Senate anteroom instead.

Last week, Senate Republicans were falling all over themselves with promises to do more for basic research than the lobbyists had dreamed possible. One day after the swearing-in of President Clinton, Senator Connie Mack (R–FL) introduced a resolution to double the NIH budget over 5 years, and Senator Phil Gramm (R–TX) proposed a bill calling for a doubling over 10 years of the research budgets of a dozen federal agencies and programs. Speaking in support of Mack's resolution, Senator Arlen Specter (R–PA), chair of the panel that controls NIH's purse strings, pledged to fight for a 7.5% increase—a boost of nearly a billion dollars—in NIH's 1998 budget.

The gush of kind words for basic research is, so far, exactly that—kind words. "I'm not counting the money yet, that's for sure," says one NSF official. Even if adopted, the proposals from Mack (S.R. 15) and Gramm (S. 124) are authorization measures that would allow Congress to spend more—but do not force it to spend an extra penny. Binding spending decisions will come later this year, as appropriations panels like the one headed by Specter do their work.

Still, the fact that legislators are even discussing big increases at a time when most agencies are looking at flat or shrinking budgets warms the hearts of research advocates. "I think [members of Congress] see it as a win-win proposition, as a way of doing something that the public wants," says John Suttie, a biochemist at the University of Wisconsin and president of the Federation of American Societies for Experimental Biology (FASEB).

The first concrete indication of the depth of this newfound love for science on Capitol Hill will come this spring, when Congress adopts a budget resolution that will guide the work of the spending panels. Aides to Mack and Gramm say they will try to beef up the relevant research accounts in that resolution. Any increases for science, however, will require cuts in other programs—something on which the Mack and Gramm measures are silent.

One legislator who has spelled out tradeoffs for science is Representative George Brown (D–CA), the veteran ranking member on the House Science Committee. Brown's plan, reissued last week after its first appearance last fall, would boost R&D spending by 5% a year by cutting various entitlement programs and postponing any tax cuts. But it stands little chance of passage in a body controlled by the other party.

In the meantime, organizations like FASEB are rethinking their earlier lobbying goals in light of the new spending figures now being bandied about. Suttie says it's "too early" to discuss precise numbers, but something more than NIH's own target of a 9% increase seems likely. In the meantime, he says, "you take what you can get—and this is a great place to start."

–Jeffrey Mervis