NSF will experiment with fixed budgets in an effort to simplify grants process

Washington. Starting next month, mathematicians applying for support from the US National Science Foundation (NSF) will be part of an experiment intended to simplify the process by which researchers are funded, reduce the administrative burdens on both the foundation and the scientific community and increase the number of researchers receiving grants. In particular, applicants will not submit a proposed budget with their application and, if successful, will receive grants of a predetermined amount.

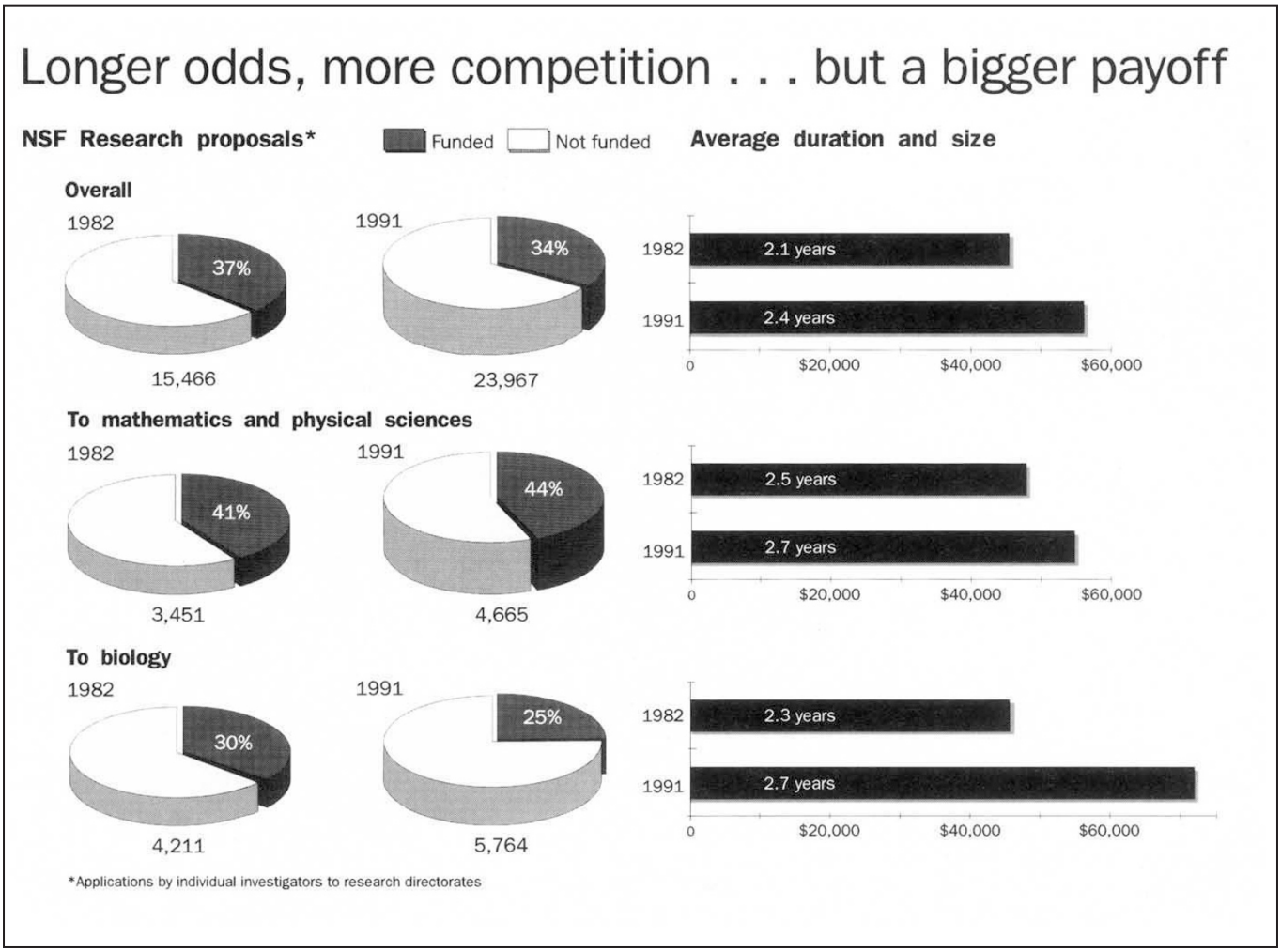
The changes address two major problems. The first is how NSF can process half again as many research proposals from individual investigators as it did a decade ago, with no increase in staff (see charts). This has created a heavier workload for both NSF employees and for those outside who must review each proposal. In addition, a declining success rate — two in three applications are rejected — means that more of those reviews will be for naught. The second problem is how to maintain the vitality of US academic research. Despite having more money, NSF is saying 'no' more often than in the past in most disciplines. And it uniformly gives those who succeed less money than they have requested.

Part of the crisis is self-generated: NSF is inviting applications for a growing portfolio of programmes covering minorities, women and young investigators as well as for special initiatives on such subjects as supercomputing, advanced materials and the environment. These typically have an even lower rate of success than does the typical research grant — a programme that intends to make a dozen awards, for example, may easily receive 200 applications. Each one, of course, must be submitted by the investigator's home institution before being processed by NSF and reviewed by as many as half-a-dozen colleagues.

The challenge for NSF is to modify its system without weakening the peer-review process that lies at its core. Although Walter Massey, the NSF director, has mused in public about the concept of a block grant — giving an institution a lump sum and letting it decide how to divide the money — no such drastic changes are being considered. At the same time, a system that can spend $10,000 to make a $30,000 award clearly stands in need of revision.

The experiment being launched next month by NSF's mathematics divisions attempts to address several aspects of the problem. The awards will be for either $20,000 or $30,000 a year depending on the quality of the research; investigators may receive $10,000 more for a graduate or postdoctoral student. The size of the grant will not be affected by an investigator's salary or the overhead costs charged by his or her university. Each of those features marks a break with tradition, in which budgets are set after individual negotiations reflecting the special circumstances of each investigator.

NSF expects to save enough money



under the new procedures to award about 20 per cent more grants. The beneficiaries will be the 120 or so mathematicians who in the past would have been turned down because of insufficient funds. The losers are the senior scientists whose grants will be trimmed to match one of the two flat rates. (An NSF grant historically pays two-ninths of a researcher's salary, on the assumption that the research is carried out during the summer term. The new grants are not intended to cover summer salary.)

"Fifteen years ago, I didn't worry about those people being turned down because they were not likely to make an important contribution", says Peter Bona, a mathematician at Pennsylvania State University and chairman of the mathematics advisory committee to NSF. "But the people being rejected today are a bit too good to ignore."

The chemistry division, according to its director, Kenneth Hancock, is considering a similar system with three tiers. The first would consist of standard grants, set at a flat rate to eliminate the need for negotiations. The second tier would provide small, starter grants to those new to the field, and the third would bestow large, long-term grants upon eminent senior researchers.

"It's a system in which a lot of people win", says Hancock. "We even found that we could fund at least as many grants as under the current scheme. The trick is that you have to sacrifice a little on the size of the average grant."

A flat rate will present investigators and their institutions with some hard choices, for example to sacrifice a higher salary for a graduate student or to spend money on travel rather than a new computer. Bona says that universities traditionally "make money" on mathematics departments because the scientists require little costly equipment or special facilities and that the new system may induce them to revise their bookkeeping and "to return some of that money" to mathematics.

The experiment, if successful, could be modified for other disciplines; in some ways, it extends efforts already under way to streamline the process. NSF officials have resolved to enforce an existing 15-page limit on grant applications, and the biology directorate has successfully used brief pre-proposals to screen applicants for multi-million-dollar training grants. The entire campaign, says Charles Brownstein, director of the office of planning and assessment, "is driven by a desire to avoid having highly qualified people become clerks".

The mathematics trial is scheduled to run for at least the 1993 fiscal year, which begins on 1 October, and possibly into 1994. Bona says the advisory committee will "be watching it like a hawk" and is prepared to make changes, or to jettison it, if there are signs that the new system is funding research of lower quality.

Jeffrey Mervis

Canadian research council found guilty of job bias

Quebec. The National Research Council (NRC) of Canada, the country's largest research and development organization, has been found guilty of racial discrimination against an Indian-born physicist and ordered to review its human rights policy towards its employees. The ruling was made by the Canadian Human Rights Tribunal in a strongly worded decision issued on 21 August that recommended prosecution of several NRC employees for violating the country's Human Rights Act.

Chander Grover

NRC says that it is "surprised and shocked" by what is believed to be the first such investigation involving the council. Yet it seems unlikely to be the last. The complainant, Chander P. Grover, who arrived in Canada in 1978, claims that he was harassed by NRC even after the tribunal published its decision. Grover has made two further complaints that are being investigated by the Canadian Human Rights Commission, and has submitted two related grievances to the Public Service Staff Relations Board. A similar complaint — on the same grounds and against the same group of people at NRC — has also been submitted to the Human Rights Commission office by a former colleague of Grover's, Chinese physicist Tony Liu. A ruling is expected within the next few months.

The Canadian Human Rights Commission was established by the federal government in 1977 to investigate and resolve complaints of discrimination on such grounds as race, origin, religion, sex, age and disability. By last year it had more than 2,500 cases pending, 10 per cent claiming discrimination because of race and 12 per cent because of national origin.

Grover alleged that he was denied managerial, promotional and research opportunities in a series of incidents between September 1986 and August 1987. He works in the physics division at the NRC in Ottawa, and claimed discrimination on the basis of race, colour and national origin. In 1987 there were no visibly minority scientists within the senior management of the physics division.

After receiving degrees from the universities of Delhi and Paris VI and acquiring extensive research experience, Grover joined NRC in 1981 as an associate research professor within the physics division, and, according to a previous director, "quickly became our leading expert in modern optics... his research work has brought him national as well as international recognition...".

In 1985 he became acting director of a new optics institute within the NRC that later became an independent National Optics Institute. He was appointed interim scientific director of the new institute, located in Quebec City, but in January 1987 turned down an offer to take the job on a permanent basis.

Grover's superiors then attacked his reputation, reduced his research activities, dismantled his research team, withheld his funding and left his future with the NRC uncertain, according to the tribunal. At one point, he was told he was being dismissed for disciplinary reasons, but the action was reversed the day before a staff hearing into his complaint.

In its 94-page decision, the tribunal found NRC's actions "flagrant and calculated to humiliate and demean the Complainant" and the cause of health problems for Grover and his family. NRC's own human rights adviser played a role in the debacle, the tribunal said: "After receiving in confidence Dr Grover's entire story about the complaints of his treatment...[she] then turns about and becomes the representative of the National Research Council throughout these complaints and the subsequent hearing". From the beginning of Grover's complaints to the last day of the hearing, the tribunal found, "NRC endeavoured to apply pressure on witnesses as well as control and prevent the introduction of some of the evidence".

NRC's treatment of Grover restricted his international activities and harmed his career. A last-minute cancellation of a trip to present a paper at a meeting in Boston of the Optical Society of America, to which he had recently been elected a fellow, "was professionally a great embarrassment for Dr Grover".

The tribunal called for a formal written apology to Grover from NRC's president within 15 days, to be published in an NRC publication, and an apology from the NRC president to the optical society. It ordered NRC to appoint Grover to at least a position of section head, to pay him lost wages, to cease its discrimination against him and to pay his legal fees and $5,000 for emotional distress (the maximum allowed), including interest.

NRC is considering an appeal but has otherwise refrained from comment. It has 30 days to file an appeal, which would be heard by a division of Justice Department.

David Spurgeon