SOUTHERN EUROPE

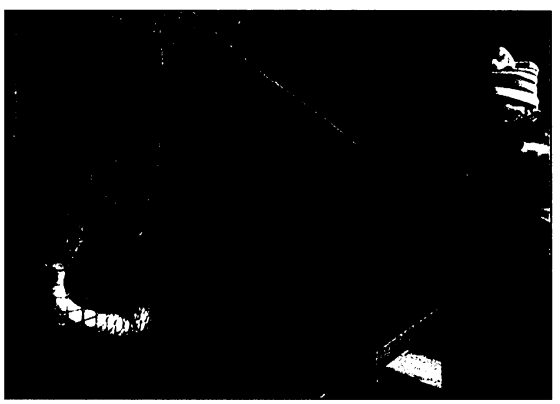
European Union to Fund Science in Balkan Region

VIENNA—Scientists in the war-torn Balkans may soon get a helping hand from the European Union (E.U.). The European Commission (EC) plans to launch a "Balkan Reintegration" program in 2001 to fund collaborations between E.U. scientists and colleagues in Albania and three former Yugoslavian countries: Bosnia-Herzegovina, Croatia, and Macedonia. Although "the Balkan region is high on the political agenda," says the EC's Peter Härtwich, Western efforts to support research there have been "almost nonexistent" until now.

The EC intends to issue a call for proposals next March that would include scientists from at least two target countries and two E.U. member states. Likely themes are environmental degradation and public health issues linked to war and refugee migration. The EC plans to release a modest 4.3 million euros ($3.8 million) for the new program.

Speaking here at the first meeting on how the E.U. might support Balkan research, scientists from Croatia and Bosnia quickly found common ground on one theme: pollution in the Danube watershed. Yugoslavia may be able to join, too, if, as EC officials expect, the new democracy is cleared to participate in such E.U. programs in time for next spring's call.

But even in these struggling nations, $4 million doesn't go far. "Opening the new Framework program is not enough," argues meeting organizer Manfred Horvat, director of Austria's Bureau for International Research and Technology Cooperation. Erhard Busek, a former Austrian science minister, urged Balkan scientists to try prying loose some research dollars from the Southeast European Cooperative Initiative (SECI), which doles out money in the Balkans for projects such as beefing up border stations, power grids, and securities markets. Busek, who coordinates SECI, suggested that the scientists put together a slate of projects and present them at SECI's next meeting in March.



Troubled waters. Fish-killing pollution on the Danube could be one Balkan project.

Scientists from the Balkans region may also be able to compete for funds from the E.U.'s next 5-year research program, Framework 6, which begins in 2003. EC officials have privately encouraged Horvat to compile a wish list of initiatives that could benefit the former Yugoslav countries and Albania in the next Framework. One possibility might be a program to help these countries, which have suffered massive brain drains, recoup scientific talent. "We should fight for return scholarships," says Raoul Kneucker, director-general of Austria's Ministry of Education, Science, and Culture.

Horvat planned to deliver the document to Brussels before Christmas, so it could be considered for the Framework 6 proposal that is expected to go to the European Parliament in March. –**RICHARD STONE**

ECOLOGY

Silk Moth Deaths Show Perils of Biocontrol

North America's largest, most spectacular moths are being decimated by a foreign fly introduced to control gypsy moths, a new study suggests. These cecropia moths and other native silk moths were once so common that people gathered cocoons by the basketful, but lately entomologists have been hard-pressed to find them. Now, a series of field experiments has shown that the European fly *Compsilura concinnata* has a ferocious appetite for silk moth caterpillars.

The work, published in this month's issue of *Conservation Biology*, not only may help solve the mystery of the silk moths' decline, but it also underscores a growing concern among ecologists: that biocontrol agents can have unintended side effects, attacking species outside their intended range of hosts. "It's an important paper," says ecologist Donald Strong of the University of California, Davis. The study, led by wildlife biologist George Boettner of the University of Massachusetts, Amherst, "gives the clearest evidence so far" that biocontrol insects are harming native insects, says Strong, who recently advocated stricter rules for biocontrol (*Science*, 8 December, p. 1896, and 16 June, p. 1969).

Government and university scientists began introducing *Compsilura* flies in 1906 to control forest-devouring gypsy moths and browntail moths. They continued to release the fly in 30 states until 1986. But, says Boettner, the fly doesn't just kill these imported moths; it attacks at least 180 species of insects. As early as 1919, scientists noted that one silk moth, the promethea moth, was becoming rare in the areas where the fly had been loosed.

Collateral damage. Cecropia moths are falling victim to a fly meant to control other moth species.

The fly's spread has also coincided with the decline of cecropia (*Hyalophora cecropia*), North America's largest moth, with a wingspan of up to 15 centimeters. It dwells in eastern and central forests along with other members of the silk moth family. At the turn of the 19th century, silk moths were so common that people reportedly gathered cocoons just to watch them hatch in the parlor. Now the moths are scarce, and at least four species are listed by the state of Massachusetts as imperiled. Scientists have blamed both the pesticide DDT and habitat loss, but neither fully explains the silk moths' disappearance.

To find out whether *Compsilura* could be a culprit, Boettner and his colleagues raised cecropia moth caterpillars and placed 300 of them (five per tree) in several spots in the Cadwell Memorial Forest in Massachusetts. After a week, the caterpillars were recaptured and reared in the lab. But, rather than turning into moths, 81% of the caterpillars became dead larvae bursting with *Compsilura* maggots. In another series of experiments, the team set out promethea moth caterpillars at densities varying from 1 to 100 per tree. Flies killed between 52% and 100% of the caterpillars.

"When you see that kind of mortality, it's a wake-up call," says Boettner, who coauthored the study along with his wife, U.S. Fish and Wildlife Service biologist Cynthia Boettner, and U. Mass entomologist Joseph Elkinton. Elkinton says that although the study isn't absolute proof, "there's a fairly strong likelihood that *Compsilura* is the reason for the [silk moth] decline."

The study is one of the first "that uses experimental techniques to figure out, in hindsight," that unintended consequences can occur during a biological control campaign, says Francis Howarth, an entomologist at the Bernice P. Bishop Museum in Honolulu, Hawaii. That issue is of growing concern to many scientists, even those such as Elkinton who strongly support biological control. Right now, he says, the regulations governing the release of insects intended to control other

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insects are much looser than those for insects meant to attack plant pests; the latter require data on the host range of candidate species.

But Robert Pemberton, a U.S. Department of Agriculture research entomologist in Fort Lauderdale, Florida, says the tide is beginning to shift. Biocontrol policies are now being talked about, he says: "We're having a lot of meetings between the biological control community and ecologists."

–MARI N. JENSEN

Mari N. Jensen is a science writer in Tucson, Arizona.

MICROBIOLOGY

Fighting Bacterial Fire With Bacterial Fire

Smearing bacteria on open sores seems like the worst approach to preventing infection. But work presented last week at the annual meeting of the American Society for Cell Biology in San Francisco suggests that applying a harmless bacterium or its products to surgical wounds may thwart infections by the dangerous pathogen *Staphylococcus aureus*, a major cause of hospital-acquired infections and one that grows more threatening as the incidence of antibiotic resistance rises.

Although physicians have previously pitted one bacterium against another to prevent infections of the intestinal and genitourinary tracts—say, eating yogurt with live cultures to combat diarrhea—this is the first attempt to use a friendly microbe to prevent infection of surgical wounds, say experts. "The idea is certainly unique and probably feasible," says microbiologist William Costerton of Montana State University in Bozeman.

The bacterium, known as *Lactobacillus fermentum*, seems to exert at least part of its protective effects by secreting a protein that prevents *S. aureus* from binding to its target cells, reported Jeffrey Howard, Gregor Reid, and colleagues at the University of Western Ontario in London, Ontario. If so, says Richard Novick, a microbiologist at New York University School of Medicine, researchers will have to reevaluate their thinking about how such bacterial interference works. Conventional wisdom attributes the infection-fighting effects to bacteria-killing toxins, says Novick. But "here's a beautiful example of bacterial interference that's caused by a substance that probably blocks colonization or adherence by the other bacteria."

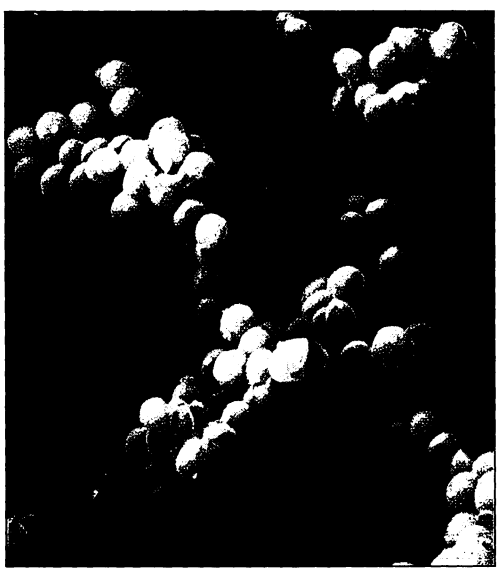
The current work extends previous experiments in which Reid and his colleagues showed that substances secreted by *Lactobacillus* inhibit the binding of *S. aureus* to synthetic surfaces such as polystyrene. Perhaps, the researchers reasoned, *Lactobacillus* or the material it secretes could also keep *S. aureus* from setting up shop in animal tissues.

To test this idea, they placed small pieces of silicone under the skin of rats to mimic a surgical implant and then added *S. aureus*. As expected, serious infections emerged at the wound sites within 3 days. But adding live *Lactobacillus* during the surgery protected the animals. None of the nine rats that received the largest doses of the beneficial bacteria developed infections, compared with five of nine controls. The secreted material worked, too. It reduced the incidence of infection by approximately 90% compared to controls.

The researchers next tried to nail down the molecules responsible for the beneficial effects by analyzing the mixture *Lactobacillus* discharges. One active component turned out to be a protein that Reid had previously found blocks microbial adherence to polystyrene. Follow-up experiments established that this protein alone hampers the ability of *S. aureus* to cause wound infections in rats.

The protein may work by outcompeting *S. aureus* for the pathogen's binding sites in tissue. *S. aureus* gains a foothold in the body by grabbing a protein called collagen, and the *Lactobacillus* protein also binds this host protein. Although the researchers have not yet established that its protective effects are due to this binding, others in the field are excited that the team is homing in on the molecular details of bacterial interference. "It's the first instance that I know of where modern biochemistry and genetics has been used to study bacterial interference," says Costerton.

He suggests that bacterial interference may have advantages over conventional antibiotics, which wipe out good



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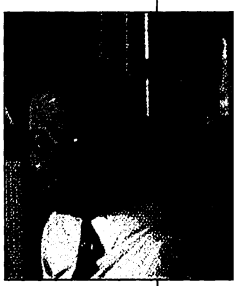
No way in? Infections by *S. aureus* bacteria like these may be prevented by blocking their attachment to host cells with a *Lactobacillus* product.

ScienceScope

Going Home After 2 years at the helm of U.S. science policy, White House science adviser Neal Lane, 62, will head back to academe when the Clinton Administration ends next month. The physicist said last week that he will return to Rice University in Houston, Texas, as its first ever professor without portfolio, able to teach in any department. Lane was Rice's provost in 1993 when recruited to head the National Science Foundation. He moved to the White House in 1998, where he cemented a reputation as a genial politico who preferred to work outside the spotlight.



Top Quark After more than two rudderless years, France's National Institute of Nuclear and Particle Physics (IN2P3) finally has a new captain. On 15 December, the French government named Jean-Jacques Aubert, the institute's scientific director, as head. The IN2P3 had been without a chief since October 1998, when former chief Claude Detraz went to the CERN physics center near Geneva.

Aubert, a physicist from Marseilles, came to national attention 2 years ago when he wrote a report for former research minister Claude Allègre proposing that the IN2P3 merge with the French Atomic Energy Commission's institute for nuclear and particle physics, called DAPNIA (*Science*, 23 April 1999, p. 569). But this controversial idea—which many physicists feared would make the IN2P3 subservient to the commission's research priorities—now appears dead in the water, sources tell *Science*. In fact, some researchers doubt that Aubert's appointment will make much of a difference at all to the chronically underfunded IN2P3. Says one physicist, who asked to remain anonymous: "It just means business as usual."

Genome Gift A record-breaking grant aims to put Indiana University (IU) on the genomics map. The Lilly Endowment of Indianapolis last week announced a $105 million gift to jump-start the Indiana Genomics Initiative, which will focus on genomics, bioinformatics, and bioethics. The grant—the largest ever given by the charity and the richest ever won by IU—will help the school add 75 investigators over the next 3 years. The cash will help "attract a stellar array of intellectual talent," predicts Lilly president N. Clay Robbins.

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