Smiles and Status Quo at NSF

A low-key manner and a commitment to the agency's traditional missions have helped Neal Lane keep NSF afloat in rough waters. But is nice what NSF needs?

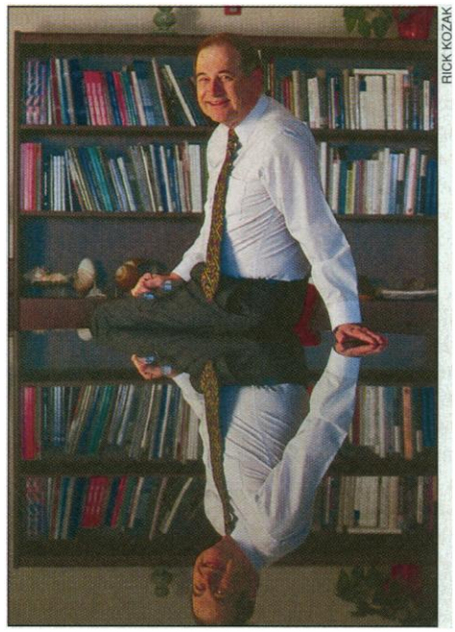
Don't look for Neal Lane this week at the headquarters of the National Science Foundation (NSF) in Arlington, Virginia. The NSF director is on "The Ice," accompanying Representative James Sensenbrenner (R–WI), incoming chair of the House Science Committee, on the legislator's first visit to Antarctica. Why is the 58-year-old physicist and former provost of Rice University freezing at the bottom of the world when he could be home with his family for the holidays? The short answer is that Sensenbrenner, whose panel oversees the $3.2 billion agency, which includes the $200-million-a-year Antarctic program, asked Lane to come along on the trip. And because the 40,000-kilometer excursion offers him a good opportunity to shore up political support for the agency, Lane said yes.

It's not the first time Lane has played this type of ambassadorial role. Earlier this year, he showed off another NSF-funded asset, the submersible *Alvin* operated by Woods Hole Oceanographic Institution, in an all-day, 1500-meter dive off the coast of southern California with Representative Jerry Lewis (R–CA). Lewis, a scuba-diving enthusiast, chairs the spending panel that sets NSF's budget. The trips exemplify Lane's service-with-a-smile approach to running the government's leading supporter of academic research. And the consensus is that it's working—at least for now.

Midway through his 6-year term, Lane has kept NSF largely above the partisan wrangling over the proper level of federal research funding by emphasizing its 45-year commitment to basic research, peer review, and training the next generation of scientists. It's a message that has helped NSF avoid the knife of Republican budget cutters—it got a 1.5% increase this year after level funding in 1996—and, combined with his affable and polite nature, the message appears to go over well.

"I think very highly of him," says Representative Steve Schiff (R–NM), chair of the science panel's basic research subcommittee. "As an authorizer, we hear from anybody with a gripe about the agencies under our jurisdiction. And I've gotten very few complaints about the job he is doing." Lewis praises Lane's "professional manner ... and credibility. What he tells you, you can rely on." And mathematician Phillip Griffiths, director of the Institute for Advanced Study in Princeton, New Jersey, also likes what he has seen. "He's done a superb job in clarifying NSF's traditional missions in research and education," says Griffiths, who recently completed a term on the National Science Board (NSB), NSF's oversight body.

Many observers also say that Lane's low-key manner is sending the right message to a government intent on downsizing. "Neal's style is appropriate for the times," says Jim Duderstadt, president emeritus of the University of Michigan and former chair of the science board. Not creating waves can also be good politics. "We've been pretty much ignoring NSF, and that's advantageous to the agency right now," says a Senate staffer who tracks the agency. "You could call it benign, but supportive, neglect."



RICK KOZAK

Polished image. Most policy-makers and scientists like what they have seen of Neal Lane.

Lane's approach has its limitations, however, notably a dearth of new initiatives. "NSF hasn't changed the way it does its business since I've been here," Lane readily admits. Asked to cite his major accomplishments, he mentions activities begun under his predecessors that have matured on his watch: large facilities like the $300 million gravity-wave observatory being built in Washington state and Louisiana and the $175 million, 8-meter Gemini telescopes in Hawaii and Chile, and thematic efforts like the 6-year-old systemic reform of precollege science and math education and a recompetition of the 11-year-old supercomputing centers under a new formula that emphasizes partnerships. One of NSF's biggest initiatives, a proposed $200 million renovation of the U.S. South Pole station, remains caught in bureaucratic limbo, nearly 3 years after NSF drew up its plans (*Science*, 24 June 1994, p. 1836).

There are some who wonder whether such a low profile is right for today's tough times. "If you decide to go with the status quo, then the sharks in the other agencies will feed on you [at budget time]," says Texas A&M University mathematician David Sanchez, a former head of NSF's directorate for mathematical and physical sciences and a member of its education advisory committee. "I'm disappointed in the lack of salesmanship," agrees Kumar Patel, vice chancellor of the University of California, Los Angeles. "NSF hasn't been able to convince the president or Congress that its vision requires their full support, or that it is essential for the health of the nation. And that's a lost opportunity."

A deft touch

The NSF that Lane took over in October 1993 had just received a 10% budget increase, delivered along with a stern warning from Senator Barbara Mikulski (D–MD), then chair of NSF's spending panel, to invest more in "strategic and applied" research. The appropriations bill would prove to be a high-water mark for the agency's fiscal fortunes. But Mikulski's admonition inflamed the scientific community, which was still upset at Lane's predecessor, Walter Massey, for not taking a more forceful stand against congressional efforts to shift the foundation away from its mission of supporting academic research.

Lane moved quickly to bank those fires. He assured his academic audience that NSF didn't intend to do anything differently while telling Mikulski a few months later that 75% of NSF's new budget request would be spent on research in seven fields that were priority areas for the Administration. It was a classic Lane performance: By coining a phrase, "research in strategic areas"—which Marye Anne Fox, University of Texas provost and former NSB vice chair, now describes as "not much of a change; almost a matter of inflection"—he defused a raging debate and took NSF out of the limelight.

This past year, Lane applied that same deft political touch in quietly killing a $100

million program to renovate aging labs on college campuses after he correctly sensed that political support for it had evaporated. The Academic Facilities Infrastructure program grew out of a long campaign by university administrators to win federal help for what is seen as a $10 billion problem. NSF officials had long argued that the program was too small to make a difference and that the foundation shouldn't be forced to carry the entire federal load. Faced with a tight budget, they proposed ending the program and moving half of the money into the research account to pay for large equipment.

The plan went through Congress without a hitch. "I asked research administrators if they were going to fight it," recalls one legislative aide, "and they said NSF's research account was their top priority." Roland Schmitt, president emeritus of Rensselaer Polytechnic Institute and a former NSB president, says he was in the minority on the board in standing up for the program in years past. But most of his colleagues, he noted, took the position that "people and programs come first."

Lane holds to the same priorities, and as a result he has focused most of his energies on preserving support for NSF's core clientele of academic researchers. The results are encouraging: Although NSF's overall 1997 budget of $3.27 billion increased by only 1.5% over 1996, Lane and other NSF officials often refer to a 5% increase—the growth in NSF's $2.43 billion research account. (NSF's budget also includes a $620 million education directorate, a $134 million account to support its 1200-member staff, and a major research equipment account, which this year stands at $80 million.)

Holding the line

Aside from protecting NSF's research account, however, Lane has proceeded very cautiously in putting his mark on the agency's science programs. He is now trying to get the White House to back three modest research initiatives (see sidebar), but most of the pending items on his plate predate his arrival. And some, like the $60-million-a-year supercomputing centers program now being recompeted, are legacies of Erich Bloch, NSF's strong-willed director from 1984 to 1990.

Lane's defenders say that a slow pace has allowed him to keep alive many existing programs. "He came in after several thrusts had been put on the table," says Tom Day, president emeritus of San Diego State University and a former vice chair of the science board. "But they could have been throttled at birth. Neal made sure that they would grow up."

Duderstadt believes Lane's personality has also contributed to preserving the status quo. "Erich followed a corporate style of leadership," he says about the former IBM executive. "Once he made a decision, he expected people to follow. Neal uses an academic style, where the key to building support is to get people to think that it's their idea. And that takes more time."

Lane has waged at least one quiet campaign: to encourage individual investigators to take more seriously their responsibilities as teachers and spokespersons for science. Responding to congressional and public unhappiness with the quality of undergraduate education, NSF will soon announce $500,000 awards to as many as 10 major research universities under a new program that honors faculty members who are active in teaching as well as research. "We want to get the attention of those institutions that focus on research," explained Anne Petersen, then deputy NSF director, last spring.

The attempt to turn NSF grantees into what Lane calls "civic scientists" has generated favorable press, in particular a speech

New Ideas Go With the Flow

National Science Foundation director Neal Lane has taken on few new research initiatives during his 3 years at the agency's helm (see main text). But he is now trying to get three new research programs included in the president's budget request, to be released in February.

The proposals are a classic Lanian blend of high-quality science and politically popular topics. NSF officials insist that the themes grow out of important work over the past several years in a number of related disciplines. But a White House official who requested anonymity is more skeptical: "I think it's a transparent attempt to get more money."

The first idea is a $20 million proposal to study Life in Extreme Environments. It hopes to capitalize on the excitement over last August's announcement that a martian meteorite found in Antarctica may contain fossilized evidence of ancient life on the Red Planet (*Science*, 16 August, pp. 864 and 924). Robert Corell, head of the geosciences directorate, says that the initiative includes ongoing studies of biological activity around deep-sea hot vents, the microbial diversity throughout the planet, and the evolution of the universe leading to life on Earth. Ernie Moniz, associate director for science in the White House Office of Science and Technology Policy, says he's excited about the idea and that "there's a feeling of a lot of market potential—grants and so on—to explore this subject."

The second idea, of similar size, is called Knowledge and Distributed Intelligence (KDI), a phrase that Vice President Gore has used in several speeches (*Science*, 12 April, p. 177). It draws on President Clinton's recently announced Internet II initiative to spend $100 million a year to bring more of society online, stimulate development of the next generation of the World Wide Web, and make what is already available more user-friendly (*Science*, 18 October, p. 335).

"The Web is a complex tangle of data and spaghetti, some deserving of our attention and some not fit for anybody," says Lane. "Out of this morass of data, how do you sort out knowledge? That capacity is intelligence." Moniz is more skeptical of KDI, however. "I've tried to understand what it entails," he says. "It focuses not on hardware but cognition, and the questions about the proper man-machine interface are interesting. But I'm not sure I know how to pursue the answers."

The third theme, Learning and Intelligent Systems, was actually begun last year by two directorates—engineering and computer science—but Lane hopes for additional money to expand it to the rest of the foundation. It's the brainchild of Joe Bordogna, former head of the engineering directorate and now acting deputy NSF director. It is hoped that the program will combine work in neuroscience and artificial intelligence with advances in robotics and automated systems for use in the classroom. NSF is offering $20 million this year to the best proposals, including real or virtual centers for collaborative research on learning technologies, and hopes to sustain the initiative in fiscal 1998. **–J.D.M.**

RESEARCH IS TRUMP UNDER LANE

Program	FY 1994	1995	1996	1997
	(in millions of dollars)			
Research activities	$2168	$2245	$2314	$2432
Education	569	606	599	619
Academic infrastructure	100	118	100	0
Major equipment	52	126	70	80
Administration	123	129	132	134

SOURCE: NSF

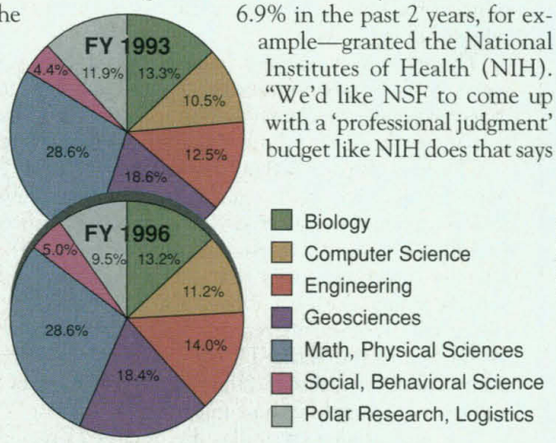
Research rules. Lane has boosted research spending despite some lean budget years for the rest of the agency.

last summer to the Arlington Rotary Club that was covered by *The Washington Post*. The idea is for scientists to spend more time discussing their work with students, neighbors, local business leaders, and politicians. "Who better to do that—to explain the value of science and technology [S&T] to the public—than the professional scientists and engineers?" he asks. The campaign also has been noticed on Capitol Hill. "He's been a leader in speaking to scientists about the factors that impact support for science," says Tom Weimer, chief aide on Schiff's research subcommittee. "He's been a good spokesman for basic science."

To not so boldly go

Some researchers who depend on NSF for their grants wonder, however, whether the agency and its supporters should be more vocal in promoting basic science. They recall that, under Bloch, NSF enjoyed double-digit annual increases as part of a pledge by Presidents Reagan and Bush to double NSF's budget over 5 years. Now, the Clinton White House is telling Lane to be happy with a flat budget. Although the political environment has changed, some observers say that shouldn't be used as an excuse for timidity. "Erich went to the White House and fought for that increase on the grounds it was important for the country," says one former NSF official. "I don't see Neal making that kind of argument."

These critics also point to the large funding increases in recent years—5.7% and 6.9% in the past 2 years, for example—granted the National Institutes of Health (NIH). "We'd like NSF to come up with a 'professional judgment' budget like NIH does that says what it would do with more money," says Howard Silver, chair of the Coalition for NSF Funding and executive director of the Consortia of Social Science Associations. "But there's not much enthusiasm for that at NSF."



Steady state. Disciplinary shares of the overall research budget have changed little during Lane's tenure.

Unfortunately, NSF lacks one of NIH's biggest assets in dealing with Congress. As Donald Langenberg, chancellor of the University of Maryland, puts it: "No congressman ever had a relative who died of multidimensional algebra." And Lane admits that NIH tops NSF in cultivating ties to influential business executives and grassroots health organizations. "There is not a similar identifiable group within business that is articulating the need for more S&T funding broadly," he says.

Nevertheless, no less a figure than Representative Lewis, who played a major role last year in obtaining an additional $40 million in research funds for NSF, urges Lane "to be bold and strike while the iron is hot" on behalf of NSF. He suggests scientists build on last year's public expressions of support for basic research from House Speaker Newt Gingrich (R–GA) and President Clinton's recent comment in *The Atlantic* magazine that "we're way underinvesting in science and technology."

Lane backs away from leading such an effort. Putting on his jersey as a member of the president's team, he says: "I don't know exactly what bolder would mean. ... It wouldn't be prudent for me to talk about budgets while they are still under discussion." But Lane promises "to get out there and continue speaking about what a mistake it would be for this country to cut S&T funding." After all, he notes, there are lots of places where NSF funds research that might appeal to a curious legislator.

–Jeffrey Mervis

U.S.–RUSSIA COLLABORATION

Travel Grants to Boost Sagging Labs

A hundred U.S. scientists will travel next year to Russia's two main nuclear weapons institutes in an effort to spur collaborative research and bolster sagging morale among weapons researchers there. But while the work should augment efforts to turn Soviet swords into plowshares, it is unlikely to be more than a stopgap measure for scientists who once enjoyed a productive and comfortable way of life but are now facing severe hardships.

The $2500 travel grants will be provided by the U.S. Civilian Research and Development Foundation (CRDF), a nonprofit agency that funds collaborations between scientists in the United States and the former Soviet Union (FSU). The money will go to U.S. scientists working on joint projects funded by a second organization for defense conversion: the International Science and Technology Center (ISTC), which so far has sustained almost 14,000 FSU weapons scientists. The ISTC, a multilateral fund coordinated by the State Department, does not provide money for U.S. scientists to visit colleagues in Russia, and so the CRDF is stepping in. The travel grants are part of a $400,000 initiative approved last week.

The program comes at a time when conditions in the two formerly closed cities, to which access is still rigidly controlled, may be at their worst. In the wake of the severe economic crisis, observers say that a gloom deeper than winter darkness has settled on the Federal Nuclear Center for Experimental Physics in Arzamas-16, now called Sarov, and the Federal Nuclear Center for Technical Physics (VNIITF) in Chelyabinsk-70, now Snezhinsk. In Soviet days, many scientists were lured to these remote facilities with promises of decent pay, housing, and schools, says Evgeny Avrorin, a physicist who will serve 2 years as VNIITF director following the suicide in October of its previous director, Vladimir Nechai. Nowadays, however, Avrorin says, obtaining even the necessities of life is a scramble. Gas and water companies commandeer federal funds intended to go for salaries, so most scientists haven't been paid since April. They and their families, once able to afford a yearly vacation, are virtual prisoners in guarded compounds whose quality of life pales in comparison to neighboring towns, says Avrorin.

The CRDF and other organizations were created as a counterweight to fears that increasingly desperate financial conditions could drive nuclear physicists to countries that sponsor terrorism or induce them to smuggle fissile material out of Russia. Avrorin says that Russian safeguards are adequate and have improved, thanks to Western technology. But he acknowledges that the risk of smuggling remains real. "People are tempted to steal," he says.

Although Avrorin welcomes the travel grants, he says they will do little to meet a government mandate that VNIITF, by 2000, earn half its revenues from outside sources. Right now, he says, the institute gets 15% of its budget from nongovernmental sources. To boost their outside funding, says CRDF executive director Gerson Sher, the institutes must change how they do their work. The Russians are peddling what they have rather than what Western companies want "because they have jobs they want to save," Sher says. He cites the development by Avrorin's institute of a new sensor to detect impurities in milk—despite the fact that the U.S. dairy industry already has sensors. Getting the institutes to become market savvy, he says, "will take some discussion and some disappointment."

–Richard Stone