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NEWS AND COMMENT

Money for Science: The Community Is Beginning to Hurt

There is a tendency among some scientists to equate the refusal of a grant with the persecution of Galileo. Thus, when research, like most wards of the federal treasury, must make a tithe to the Vietnam war, faculty club chatter often seems to suggest that science is going the way of Studebaker. Of course it isn't. In fact, the research community is bigger and richer than ever. But the demands of Vietnam dictate that the country cannot have guns and paté de foie gras. One consequence is that, while the research community is bigger, it is only slightly richer, and the disparity between size and support appears to be squeezing and, in some cases, stranding an indeterminate but possibly significant number of researchers.

Just what effect this is actually having on the condition and progress of American science is difficult to establish. The base line for doleful prognostication is high in the best of times. Furthermore, when it comes to specific cases, disappointed applicants usually prefer not to advertise their lack of success. Nevertheless, there are now innumerable indications of financial strains throughout the scientific community. Through two decades of training and construction programs, the federal government has created a vast population of consumers of research support, all imbued with the spirit of rising expectations. But now, because of the drain of the Vietnam war and the Johnson administration's order of priorities, apparently not enough federal money is being provided to support all their aspirations. And, as a result, some researchers are being left out altogether, while others are beginning to experience the scale of professional living normally associated with the English department.

In general, the impact is said to be greatest among young scientists seeking money for equipment and salary to undertake their first independent investigations. But there is no dearth of long-supported senior researchers who, for the first time in their postdoctoral careers, are finding it hard to get the amounts they desire to underwrite their work.

Since the scientific enterprise in this country is so vast, and the means of supporting it are so diversified among a highly balkanized array of federal programs as well as private and state sources, there is no readily attainable comprehensive assessment of what is happening. But on the basis of inquiries among scientists and administrators from some 20 large and small, public and private, institutions throughout the country, there emerges a picture that looks like this.

At virtually every institution, there is considerable concern about the adequacy of funds for maintaining existing basic research programs or for carrying through with expansion programs now under way. This does not mean, however, that laboratories are being padlocked or that existing or planned programs are tapering off. Rather, it does mean that researchers, department heads, and deans are going through a laborious process of realigning priorities and seeking new sources of support. At one major middle-Atlantic institution, the financial gap caused by the refusal of a grant renewal was partially made up by laying off two technicians, who are reported to have found satisfactory employment elsewhere. The departure of the two adds to the workload of those who remain, but the rejected grantee is still in the laboratory, more or less carrying on with his project.

At a major northeastern institution, some $70,000 was unsuccessfully sought from a federal agency for equipment for a newly arrived physical chemist. The department chairman now expects that the university will provide a good deal of the money out of its own resources and that private foundations will make up the difference. But in terms of long-term planning for the department, the experience has a bearish effect and does not encourage a continuation of the well-established practice of attracting bright young faculty members with the assurance that a federal grant will support their work.

At a small, private medical school, basic research funds are in short supply, but the school recently received a large federal contract for what is supposed to be strictly an applied research project. Nevertheless, the intricacies of bookkeeping and the time-honored

practice of bootlegged research assure that some of the money will trickle into basic research.

At a major midwest state university, a senior researcher in chemistry was cut off after many years of grant renewals. The injury to professional pride was painful, but a state agency has picked up the bill and his work goes on pretty much as before.

However, at a rapidly expanding but still relatively small state institution, a recently hired young researcher with impressive credentials has been unable to obtain any support and is simply working with books while hoping that still-pending applications will provide support for laboratory work. Situations of this type are said to be no rarity at universities that are seeking a rapid route to growth and quality. In well-established institutions, with equipment accumulated over the years, the newcomers often can borrow or improvise apparatus while waiting for the splendid new equipment that they consider desirable. But in newly established or rapidly expanding institutions there is often little or nothing to fall back on when the news from Washington is bad. However, the prevalence of this situation is difficult to determine, and in many instances the report is that, by one means or another, something is usually patched together to sustain a reasonable level of research activity. (A department head who is said to have informed and gloomy views of the situation was unavailable, having just gone abroad for a professional meeting.)

Difficulties Delayed

One conclusion that might be drawn from the available information is that, when all the national resources for research are added up, there is at this point a comfortable amount of fat in the system, and that generally it keeps things going when specific dislocations occur. This is no comfort at all for the individual who is dislocated and unable to tap alternative sources of support. And it appears relatively certain that, if the rate of financial growth does not pick up, the fat will be exhausted in a relatively few years and research may then widely experience the economic recession that has already struck at a number of places.

For the short run, however, when it comes to research, the Executive and Congress deal with gross systems rather than individual cases. At this stage of the postwar science-government relationship there is no mileage in pleading that the rejected grantee might be just the man who will cure cancer. In fact, one strand of political feeling that now seems to be developing toward federal support of basic research is reminiscent of what John Wanamaker is reputed to have said of his advertising budget—namely, he knows that 50 percent is wasted, but he doesn't know which 50 percent. The scientists are worried about the present situation, but few politicians share their vision of crisis.

The sources of the current financial distress can be traced to the pressures that the Vietnam war is exerting on the entire federal budget. But there is a peculiar set of circumstances that make technical activities, whether in the aerospace industry or university laboratories, unusually vulnerable to the vagaries of federal policy. Since World War II, these activities have to a large extent come into existence as a consequence of federal decisions underwritten by federal money. To use the late Charlie Wilson's unfelicitous term, there is now a vast community of "kennel dogs," bred, born, and trained to function in an economic system that is largely sheltered from conventional supply and demand forces. When the public process cranks out support for them, they are able to engage in the work for which they trained. But when the support does not keep pace with their growing numbers, there are no assured alternative means for filling the gap on a continuing long-term basis. As one university administrator long involved in NSF policy affairs recently remarked, the federal agencies, in effect, produce scientists the way West Point produces Army officers. But once having prepared them for a scientific career, the agencies can offer no assurance that competent performance will automatically bring the opportunity to pursue the career, at least at federal expense. It might be added that, as a matter of practice, federal programs have generally been sufficiently well funded to support a generous proportion of qualified researchers, but this has been the result more of a mixture of good luck and Cold War excitement than solidly established national policy.

The makings of the present situation are apparent in the statistics of the federal agencies that have become the financial mainstay of basic research. For example, since 1962 the Sustaining University Program of the National Aeronautics and Space Administration has annually helped produce ever-larger appetites for financial support on campuses across the country. The research facilities grants portion of the program started out with a total of $6.5 million, rose to a high of $11.5 million in 1964, and now is projected at $7 million for the coming fiscal year. Grants to support research inside those facilities, and elsewhere, started at $4.5 million, rose to a high of $13 million in the current year, but will drop to $12 million next year. Meanwhile, NASA's training grants program will decline slightly—from $25 million this year to $22 million next year—but it still is going at a level designed to turn out 1000 new Ph.D.'s a year by 1968—and it is reasonable to expect that a lot of them will seek funds to do the research for which government funds trained them.

Decline in Percentage

Figures now being worked up at the National Institutes of Health show a steady decline over the past 4 years in the percentage of scientifically approved grant applications which are actually funded. Of those that are funded, the amount of money provided, as compared with the amount requested, has also been dropping. Over the same period there has also been a sharp increase in requests for renewals of grants. The support system is, of course, vulnerable to various manipulations and ploys by researchers seeking hedges against budget cutting, but one cannot help but get the impression that a lot of people are actually beginning to hurt.

So far, the most pronounced reaction to this situation was a resolution adopted in April by the American Society of Biological Chemists. Addressed "To Those Responsible for Federal Policy Concerning Support of Fundamental Research," it particularly emphasized the plight of young researchers and suggested that:

> If it should become a matter of national policy, for whatever reasons, to fix the size of the National research enterprise at some pre-determined level, such decision must be made years in advance and implemented by careful limitation of the numbers of young people entering this long and expensive training. Abrupt changes in the pattern of funding must, otherwise, result in serious waste of highly trained and talented young scientists.

There is no evidence that the addressees were in any way moved by this desperate-sounding resolution. In large part this is because it is a good question who is "responsible for federal policy concerning support of fundamental research." There are lots of proposals, reports, and notions floating around, but if there is any sort of comprehensive and governing policy, it is well concealed among the plethora of agencies, congressional committees, institutions, statesmen, and would-be statesmen who crowd the arena of science and public affairs. Easily won success and traditional aloofness from politics have accounted for the scientists' traditional reluctance to join the scrap for a share of public largess. But now that the scientific community is beginning to hurt, perhaps it will conclude that eloquence and resolutions addressed to the wind are not sufficient.

—D. S. GREENBERG

Goddard at FDA: New Rules for the Game

In the 5 months in which he has been commissioner of the Food and Drug Administration, James L. Goddard has instituted regulatory action against many major drug companies, overturned the philosophy on which his predecessors based drug regulation, and given a substantial push to efforts to sharpen the agency's scientific capabilities. He has also brought the agency into the public eye, and elevated its status within the executive branch of government, which has tended in the past to ignore its existence and downgrade its importance. "We're *there*," commented a Goddard aide, "and now they know it." It is far too early to know whether Goddard has merely pulled off a reversible coup d'etat or institutionalized a permanent revolution. Dissidents are already whispering—and the drug industry is plainly hoping—that Goddard is more concerned with changing the "image" than with changing the reality. Jealousies within the world of Washington health politics and possible political curbs on Goddard's attacks on industry raise further questions about how far the new commissioner will go. But whatever the future holds, Goddard has already accomplished at least one bureaucratic miracle: FDA these days is where the action is.

What Goddard has done, first, is to change the rules of the game by which drug regulation is played. Rule number one, in the old regime of George Larrick, FDA commissioner for 11 years, was public obeisance to a kind of credo: "Most of the drug industry is honest and incorruptible; excesses are committed only by an undisciplined few who are not really in the family." It is a notion that the new commissioner frankly scorns. He loses few chances to stress that what he terms "the disease of irresponsibility" runs straight through the industry and involves its most prominent leaders. His regulatory actions—including moves against Warner-Chilcott, Parke-Davis, Pfizer, Burroughs Wellcome, Hoffman-LaRoche, Lederle, and others—carry the same message.

Industry's public reaction to this aspect of Goddard's activities has so far been a somewhat dazed repetition of the old saws. In a recent speech to the Pharmaceutical Manufacturers Association, for example, Goddard went out of his way to point out that he had complaints against the advertisements of one-third of PMA's member firms (*Science*, 15 April). PMA president Joseph Stetler reached for the old formula. Goddard's remarks "might unfortunately be interpreted as an indictment of the entire drug industry because of its overemphasis on isolated instances without acknowledging the integrity and responsibility which our industry has consistently demonstrated," Stetler said. Industry's private reaction does not carry quite the same conviction. There is abundant speculation about the nature and motives of the man, somewhat reminiscent of the way college students, among themselves, discuss professors, and a kind of uneasy feeling among the discussants that they do not yet have his full measure. In at least some sections of the industry there is an unwillingness to believe that Goddard really means what he's been saying, and a tendency to expect that he will slow down his attacks. This expectation, together with industry optimism that Goddard will make good his promises to speed up the agency's processes for reviewing new-drug applications and modernize its information system, probably accounts for the fact that criticism of the new commissioner has been relatively restrained. They like his science; his politics has them worried.

Another rule of the old game, more important than the first, was that the Food and Drug Administration should interfere as little as possible in the relations between drug manufacturers and physicians. The rule has deep roots in the traditions of American medicine—belief in the autonomy of doctors and in the competence of solo practitioners to make their own decisions about therapy, belief that government restrictions constitute tampering with "the doctor-patient relationship." But it also has roots in the economic self-interest of the companies, who can sometimes persuade practitioners of the value of remedies which independent research has discredited. A case in point is that of the cold-preparations containing antibiotics, which Goddard recently ordered off the market in an action that may decrease pharmaceutical sales by as much as $25 million annually. Competent researchers familiar with the action of antibiotics have long said they were useless against colds; practitioners—and the public—have gone on depending on them (*Science*, 30 August 1963). There are also more subtle examples—case after case where industry advertising seeks to establish broader use for a product than clinical evidence justifies, and frequently succeeds.

The proper role of the FDA in controlling pharmaceutical products that