Science Après Le Déluge: Struggling to Stay Afloat

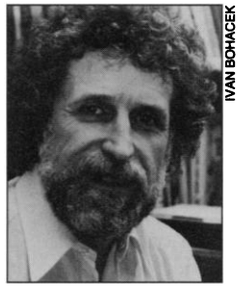
"We are still under water, but it is no longer 2000 meters deep above our heads; now, it is only 50 meters deep." That wry assessment of the state of Central European research comes from Domokos Kosary, the 79-year-old president of the Hungarian Academy of Sciences. Kosary, a historian who in his lifetime has seen the country governed by monarchists, nationalists, fascists, communists, and now capitalists, adds that, although the water is deep enough to drown in, Central Europeans at long last have hopes of reaching the surface.

Ask a researcher in, say, Prague what the situation for science will look like early next century, however, and you will draw a long, uncomprehending silence. Indeed, most Central European researchers are too preoccupied with not drowning to think about what they will do if they survive. They are currently trying to cope with declining research budgets and a massive brain drain. And they are in the midst of wrenching reforms of the research system aimed at determining which researchers should be supported and freeing science from an unproductive mindset that can make it hard to do good research. Painful as they are, these reforms will ultimately determine whether science in Central Europe will get its head above water, according to dozens of researchers and government officials interviewed by *Science* during a 2-week visit to the region last month.

That is, if research can survive the funding crisis. With the exception of eastern Germany, research budgets have been cut by 15% to 50%, and that trend seems likely to continue. It is not that governments in the region don't appreciate the need for a strong scientific infrastructure. "The government here is emphatically not antiscience," Jan Pisut, education minister in Slovakia and a theoretical physicist, told *Science*. "But it is our priority to do something about the economy first."

Researchers were initially hoping that assistance from the West would help keep them afloat. In the euphoria following Czechoslovakia's Velvet Revolution in 1989, says computer scientist Ivan Havel, brother of Czechoslovakia's President Vaclav Havel and a professor at Charles University in Prague, "people came from the West to embrace us and say, 'Welcome to the democratic world.' We expected lots of help after that." But the amount that has come has turned out to be "negligible," he says.

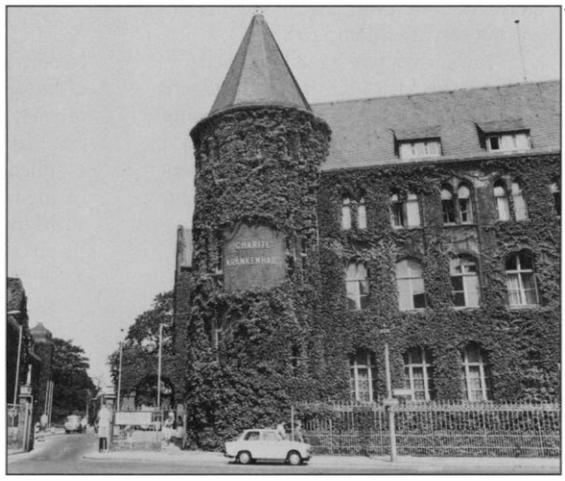
The amount of money flowing into the region from the West is comparable to "pouring water on dry sand," says Lawrence Cohen, science attaché at the U.S. Embassy in Budapest. Cohen helps to administer a joint U.S.-Hungarian grant program with a $2 million annual budget, half from each side. The program covers little more than travel costs for scientists visiting each other. Nevertheless, even small amounts can work wonders, says Cohen. "A dollar here goes many times further than in the United States. Distributed wisely, a little money could have a tremendous impact." But distributing money wisely is not nearly enough: As foreign aid experts have found in the developing world, spending money often simply creates the demand for more.



IVAN BOHACEK

Ivan Havel

Tamas Horvath, who administers one of the biggest assistance programs relating to research—the $100 million "Catching Up With Europe Higher Education Fund" in Budapest, created with a World Bank loan to improve conditions at universities in Hungary—sees this as a bottleneck problem: As soon as you put in money for one item, a new bottleneck appears. For example, the fund will pay for new laboratory equipment for students, but the only place to put the equipment is in buildings that are "collapsing." Hungary cannot afford to rebuild them. Havel sees the same problem occurring at the Central European University in Czechoslovakia. "The [New York-based] Soros Foundation gave us $5 million, which was very generous. But our side had to find an appropriate building in Prague with high enough standards for a Western organization. For us that was a lot. It's like offering us a yacht without a compass when we can't afford a compass. What do we do? Give back the yacht?"



CHARITÉ

One of the best. Charite Hospital director Cornelius Frömmel hopes to bring the East Berlin research institute up to Western standards within a decade.

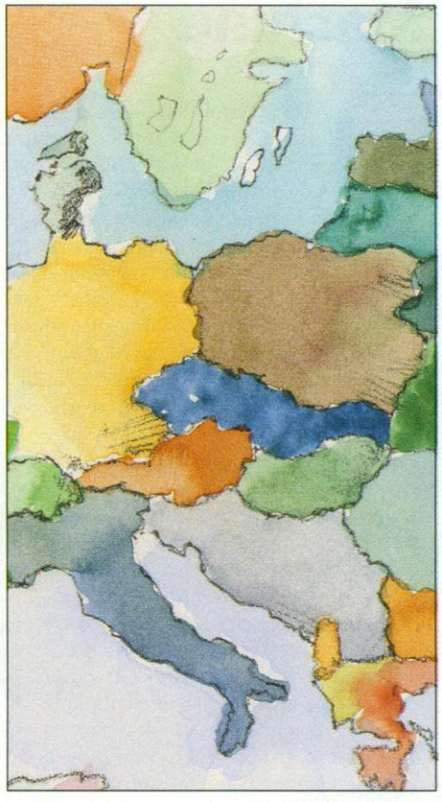
One consequence of the budget crisis and the increased freedom to travel is predictable: Researchers have left in droves for greener pastures in the West. In Czechoslovakia, young scientists have almost vanished. When Jan Konvalinka, one of the few researchers in his mid-30s still to be found in the halls of the Academy of Sciences complex on Fleming Square in Prague, was asked the percentage of graduate students and postdocs going abroad, he replied simply: "One hundred percent."

Most nations have realized it is useless to try to fight the brain drain. Instead they are hoping that scientists can be "parked" overseas while infrastructure is improved. The measure of success is shifting from, "How many young scientists have you persuaded to stay?" to, "How many do you think you can get back, even temporarily?" In Hungary, one of the most economically advanced countries in Central Europe, scientists' salaries, like those of the general population, "are not keeping pace with inflation at all," says academy president Kosary. Therefore, he is encouraging even those researchers who want to stay in Hungary for the long term to find jobs abroad for one-quarter to one-half the year.

For those staying behind, the key issue is the need for impartial evaluation of existing scientific institutes to determine where best to invest scarce funds. So far, Germany is the only country to have done a comprehensive review, although there have been partial evaluations in all the other countries. Scientists in eastern Germany believe that they know how to make it work. Says Alfred Schellenberger of the University of Halle, "We are sure that the other countries are in no position to evaluate themselves. It will work only if 80% to 100% of the evaluators come from outside. Otherwise it will end in a hopeless fight."

Indeed, this is exactly what seems to be happening. Says Jan Konvalinka of the Academy Institute for Organic Chemistry in Prague, "You need either a carrot or a stick to reorganize research effectively—either additional funds for the winners, or the political power to shut down the losers. In our country, we have neither." Therefore, says another Prague researcher, serving on an evaluation committee is a "nightmarish experience." Of 12 people on his committee, recalls this researcher, only three or four had published in reputable journals,

Central Europe at a Glance



Eastern Germany. This is the only part of Central Europe where major investments are being made in science and technology. Will they prove worth it? Or will the east become just a poor relation, like southern Italy? The answer depends largely on the success of the massive efforts to evaluate institutions and recruit good scientists to work in the east. The next year will be critical because most of the professorships at universities, for example, will be filled by 1993. After that, it will be hard to make any changes for decades.

Results so far have been widely divergent. The East Berlin Charite Hospital expects to achieve an international reputation in just 10 years, in the admittedly optimistic view of its director of research Cornelius Frömmel. Dozens of qualified people from the west and the east are applying for each position, he says. But in the outlying city of Halle, two hours from Berlin by train, it will be more difficult, says Lutz Nover of the Institute for Plant Biochemistry. Of 130 people who have so far applied for the directorship of the institute, very few were really qualified, he says. This has more to do with the quality of housing and schools in the region than it does with the institute, which got one of the best ratings in the Science Council's evaluation.

Hungary. Living since the late 1960s under partly capitalist "goulash Communism" has given Hungary a head start, with freer travel and fewer ideological constraints on researchers than in neighboring states. Tamas Horvath [of the Catching up with Europe Higher Education Fund] believes that the universities are on a path to "long-term stability", but the Academy, is in greater difficulties. U.S. science attaché Lawrence Cohen concurs. "The money they need," he says, is "just not there." Therefore, he says, the pace of improvement will depend on the enlightenment of administrators — if they can make the tough choice to fire people now, their institutes will be in better shape in the long run. Otherwise, "they will all sink together."

Poland. Like Hungary, Poland had a 25-year head start on restructuring, since travel restrictions were dropped on researchers as early as the 1960s. Therefore, researchers know more what to expect from a merit-based system. Also, Poland has gotten over one significant hurdle by delegating authority to a state committee to decide which Academy institutions to keep supporting. Committee chairman Witold Karcziewski says that, after a budget increase in March restored some deep cuts made late last year, the "best institutions won't even notice there's an economic crisis" in 1992. By nurturing the best institutes, Karcziewski hopes to create centers of excellence that can then serve as magnets for returning émigrés. "But everything is dependent on the development of the economy," he asserts.

Czechoslovakia. Here, the sense of paralysis is the worst in the entire region. The damage done by Communist ideology to science since 1968 was greater here than in Poland and Hungary, where scientists could travel freely. And now, the country is wracked with controversy over whether public sector employees, including university professors, should be held accountable for "collaboration" with Communist regime in the dark period from 1969 to 1989. If the answer turns out to be yes, this could be devastating to many faculties. On top of that, the country will decide probably within the next year if it is to split into two pieces, the Czech lands and Slovakia. If fission occurs—which looks increasingly likely—the impact would be negative for science, says Slovakia's education minister Jan] Pisut, since, even with the "friendliest split possible," the GDP in both parts of the country would drop by at least 10%.

–S.D.

and the majority of the committee members themselves deserved to be fired. Not surprisingly, he says, "we were not able to reach any kind of conclusions."

Both Poland and Hungary are moving toward an evaluation of their institutes that researchers will accept. In Poland, for example, the parliament created a state committee for scientific research called KBN that has the power to distribute budget money to academy and university institutes based on merit. KBN is already eliminating support for the least promising institutes, and the procedure seems to be going well, according to chairman Witold Karcziewski.

But there is one reason to believe that Karcziewski's optimism may turn out to be premature: an attitude among scientists that came from 40 years of living under communism and that makes it hard to perform credible peer review and to accept its results. "Even if peer review is fair, people's first instinct when rejected is to suspect some conspiracy or subterfuge," says physicist Andras Potkos of Lorand Eötvös University in Budapest. This is the single greatest threat—after lack of money—to setting up effective structures in central European science, says Cohen. He notes, for example, that in the Hungarian Academy of Sciences, reviewers are not forced to justify their decisions in writing, which demoralizes those who receive negative reviews. "And when I try to tell them to improve this," he says, the academy reacts so defensively, it is "as if I am questioning their masculinity."

The unproductive attitude of many researchers in the region also derives from living under a system where doing mediocre science was an easy meal ticket. Therefore, even when researchers are given the best equipment, as in eastern Germany, that is no guarantee for success. At the Center for Molecular Medicine in East Berlin, where the new director has won praise from his eastern staff for giving them a chance to prove themselves, one eastern staff member says that the results so far have been disappointing: "The director expected that the level of people's science would rise quickly once they were given the right conditions," says the researcher. "But this is likely to turn out to be an illusion. People just can't seem to adapt to the new conditions." In addition, the turmoil has left researchers bewildered. Says Cornelius Frömmel, director of research at the prestigious Charite Hospital in East Berlin, "People are so preoccupied with their own problems and the immediate future, they don't take advantage of the new opportunities."

But for most researchers, new opportunities are few and far between. With no life raft from the West likely to appear, they are barely hanging on, hoping that the region's economies will eventually rise and buoy science's fortunes along with them.

–Steven Dickman

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