says Murray Sachs, chair of the bioengineering department at The Johns Hopkins University in Baltimore. Barr says NIH has supported "a lot of good [bioengineering] work," but because the individual institutes are organized by disease and organ systems, "they haven't found a way to support bioengineering projects in their own right."

Support for a bioengineering institute isn't unanimous, however. Sachs says he is "of mixed mind" because of the possibility that the disease-oriented institutes might reduce their bioengineering support. "I would not want my own research [on the neurophysiology of hearing] anywhere but in the deafness institute," he says. Even more firmly opposed to creating a new fiefdom is Douglas Lauffenburger, director of MIT's Center for Biomedical Engineering. He says a separate institute would take the field a step in the wrong direction. What's needed instead, he says, is "to bring engineering and fundamental biology into more intimate contact and collaboration. That's where the advances will come from." And the place to forge such collaboration, he adds, is in the existing NIH structure.

Senator Frist, chair of the Public Health and Safety Subcommittee of the Senate Labor and Human Resources Committee, believes bioengineering should have a home of its own at NIH. Frist, a former NIH grant recipient, last year introduced legislation to create a National Center for Bioengineering Research within the National Heart, Lung, and Blood Institute. He plans to include the idea in an overall NIH Reauthorization bill this summer—although passage this year is doubtful.

Varmus rejects the idea of a separate institute or center: "I'm always a little concerned about ghettoizing an area by institutionalizing it." Noting that every institute has a stake in bioengineering, he adds, "You run a risk if you say we're going to put bioengineering in one office or center."

Nerem retorts that by that rationale, NIH should scrap NIGMS, because every NIH institute also does basic research. In fact, Nerem contends that everything NIH has been doing to highlight bioengineering—such as the creation of BECON and the "flag-waving" of the February symposium—is simply a response to pressure from Frist: "My gut-level feeling is that if Frist stopped pushing, everything would grind to a halt."

The big question, of course, is how much money is NIH willing to put behind its bioengineering thrust. It's a question Varmus won't answer—at least not precisely. "I never try to predetermine this," he says. The best way to proceed "is to bring a lot of forward-seeing people together, let them propose some ideas, test some of them out with pilot grants, and see what's productive," says Varmus. "But I do think we're prepared to place more emphasis in this area."

Frist, Nerem, and other supporters of bioengineering will be watching NIH closely over the next year to see what happens.

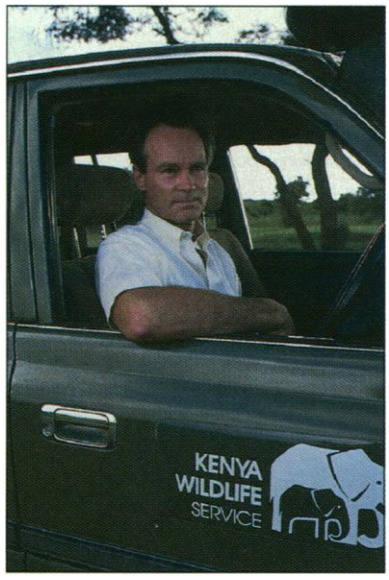
–Bruce Agnew

Bruce Agnew is a writer in Bethesda, Maryland.

CONSERVATION

Ousted Kenya Parks Head Gets Job Back

David Western, the conservation biologist who was sacked on 21 May as head of the Kenya Wildlife Service (KWS), was reinstated 6 days later for a 9-month term by Kenya President Daniel arap Moi. "Exhausted" by his roller-coaster ride in Kenyan politics, Western says he now hopes to be able to complete the restructuring of the cash-strapped agency, which runs Kenya's national parks and other protected areas. He believes he was dismissed in large part for refusing to allow mining concessions on park lands, so he sees a positive side to the week of turmoil: His reinstatement "sends a very clear message that KWS lands are not up for grabs."



W. STONE / GAMMA LIAISON

This "sends a very clear message that KWS lands are not up for grabs."

—David Western

Western, who is highly regarded by the international conservation community, took over KWS in 1994 from anthropologist Richard Leakey. Although Leakey had focused on rehabilitating the parks and guarding them from poaching, Western has also been trying to involve communities outside the park system in conservation. But he has faced a financial crisis as tourist revenues—the backbone of KWS support—dropped drastically owing to bad weather and political strife (*Science*, 24 April, p. 510). Things "have been really extremely tough" over the past year, he says.

In a telephone interview with *Science* last week, Western said that in recent months he had sensed that his support within the government was waning because he was resisting pressure by officials to open up some parks to mining operations. He had also been taking a drubbing from opponents in Kenya, including Leakey, who complained that he was a poor manager and criticized his community conservation strategy. Western says these criticisms may have given his opponents a pretext for ousting him: "I think what has happened is this rather futile debate [over whether conservation efforts should focus on the parks or outside them] ... was simply used as an excuse for other political interests to take over."

The reaction to Western's dismissal (*Science*, 29 May, p. 1335) in Kenya and abroad was swift and vehement. Fearing for the future of Kenya's parks and wildlife, conservationists wrote letters (see p. 1507) and the European Union (EU) froze some $3 million in operating funds that it had just approved for KWS.

Western says that he requested a 27 May meeting with the president to clarify what was happening at KWS, and discovered at the meeting that Moi "wasn't fully au fait with events." He says Moi was particularly concerned that the civil service had violated its own procedures by breaking Western's contract, which had been renewed early this year and reaffirmed on 20 April at a KWS board meeting, but—ominously—had never been recorded in the government *Gazette*. Western also says Moi recognized the toll that the ouster could take on tourism and international support. Indeed, he says, in the fight to keep mining concessions out of the parks, "the biggest supporter I had in this had actually been the president himself."

Western is now trying to "consolidate the direction" of KWS. The agency is reducing its staff from 4100 to 2600 employees and closing 51 field stations. Earlier this month it outlined a "minimum conservation area" strategy that should save

scarce resources by focusing on parks and high-biodiversity locales while withdrawing from areas less vital for wildlife. He is also lining up new support from various donors as a 5-year commitment to KWS by the World Bank winds down. He says he has commitments totaling about $30 million for the next 2 or 3 years, and he hopes to line up an additional $20 million for elephant and biodiversity "trust funds." The ultimate fate of the KWS, however, will depend on the rebound of the tourist industry.

When his term is up in 9 months, Western says he would like to see the job divided in two, with management handled separately from conservation. Asked what he will do after he steps down, he says he "will write up 30 years of research."

"Many of us are pretty happy" about the latest turn of events, says Charis Cussins, a visiting professor of science and technology studies at Cornell University who does research in Kenya. The Western reinstatement, she says, is at least a temporary "vote of confidence for African conservation by Africans."

–Constance Holden

IRELAND

Peace Process Set to Boost Collaboration

When Irish voters backed the historic peace deal in separate referenda in the North and South last month, many researchers saw it as a step toward increased scientific collaboration across the border. One reason: The new Northern Ireland assembly, to be elected later this month, will create a North-South Council with a pot of funds to set collaborations rolling in areas of common interest between Northern Ireland and the Republic. The peace agreement specifically mentions agriculture, the environment, European Union (EU) programs, fisheries, and health—all of which could include a significant scientific component—and the council itself could add other areas. "Science could be an early and relatively noncontroversial area for enhanced collaboration," says an official in Dublin's Office of Science and Technology.

Researchers on both sides of the border are eager for that to happen. Many have been meeting regularly and collaborating informally with colleagues across the border for years through organizations such as the Royal Irish Academy and the Biochemical Society, which draw their members from all of Ireland. And in recent years more formal collaborations have begun to flourish. Colm Lawler of Dublin-based BioResearch Ireland, which funds projects to help foster the biotechnology industry, has several projects with researchers in Northern Ireland. "Getting partners in the North is easier than in other countries because they are close, there's no language problem, and many scientific institutions cover all of Ireland so we know people better," he says. Adds biochemist Luke O'Neill of Trinity College, Dublin, "Scientists are always going to collaborate, but these developments [the peace agreement] can only be for the good."

A number of barriers to North-South collaboration remain, however. One is unequal support for research in the North and South. Northern Ireland, as part of the United Kingdom, has a long tradition of comparatively generous basic research funding. In contrast, government funding for basic research in the Irish Republic seldom exceeds subsistence level. And it has remained low in spite of efforts by recent governments to highlight the importance of science to the economy and attract industrial funding, culminating in the Republic's first-ever policy white paper on science and technology 18 months ago. "I estimate the public funds for nonsalary costs are around five times higher for biochemistry in Queen's University in Belfast compared to here in Trinity," says O'Neill. "We just have to try harder to get funds from elsewhere."

One consequence of this imbalance is that researchers in the South tend to focus more on industrial applications that can compete for EU or industry funding. "Researchers in the North looking to exploit their work industrially may well find good partners in the South, but if they are looking for basic collaborators, it can be much more difficult," says computer scientist Ron Perrott of Queen's University.

IRELAND NORTH AND SOUTH: A COMPARISON OF PHYSICS FUNDING

	Queen's University Belfast	Irish Republic
Typical annual public funding	$1.8 million	$0.8 million
Number of current projects	20	40
Number of permanent staff	25	50
Average support per project	$88,000	$20,000
Average support per researcher	$72,000	$18,000

SOURCE: ROYAL IRISH ACADEMY FOR 1996

But in some areas, such as biotechnology, the industrial focus has led researchers in the South to steal a march on their northern colleagues. Jeremy Carmichael, director of the Centre for Innovation in Biotechnology at Queen's University and the University of Ulster at Coleraine, is keen to learn from successes in the South. His center collaborates with researchers in the South through BioResearch Ireland. Joint demonstration projects include one to use waste from the brewing industry as a source of enzymes for cleaning up dye pollution from the textile industry; another is developing diagnostic tests for the early detection of pathogens that affect the important Irish mushroom-growing industry located in the border region. "There's enormous potential in Irish biotechnology, and the important thing will be to convince the North-South Council to look at the economic potential of investing in the life science sector," Carmichael says.

Moreover, collaborations are not confined to the life sciences. Perrott recently inaugurated the kind of collaboration that researchers hope will blossom in the new environment. Earlier this year, an IBM SP-2 supercomputer, funded jointly by Trinity College and Queen's University, was installed at Queen's. The two universities will jointly manage the machine—the largest computer in Ireland and one of the most powerful in Europe—to conduct a range of molecular modeling and other data analyses. Trinity researchers will make use of their half share of the running time via high-speed data links. The $2.3 million to buy the computer came from both universities, grants from the EU, the U.K. Engineering and Physical Sciences Research Council, and private donations. And $1.6 million has been raised from the EU and other funding bodies for research on the new machine. Perrott says that discussions are now under way for joint research projects between researchers at the two universities.

Perrott, who heads the Queen's team, says there were clear advantages to choosing an Irish partnership. He says his group could have attempted a collaboration with a U.K. university, such as Edinburgh, Manchester, or Liverpool, but "we only have to get on a train or in our car to go to Dublin. Also, because we're two countries, the EU looks on our applications more favorably, as cross-national links are needed to be eligible for most of its research funds."

Researchers are hoping that such arrangements will become the norm as a result of the peace deal. "I'm optimistic," says Lawler. "I think the outcome of the referenda auger well for the future of research not only North and South, but also East and West between Ireland and Britain. It's good for science across the British Isles."

–Nigel Williams