EXPANDING EU
▶ SLOVENIA

Money and Mentors Hold Onto Young Researchers

LJUBLJANA, SLOVENIA—When biochemist Vito Turk strolls around the modern research campus where he works, he sees a healthy mix of younger and older scientists. "We don't have a major 'brain drain' problem," boasts Turk, who directs Slovenia's premiere basic-research center, the Jozef Stefan Institute. "Slovenian scientists tend to return home." For a country the size of New Jersey, with a population of only 2 million, Slovenia—the first republic to break away from the former Yugoslavia—has a remarkably resilient research sector.

Much of the credit for training—and retaining—a talented pool of young Slovenian scientists goes to the government's "2000 Young Researchers" program, which provides research "mentors" and laboratory work for graduate students. It is Slovenia's innovative way of plugging the brain drain that has severely hurt research throughout post-communist Europe. "In this part of Europe, many talented young people who formerly studied the sciences are now pursuing careers in economics, law, and business," says Robert Blinc, a physicist who is vice president of Slovenia's science academy. He says the Young Researchers program "has helped revitalize Slovenian research institutes."

According to the research ministry, a mere 3% of new Ph.D.s leave Slovenia for good, although many of them do postdoc research abroad. Under the Young Researchers program, the government provides funds to universities and research institutes for M.A. and Ph.D. students, covering the costs of their university education and their salaries as researchers. "It gives students both a mentor and a place to work," says biomedical engineer Renata Karba, a 1995 graduate of the program who is now a counselor to Slovenia's science minister. "Mentors want as many of these young Ph.D. students as possible, because they are good research assistants."

The main architect of the Young Scientists program, Boris Frlec—a chemist who is now the nation's foreign minister—told *Science* that it "has been successful beyond our original expectations. It was meant to revitalize the then-aging Slovenian research community and, indeed, has yielded so far about 1900 highly trained young researchers." That includes nearly 80% of all students who got their Ph.D. in Slovenia last year, when the program—which covers all fields of sciences, including social sciences—accounted for about 20% of the Research Ministry's total budget.

"We don't have a major 'brain drain' problem."

—Vito Turk

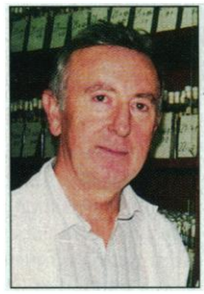
Most scientists say it is worth the high cost. Dragan D. Mihailovic, a physicist who returned to the Stefan Institute after studying at Oxford University, calls the program "extremely effective," adding: "The biggest benefit is that young Slovenian researchers gain great self-confidence from the experience of working side by side with some top-flight scientists."

But there is a downside to the 10-year-old program. Milos Komac, who heads the ministry's Division for Scientific Programs, says, "the problem is finding appropriate jobs for these talented young people." While the goal was for two-thirds to go into industrial research, Komac says, most new Ph.D.s "tend to stay at institutes and universities." Adds Komac: "We are now producing more Ph.D.s than we can decently employ." **–ROBERT KOENIG**

EXPANDING EU
▶CZECH/SLOVAK

Bringing Diverging Paths Back Together

BRATISLAVA—The breakup of Czechoslovakia into the Czech and Slovak Republics 6 years ago today interrupted seven decades of joint scientific effort. Since then, Slovak and Czech scientists have, in most cases, formed separate research organizations pursuing different national research policies as the two nations—partners from 1919 to 1993—set off on diverging paths. Last year, the Slovaks found out just how far those two paths had diverged: When the European Union (EU) selected five central European nations as fast-track candidates for membership, it included the Czech Republic but left out its Slovak neighbor. In a few years' time, the Slovaks may find themselves almost entirely surrounded—apart from a short border with Ukraine—by EU members.



"Slovak scientists ... need support from Western Europe."

—Peter Biely

In some ways, it is unfair to directly contrast Czech and Slovak science, as the Czech Republic is a larger country with a longer scientific tradition and a stronger industrial sector. But comparisons are inevitable. According to data produced by Philadelphia's Institute for Scientific Information on the citation impact of scientific papers from 1993–97, Slovakia ranked last out of 33 European nations (excluding former Soviet republics). The Czechs ranked only slightly better at 29th. Since the Czech-Slovak split, the Slovak research budget has lagged behind and Czech researchers have taken part in more EU-funded research projects.

While both the Czechs and Slovaks have restructured their academy institutes—cutting employment roles to half their 1989 levels—they both continue to struggle with tight science budgets, low salaries, and—to a greater extent in Slovakia—the loss of young researchers to the west. A recent report on Slovak science by the consulting firm Coopers & Lybrand, commissioned by the EU, found that "there is little cooperation between research institutes and the universities or industry, and organizational structure is often poor." In contrast, the consultants found the Czech Republic—despite some nagging problems—to be "relatively advanced in its scientific transformation."

While some Slovak

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scientists fear falling further behind the Czechs after the EU's next round of expansion, others are optimistic that Slovak research will be able to catch up with its neighbors. They cite two reasons: the government's move to join the EU's Framework 5 program as an associate member (see p. 22) and the recent defeat in general elections of a nationalist anti-EU government that was cool to the Czechs. The new Slovak administration has made overtures both to its neighbor and to Brussels.

Among the optimists is Jozef Simuth, a molecular biologist who is deputy secretary-general of the Slovak academy. His laboratory has collaborated with both U.S. and European partners and he believes Slovak researchers will fare well in Framework 5. Similarly, Michael Novak, who directs the academy's Institute of Neuroimmunology, says joining Framework 5 will have significant long-term advantages for Slovak science. "It's vital that Slovak scientists have the opportunity to get involved in these EU research projects," he says. Peter Biely, a researcher at the Chemistry Institute, agrees: "Slovak scientists have a great deal to offer, but we need support from Western Europe."

The Slovaks are well placed to profit from collaboration: Their capital, Bratislava, is close to Vienna and to Hungary, and just a few hours' drive from scientific centers in the Czech Republic. "We expect to get a big boost from Framework 5, and from improving our scientific cooperation," says Ivan Trebaticky, a computer scientist who directs the Education Ministry's international cooperation branch. And relations between the two republics are thawing. Trebaticky's Czech counterpart, Peter Krenek—who heads the Czech Education Ministry's department of international cooperation—says the two countries expect to sign a new bilateral agreement on science and technology cooperation later this month. Observes Krenek: "There are no problems between Czech and Slovak scientists—just problems between politicians, which we are now overcoming."

—ROBERT KOENIG

EU EXPANSION

▶ U.S. AID

End of Joint Programs Leaves Researchers Feeling Jilted

During the Cold War, countries behind the Iron Curtain strived to keep their research under wraps and their scientists politically isolated from the West. Particularly vigilant against the corrupting influence of scientific intercourse was the Czechoslovak government, which refused to allow even the token research exchanges with the United States that were occurring under a more liberal regime in neighboring Hungary. But when Czechoslovak authorities eased their stranglehold on culture in 1988, the U.S. National Science Foundation (NSF) quickly jumped in, signing a bilateral agreement that June to fund joint research and workshops.

"By the time the Velvet Revolution took place in 1989," says an NSF official, "we were able to open doors to them." The State Department soon followed, launching a joint research fund there in 1991. Although the sums of money provided by the U.S. side were small, the program "had a very positive psychological impact," says Josef Syka, director of the Institute of Experimental Medicine in Prague.

Those heady days are, alas, over. Three years ago, the State Department ended its contributions to joint research fund programs throughout eastern and central Europe, as the focus of attention shifted to the plight of former-Soviet weapons scientists. While collaborations sponsored by NSF and other agencies continue, the former Soviet satellites must now find the bulk of their support in the harsher realities of post-communist Europe (see p. 22).

The State Department programs helped catalyze efforts to remodel research programs along western lines, incorporating peer-reviewed grant competitions and other strategies, according to researchers in participating countries. They required that host countries provide matching funds and bypassed ingrained Soviet-style systems in which institute directors divvied up budgets according to their whims. Instead, expert panels from the United States and each host country reviewed proposals and selected the best science to fund. "The program was not considered so much as aid but more as a chance for collaboration," says Syka.

The U.S. joint fund program "had a very positive psychological impact."

—Josef Syka

The joint funds—ranging from tens of thousands of dollars per year in Slovakia to more than $1 million a year in Poland—were a fraction of what the European Union (EU) was spending in the region. "It wasn't the sums of money that were so important," says Ivan Trebaticky, director of international scientific cooperation at Slovakia's Education Ministry. Rather, it was the spirit of cooperation they engendered.

But the State Department's whirlwind romance with central European researchers, and sudden departure, has left recipients of that attention feeling jilted. "Seduced and left alone" is how Istvan Szemenyei, former science counselor at the Hungarian Embassy in Washington, D.C., puts it. The loss has left some researchers speculating about ulterior motives. "I think the U.S. has already changed its attitude to these countries and sees them as prospective competitors rather than partners," says plant biologist Andrzej Jerzmanowski of the University of Warsaw. A State Department official says the program was an innocent victim of budget cuts. "We had not intended the programs to end unilaterally and abruptly," says the official, who requested anonymity. She adds that her division has since helped hook up central European researchers with programs at NSF, the National Institutes of Health, and other U.S. agencies.

Although no white knight has appeared to replace State Department aid, some nonprofit foundations have stepped into the breach. The most prominent is the Howard Hughes Medical Institute, which in 1995 awarded 5-year grants—averaging about $35,000 a year—to 50 young biomedical researchers across the region (*Science*, 14 July 1995, p. 155). And while it has focused mostly on stimulating free-market economic growth, the Andrew W. Mellon Foundation has provided a handful of grants for projects that directly benefit researchers, including $350,000 worth of computer equipment for the Czech Academy of Sciences' Institute of Information Theory.

The challenge for the region's scientists will be to preserve what connections they have with U.S. colleagues while attempting to weave themselves into the fabric of the EU. "Our cooperation with the EU is clearly on the rise," says Andrzej Wiszniewski, president of Poland's KBN granting agency. "But I don't think we should cut back on our scientific ties with the U.S." —RICHARD STONE

With reporting by Robert Koenig.

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