are now responding "enthusiastically" to the coming of conservation biology, says Temple. Their reasoning may involve self-interest: The field has proven capable of drawing in new—if small—sources of funding. For example, the Pew Charitable Trusts has a 1992 budget of $15.5 million to spend on research to preserve biological diversity, including an initiative that helps set up university programs to train students in "conservation and sustainable development." Likewise, the MacArthur Foundation is spending $17 million this year on conservation of biological diversity, and the NSF has a fund of $2.4 million that is part of its special "competition" in Conservation Biology and Restoration Ecology. "We're trying to stimulate the fearless biologist—one who is solidly rooted in ecology or systematics, for example, but who has no compunction whatsoever about running off to find a computer scientist or a molecular biologist to learn a new technique," says W. Franklin Harris, budget and operations officer for the NSF's directorate for biological, behavioral, and social sciences.

The supply of research dollars isn't the only thing that's pushing the new discipline forward. Demand—from students—is also playing a part. Students are filling conservation biology classes and clamoring for them if they don't exist. "Every day, there's something in the paper that emphasizes the importance of the environment, and the problems we're having," says John Payne, a graduate student in the conservation biology program at the University of Florida. "Conservation biology will only become more important. I don't think it's a fad at all."

But despite the burgeoning funding for conservation biology and the demand from students for more classes in the field, the real test of the vision Michael Soulé elaborated in 1978 is yet to come. That test is not whether conservation biology can convince its academic critics that it is "real science," or improve its diplomatic relations with traditional conservationists, or generate funding from federal and private sources. The true test will be whether the field can actually preserve biodiversity. And even insiders are realistic on this point: "Now that we've had a decade of fairly intense activity, we have to ask ourselves, How has this affected the treatment of these [real-world, conservation] problems?" says Florida State University's Simberloff. "Our record is a bit disappointing." Nonetheless, its adherents are hardly giving up. Armed with their interdisciplinary collaborations and their high-tech tools, they think they're in on the beginning of something special. Which is why Simberloff insists that "the promise of the field is yet to come." ■ ANN GIBBONS

Soviet Environment Slips Down the Agenda

Environmentalism is strong in the new republics, but most people are more worried about sausages than pollution

Moscow—THE COLLAPSE OF SOVIET COMmunism, which was finally played out with the dissolution of the former Soviet Union last month, has had a curious and largely unnoted impact on the Russian environmental movement. During the dark days of Soviet power, the movement provided political cover for all kinds of protests against the regime, and it became a powerful force in its own right. Ironically, now that the regime has collapsed and the former dissidents are in power, the movement "has lost some of its political edge. "Environmentalism," says Loren Graham, a historian of science at MIT, "has lost a little bit of its cachet."

It's also lost the central bureaucracy that in the final days of the Soviet Union was beginning to take stock of the huge environmental problems facing the republics. The Soviet Ministry of the Environment, for example, put together an ambitious cleanup plan for reducing pollution—with an estimated price tag of $140 billion. But the ministry was recently disbanded—only to be resurrected without any clear source of funding. As the old instruments of Soviet power are swept aside, the question is: What is going to be done to protect and repair the environment there?

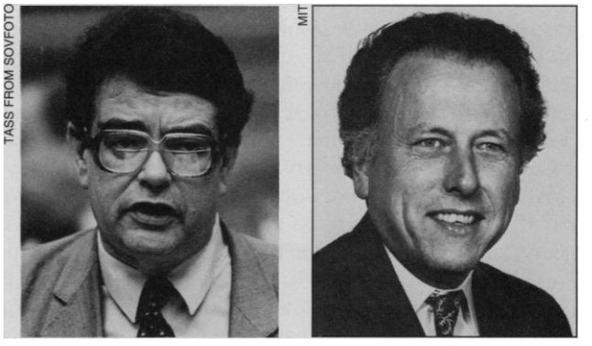
Clearly, it's going to take a while for the answer to emerge. One reason is that at the moment, most people are more concerned about where to find sausages than they are about levels of sulfur dioxide in the air. Says Douglas Weiner, a historian at the University of Arizona and an expert on Soviet ecology, "Even though people are concerned about the quality of the environment, the protests against environmental degradation will be muted. People will try to give (economic) reform a chance."

Getting enough food may rank higher than restoring the environment for the moment, but in the long term, the problems facing the nascent independent republics will have to be dealt with. What used to be called the Soviet Union is home to some of the most pristine regions in the world—and to some of the worst environmental disasters known to man. Take the following examples, which are only the tip of the iceberg of environmental degradation:

■ The explosion at Chernobyl in 1986 may have been the most notorious nuclear accident, exposing thousands to high levels of radiation, but it was just one in a string of power plant mishaps. Recently declassified information from the Soviet government describes 10 accidents at nuclear power stations from 1964 to 1985, including spilled radioactive water, a partial meltdown, and a fire in a turbine room.

■ Farm irrigation from rivers feeding the Aral Sea in South Central Asia in the last 30 years has reduced the sea's area by 40%, and its volume by 66%, destroying fishing and leading to sandstorms of salt and chemical fertilizers.

■ The so-called Green Book, or "Report on the State of the Environment in the USSR," published by the Ministry of the Environment, reports that as of 1988, 16% of the Soviet population lived in the 68 most polluted cities, including Alma Ata, Odessa, Novosibirsk, and Perm, where air pollutants exceed government-set limits.



Conference call. *Environment Minister Nikolai Vorontsov* (left), *MIT's Loren Graham.*

Environmentalism may have lost some of its political edge and immediacy now that the reformers are in power and grappling with economic crises, but does it still have popular support? Gauging how deep environmental sentiment still runs was one goal of a conference held in Moscow recently as part of an ongoing exchange between U.S.

scientists and officials and their Russian counterparts, titled "The Social, Political, and Cultural Dimensions of the Environmental Crisis in the U.S. and USSR."

Conference attendee Weiner notes that in the 1980s, "pollution became a lightning rod, galvanizing people against the bureaucracy." In Leningrad, an environmental group called Delta protested—and managed to hold up—construction of a dam that was planned across the Gulf of Finland. The rise of the timber industry and pulp mills on the shores of Siberia's once-pristine Lake Baikal has drawn protests from well-known political activists such as Valentin Rasputin and Andrei Sakharov. But the strength of the environmental movement in the 1980s was somewhat deceptive, because "when no other kind of political movement was possible, the environmental movement got going," according to Graham, who organized the Moscow conference.

Now that the political opposition can be carried out in the light of day, there is an apparent ambivalence about environmentalism that was evident in comments from some Russian participants in the conference—even those whose expertise is in biology. "Today, it's only a lazy man who doesn't swear to ecological values," says fisheries specialist L.A. Popov. But, he adds, "in a poor country, to (put forth) propaganda about reduced consumption doesn't make sense. The ecological approach should not turn into ecological extremism."

What seems to be needed in the collection of states that were once the Soviet Union is a bit of the pragmatism that now characterizes the environmental movement in Europe and the United States. But that attitude, says Graham, is missing. "Americans tend to be more practical and realistic" about balancing developmental and environmental issues, he says. "The Soviets haven't reached that stage yet. They don't know what a compromise is."

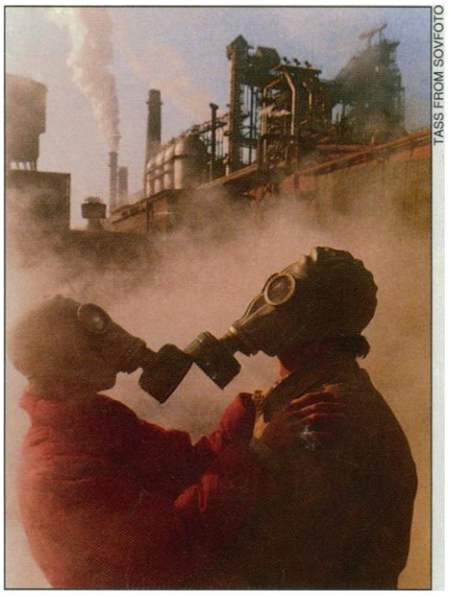
And the newly freed press isn't helping scientists or the population arrive at compromise solutions. Anton Struchkov, a senior researcher at the Institute of the History of Science and Technology, notes that there is currently little environmental writing in Soviet journals. He cites a survey of ecological topics that his institute conducted last year among the new, nongovernment periodicals. It found two political camps battling. On the left, writers raise the issue of environmental problems only for the purpose of condemning communism—equating pollution with the failed economic system. The conservative camp, on the other hand, promotes a return to monarchy, insisting that Western-style industrialization will lead to further pollution. The survey found that there is little environmental writing without a rigid political agenda. If an environmental movement means scientific journals dedicated to the subject, correspondence among scientists, and abundant literature on the topic, then, Struchkov concludes: "There is no field of environmental ethics in the Soviet Union."

Even information about environmental laws can be hard to find, as a new group called the Union of Scientists is finding out. Nikolai Krementsov, a historian of science with the St. Petersburg branch of the Institute of the History of Science and Technology, co-chaired a meeting of his branch of the institute in October, in which members wrote letters to government committees in search of information about environmental laws. But that's not the only problem that Krementsov and his group face: He complains that in the current tough economy, support from scientists is also getting harder to find. Even "our intelligentsia thinks more about food than about the environment," says Krementsov.

Still, the pressures exerted by the environmental movement have led to change. Environmental Minister Nikolai Vorontsov, the first noncommunist minister in the USSR when he was appointed 3 years ago, has spent the past couple of years producing environmental studies of the cities. And, if he is still in office, he plans to present proposals for regulations and cleanup at the United Nations environmental conference in Rio de Janeiro next year. But further progress is uncertain at best. His plan will require some 4.4 trillion rubles for installing pollution-control equipment and the ensuing cleanup. And now he has no funding or authority to enforce or administer the plan among the separate states. "We prepared (the plan) in the period of centralized economics," he says. "What will happen now is not yet known."

Yet the prognosis is not altogether gloomy for the environment in the former Soviet Union, even at the moment. One theme that draws support from all sectors of the political spectrum is the longstanding tradition of forest preserves, dating to the 11th century, which has been maintained to current times. These pristine areas—whose modern form dates to 1911—are closed to everyone but scientists, who use them to study everything from the adaptations of hoofed mammals to the snow to animal epidemics. They have also helped to restore devastated populations of sable, beaver, and antelope.

Vorontsov argues that the 8% of the Soviet land—nearly 180 million hectares—still untouched is a key natural resource for the world, as important as the more often cited



TASS FROM SOVFOTO

Smoke gets in your eyes. *Outside a steel-and-iron works near the town of Cheveporek in the Yaroslavl region of Russia.*

Brazilian rain forest. "It is very important to protect (this land)," he says. "It is important for the whole biosphere." In the past 2 years, he has increased the area of the preserves by 20% to more than 26 million hectares. But Vorontsov is not sure whether these newly preserved regions will survive as the country negotiates new political relations among autonomous republics. He's particularly worried about the temptation to exploit the natural resources as republics seek new sources of income.

This tradeoff between economic growth and environmental protection remains one of the central questions for the nascent Russian environmental movement. But the two goals shouldn't necessarily be thought of as implacably opposed. Indeed, some of the scientists at the fall conference in Moscow expressed hope that a better environment will be made possible by a healthier economy. "Rich countries are relatively clean," notes Aleksandr D. Bazykin, the deputy minister of nature protection, "while poor countries are dirty." And while the economy continues to expand, he sees an important role for researchers. "The duty of the scientificcommunity," he says, "is to formulate and disseminate the alternatives, not only among the decision makers, but among the public at large." Whether the scientific community will be able to carry out such elevated tasks when its main daily preoccupation is hunting for bread remains to be seen. ■ RICHARD BRANDT

Richard Brandt is a writer for Business Week *who is currently on leave as a Knight Fellow at MIT.*