GERMAN UNIVERSITIES

Humboldt Hits the Comeback Trail

Once a haven for Nobel laureates, Humboldt University lost much of its influence years ago. Now Humboldt is endeavoring to win back talent and recapture lost glory

BERLIN—The ghosts of science past greet those who ascend the marble staircase in Humboldt University's cavernous main building. Staring from the walls of a photo gallery are the visages of Max Planck, Fritz Haber, Robert Koch, and 26 other Nobel Prize winners with ties to the university—nearly all of whom carried out their prizewinning work before World War II. These scientific giants might not recognize their old haunt if they could see it today, considering how far Humboldt fell during the Cold War. "We'd like to rebuild Humboldt's reputation as a great research university," says the university's new president, physicist Jürgen Mlynek, and "add a few new photos" to the wall.

Mlynek and reform-minded officials at other universities face enormous challenges: tight funding, a rigid hierarchical system, and a decline in the number of international students who are fluent in German, to mention a few. They also must stem a brain drain. For decades, some of Germany's best university researchers have moved to Max Planck institutes or to the United States, where they receive more money and freedom. One recent study found that one of every seven young German scientists takes a post in the United States. "There's a great hunger for research in Germany's university system, and we need greater resources to meet that demand," says biochemist Ernst-Ludwig Winnacker, president of the Deutsche Forschungsgemeinschaft (DFG), the granting agency with the biggest pot of basic-research funds for German university scientists.

Barred by law from charging tuition, Humboldt and Germany's 86 other universities must be innovative in finding extra money. Many, including the Technical University of Munich (see story below), have tiptoed into private fund raising. This is a rare practice in Germany, where universities have relied almost exclusively on state funding. Indeed, many, including Humboldt, have little choice, because state funds are declining and they find themselves competing on an uneven field. "The economic support and the attitudes toward universities vary greatly from Berlin to Bavaria," says Klaus Landfried, who heads Germany's organization of university presidents and rectors.

However, the rigid structure in which German universities operate is beginning to loosen, and that should help the universities shake themselves out of their malaise. Last year, for example, the Max Planck Society opened its first 10 International Max Planck Research Schools in association with universities in an effort to attract more foreign students (see p. 821), and Germany's 16 national research centers are expanding ties to universities. Other initiatives under way include an effort to phase out Germany's Habilitation requirement—a long-term apprenticeship for a tenured faculty position—and a parallel move to create "junior professor" slots (*Science*, 5 January, p. 23); an expansion of the DFG's mini–graduate school program; and a new DFG effort to build up research centers at a few universities. At long last,

Once and future powerhouse? Humboldt is driving to win back talent.

contends Winnacker, German universities "are heading in the right direction."

Humboldt is certainly heading that way. The university was founded by philologist Wilhelm von Humboldt in 1809 and became a model "modern university," combining stellar research with broad education. During the 1800s, the university attracted

A Strong University Grows Stronger

As Jürgen Mlynek beefs up Humboldt University's research, he might look for inspiration from the recent reforms that have helped to propel the Technical University of Munich (TUM) in Garching into the upper echelons of German universities.

Since becoming TUM's president in 1995, Wolfgang A. Herrmann has taken advantage of Bavaria's generous funding and university-law reforms to pump up TUM research in fields from nutrition to physics. Because Bavaria allows its universities to give more authority to their presidents, Herrmann says, "when we have an important initiative—say, forming a new spectroscopy center, or establishing a new research focus—we now have a much faster decision-making process to approve and carry it out."

Bavarian bulldog. Wolfgang Herrmann (right) fought for new neutron source.

A chemist by training, Herrmann takes pride in the research facilities that have emerged, including the Central Institute for Medical Technology, the Life Sciences Center, and the biggest construction project in the university's history: the $500 million FRM-II neutron source. Scheduled to open later this year, the FRM-II will provide neutron beamlines for experiments in particle physics, materials science, medicine, and other fields. When the FRM-II project proved controversial because it will use as fuel for its reactor highly enriched uranium—an ingredient in nuclear bombs—Herrmann lobbied the German government to allow construction. The federal environment ministry is now reviewing TUM's final application for the operating permit.

Herrmann also dug his spurs into the university to get it to solicit more private donations—raising about $45 million from businesses and alumni since the fund-raising campaign started in 1998. TUM has also sought to attract more foreign students by offering graduate courses in English. The initiatives are starting to pay off: The percentage of foreign students at the university has more than doubled to 13% since Herrmann took over, compared to roughly 7% nationwide. Says Herrmann: "English is the lingua franca in science—that's a fact we have to accept." **–R.K.**

CREDITS: R. KOENIG

Teaming Up to Woo Young Hotshots

BERLIN—With "brain gain" its goal, Germany's scientific establishment is joining ranks to attract more foreign students and researchers. Last fall, the country's premiere basic-research organization, the Max Planck Society, set up 10 graduate schools with universities—from Göttingen's Molecular Biology and Neurosciences school to Garching's astrophysics school.

The schools aim to lure high-quality graduate students (at least half of whom must be foreigners) by giving young scientists the chance to work with Max Planck researchers and to receive Ph.D. degrees from nearby universities. The first set of International Max Planck Research Schools has attracted more than 100 foreign Ph.D. students—mainly from Eastern Europe, India, and China. "We expect to have at least 30 such research schools in operation within a few years," says Max Planck president Hubert Markl.

The Max Planck initiative is one of several recent steps taken to boost Germany's share of the 1.8 million students a year who pursue their studies or research outside their country of origin. Whereas U.S. universities capture about a third of those wandering scholars, Germany now snares only about 8%.

The German research ministry's new University Future Initiative program is launching an effort to attract more top foreign Ph.D. students and guest professors. And the German government recently began issuing residency permits, similar to U.S. green cards, to foreign scientists in high-demand fields such as computer technology, where German employers are facing shortages.

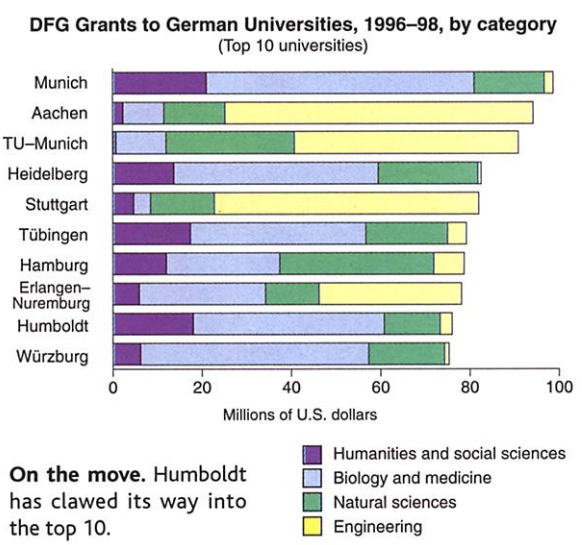
"It's a shame that Germany lost much of its international appeal for students over the last 30 years," says Wolfgang Herrmann, president of Munich's Technical University. "We have to market our universities better." **–R.K.**

thinkers as diverse as philosopher Georg Wilhelm Friedrich Hegel and political scientist Karl Marx. In the first 3 decades of the 1900s, Humboldt and its medical faculty at Charité Hospital—where bacteriologist Robert Koch and immunologist Paul Erlich once worked—was one of the world's top science centers.

But the rise of Nazi Germany, the devastation brought by World War II, and the restructuring of Humboldt along Soviet lines—with much research moved out to the East German Academy of Science—drained the university of a lot of its vitality. Although Humboldt remained East Germany's top university, after German reunification in 1990 about 400 professors—three-quarters of the faculty—retired or were asked to leave. Two frequent reasons for pink slips were an individual's Marxist ideology or research that failed to meet Western standards.

The wrenching transition allowed Humboldt to acquire "some first-rate people," says Mlynek, a quantum optics physicist who last summer moved to Berlin from Konstanz University. Among Humboldt's recent recruits are physicist Dieter Lüst and biologist Bärbel Friedrich, fresh blood that has helped boost Humboldt from 29th to ninth place in DFG grants to universities (see table); it now pulls in around $76 million a year in grants. Encouraged by that growth, Mlynek has set a goal of doubling the university's outside grants over the next few years. "In 10 years, we want Humboldt to be as good as the best U.S. research universities," he says.

The latest push to overhaul Humboldt began last December, when Mlynek's administration unveiled a program to promote more independence for young researchers and a renewed commitment to move the university's natural-science faculties from outmoded buildings downtown into new labs in Berlin's Adlershof Science Park—the East German Academy's former main campus. Humboldt's computer science and math departments recently moved to Adlershof, the chemistry institute will open there this summer, and physics will follow in 2002. The university's vice president for research, computer scientist Hans Jürgen Prömel, says the move will give researchers topflight labs and put them in the same complex with advanced nonuniversity researchers, including those at the BESSY II Synchrotron and the Max Born Institute for Non-Linear Optics. Humboldt chemist Hans-



On the move. Humboldt has clawed its way into the top 10.

SOURCE: DFG

Werner Abraham, who now works in a century-old building downtown, says he and his colleagues are looking forward to the new labs and "the synergistic effect of cooperative research," especially in fields such as laser chemistry and materials science.

But the Adlershof move—which was nearly canceled a few years ago during Berlin's budget crisis—has drained Humboldt's coffers, which Mlynek must now rebuild to be able to afford to hire more topflight scientists and to implement further reforms, such as creating a new center for young researchers. Berlin's contributions to Humboldt have dropped precipitously over the last 6 years, Mlynek claims; personnel costs amount to more than three-quarters of the budget, and fixed expenses eat up nearly all the rest. "That's why we need 'fresh money,' " he says, some of which he hopes to accumulate through a major fund-raising campaign.

But increased government support will be crucial for meeting the university's research goals. The DFG is asking the government for a major budget boost for next year to beef up grants to universities. This year, the DFG will receive a hefty portion of the windfall from the government's sale of frequency bands to launch an initiative that could make a big difference to a few universities: a fund to establish or expand large research centers and help pay for their buildings, equipment, and salaries. The DFG expects to be able to fund only two or three of 80 applicants this year.

The DFG has also launched the Sonderforschungsbereich programs, which bring together researchers from universities and elsewhere to work on special projects—from a cell biology initiative in Cologne to a study of autoimmune reactions in Munich. But even the program's $320-million-a-year budget doesn't go far: About 130 applications for such grants are now stacked up, many worthy but on hold until next year or beyond.

Despite perennial money woes, many German universities are on the upswing. "Ten to 20 of Germany's universities have the potential to become truly international research centers," says DFG vice president Bruno Zimmerman. After shaking off its Cold War blues, Humboldt has found itself squarely on that list.

–ROBERT KOENIG