Developments in Federal Policy Toward University Research

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I will start with a point which is, I hope, not too indelicate: money.

That money is now a good deal tighter in many government research programs than their beneficiaries would like will come as no surprise, and the reasons are evident—the war in Vietnam, the war in our cities, and the difficulty, in any event, of maintaining exponential rates of growth. HEW Secretary John Gardner has dismissed the 30-percent annual growth rate attained by NIH budgets from 1954–64 as "neither warranted nor tenable" at the present budgetary level of $1.3 billion; and he has even questioned the need for a 15-percent annual growth rate in government expenditures for university research advocated by the President's Science Adviser and the Committee on Science and Public Policy of the National Academy of Sciences, and accepted as a general policy target by the Bureau of the Budget for the past 2 years. "I have not yet encountered the thorough economic analysis that one might expect to lie behind such a widely quoted figure," Gardner has informed a group of NIH consultants, asking that the "necessary rate of growth" be determined "with the same thoroughness and objectivity that we expend on other important matters in the field of science" (*1*).

But it is difficult, at best, to conduct with disinterest and dispassion an analysis that so vitally affects one's own interests; this is more than should be expected of mortal, if scientific, flesh. It is, therefore, entirely right and proper that intruders from other fields and functions—economists, university presidents, business officers, even (the final test of fortitude) deans—should participate in the analysis, and that relatively disinterested bodies such as the Bureau of the Budget and the Congress should play so important a part in the decisions that emerge. I would like sometime to impanel a group of scientists' wives (or, to allow for the Mary Buntings and Mina Reeses, spouses)—let us say, those of Nobel laureates, members of the President's Science Advisory Committee or the National Science Board—have them briefed together with their spouses, and see just what scientific allocations would emerge. Could such lay allocations be any less rational and more adventitious or political than those under which science now prospers?

I suppose that is one burden of my remarks—that, despite the cries of alarm rising from faculty bars, transcontinental planes, and the cafeteria of the National Academy of Sciences, science is still prospering. Neither the reduced rate of growth in expenditures nor the greater government effort to utilize basic research findings can reasonably be construed as an assault on basic research, and the fact that many eminent scientists imagine the opposite attests only to the enormity of their aspirations and illusions. After all, great imagination is a great asset in scientific work; but it is not so great an asset in budgetary justifications (or there would be fewer bureaucrats and more artists in Washington).

A Rainbow-like Prospect

Now, was it the bureaucrat or the dreamer in Alan Waterman that led him to declare, in 1961, that the budget of the National Science Foundation should grow "at an average rate of about 35 percent per year for the next 10 years"—which would have brought it to $5.3 billion in 1971; and what was it that, in 1963, led Philip Handler and Frederick Seitz, apparently independently, not to shudder and recoil from the horror, but happily to envisage that, by the end of the century, the nation might devote to research and development as much as half of its gross national product? (*2*) (This rainbow-like prospect, with a very considerable pot of gold where the sky meets the ground, was arrived at simply enough by projecting approximately the rate of growth then prevailing in R & D expenditures.)

A similar dream has been voiced in many different ways by the leaders of many different scientific agencies and fields. It is, of course, a dream of glory and, standing modestly beside the glory, power. As Einstein once observed, "If an angel were sent by God to drive out of the temple of science all those people [in it for reasons other than their love of the truth], it would become embarrassingly empty. . . ." (*3*).

As a further example, I will cite only the defense offered by high energy physicists of the vital importance of their dearly (and I mean dearly) desired 200 BEV not just to physics, but to the nation. To Païs, this great machine represents not just a triumph for physics, but "a source of inspiration for new science and a monument to our days" (which is to say, a pyramid); to Feinberg, it represents "the best single element we have contributed to human culture" (which, if true, is a terrible indictment of our society); and, to Oppenheimer, "a triumph of human reason. . ." (*4*). (Not "human capital." In what respect, I wonder, does reason enter more into the construction of an accelerator than the construction of a library or a hospital?) Finally, for Victor Weisskopf (*5*):

> The value of fundamental research does not lie only in the ideas it produces. There is more to it. It affects the whole intellectual life of a nation by determining its way of thinking and the standards by which actions and intellectual production are judged. If science is highly regarded and if the importance of being concerned with the most up-to-date problems of fundamental research is recognized, then a spiritual climate is created which influences all other activities.

So we are to build this expensive machine because of the spiritual climate it creates. (Others may prefer the climate of Nantucket, Pittsburgh, Broadway, or the church.)

Now, I submit, basic science today faces not "Another Appalachia," as the president of the American Geophysical Union fears (*6*), or what Dael Wolfle recently characterized as "a serious flaw in the American commitment to science" (*7*), but, rather, the momentary puncturing of a dream—momentary because dream stuff is presumably self-sealing. Reality has penetrated painfully

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with the realization that, in Gardner's words, "Among all human enterprises . . . research [Gardner referred specifically to 'bio-medical research,' but the point can be extended] cannot hope to have the unique attribute of existing in a world without resource constraints" (*1*).

Surely the dream contained, as all dreams do, elements of reality—that *some* science has proved of great benefit to man—as well as elements of utopia (or, if you prefer, nobility): that man might love the truth for its own sake, and nothing but the truth, and the truth would make him free of at least some of his follies and vices (enough would remain, in any event, to sustain him). But these elements have been obscured by clouds of rhetoric, vanity, naivete, self-interest, and self-deception.

Reasserting Standards of Quality

I take little comfort in the ill winds that blow from Vietnam; but if they bring to science less money than had been anticipated, they bring some good as well. Above all, they bring an opportunity if not to reestablish, then to reassert standards of research quality that have been lowered by too much money. It is hard to recall that 11 years ago, a distinguished scientific committee chaired by C. N. H. Long of Yale (the first deputy head of the Office of Science and Technology, Colin MacLeod, was also a member) asked if, particularly in areas with extensive private support like cancer and heart disease, ". . . available facilities and manpower . . . are not nearing the point where most worthwhile [research] programs are now being supported?" (*8*). (To be sure, more facilities have been built and more scientists have been graduated in the interim.) It is even harder to believe that the committee "was informed by the representatives of NIH that, in general, the present level of support of the intramural programs of all Institutes except those of Microbiology and of Dental Research is adequate, provided no further inflation occurs, and no unusual emergencies arise" (*8*, p. 22). (As we know, the ensuing decade was fraught with inflation and with an unusual number of unusual emergencies.) Granted, this piece of infamy was perpetrated by one Republican secretary of HEW, who preceded another Republican secretary who helped to launch NIH into its present financial orbit. But was it so different, in substance, from Jerome Wiesner's acknowledgment, in 1963, that "the National Institutes of Health and the National Science Foundation support research that in a tighter economy you would not support. . . . [The] agencies would agree that they are supporting not only the unusual scientist . . . but . . . the average person as well. And they are doing this deliberately" (*9*).

I know that the Wooldridge investigation, a pioneering exploration whose success was comparable to that of Scott's Antarctic expedition, discovered that the quality of most biomedical research was the best that was possible in the best of all possible worlds. It thus disposed for all time of such boorish charges as those of Paul Weiss about the existence of "much shoddy, inconsequential, redundant, uncritical, and ill-conceived research, the mainsprings of which may have been nothing more than that 'soft money' was available to support it. . ." (*10*) or those of John Cockcroft, A. H. Halsey, and Ingvar Svennilson, the three OECD examiners of our national policies for science and education, who noted "a widespread impression that the second-line institutions tend to expand their graduate output to some extent at the cost of producing mindless and ritualistic research—what Sir Eric Ashby has called 'crawling along the frontiers of knowledge with a hand lens'" (*11*). The Wooldridge report would have been even more persuasive if there had been closer agreement between the committee's findings and those of the panels upon which they were supposedly based; and, in general, if there were greater consistency between the contention of government granting agencies that quality or "excellence" is the primary criterion in project awards and their equally common contention that they do and should support research which is merely "competent" (an entirely democratic and politic principle that has, in the past, contributed much to the rise in basic research budgets). Indeed, discussing this matter not long ago with a senior official of an important agency, who knew full well that expanded budgets tended to produce work of lower average quality, I was somewhat taken aback when he remarked—and this is a verbatim, honest quotation—"I am working feverishly to *reduce* the quality level."

Unfortunately, his work and that of his colleagues in and out of government has been all too successful, so that, given present pressures for a broader geographic distribution of research funds (why is it that congressmen from the Midwest do not work with equal fervor for a broader distribution of agricultural subsidies?), there is real danger that the average quality of basic research grants may decline in lean years as well as in fat. Anyway, some Cambridge people are genuinely concerned about this danger, and I share some, but not all, of their concern. (It is entertaining but, to a Yale alumnus, hardly novel to conceive of Cambridge as a culturally deprived area.)

This Is Not Nazi Germany

Let me turn from this depressing theme to a more cheerful one. At any rate, I take cheer in it, though some professors will not. I refer to the Surgeon General's order that any work involving the use of human subjects must first be scrutinized to see that the rights and interests of the subjects are protected. To my mind, this order is entirely praiseworthy. Perhaps I have been living in Washington too long, but, I must confess, it surprised me, because I did not really expect the government to react so quickly and pointedly to the atrocious episode of cancer experimentation in New York, and other cases such as those that Henry Beecher has documented (*12*). All that the Surgeon General has done is to affirm what should never have become necessary—and the more imperious members of the scientific community should ask themselves why it became necessary—for him to affirm: that this is not Nazi Germany. As he told the April meeting of the American Federation for Clinical Research (*13*):

> Existing law is firm and clear on one principle: that the decision to become a subject for research must be made by the subject . . . . The principle involved is the same one that condemns slavery and underlay the judgments at Nuremberg . . . . The American people accept health as an important value. They have accepted research as an important means of achieving it. But values of human dignity and individual conscience are held higher still. We overlook them at our gravest peril

. . . . It is quite possible that some important research will be delayed or perhaps lost. But . . . the problem must be faced—not only for the sake of the public but for the future of research itself.

Now that legislation has been passed to protect the interests of animals traded for research purposes, it is good to see the government turn its attention to human beings.

I asked a couple of knowledgeable Public Health Service officials how the ruling was being received by the universities, and they said, very well indeed; there had been some criticism of the cumbersomeness of the initial requirement for the certification of each project, but the revised regulation permitting institutions to give a single, comprehensive assurance that all research would be screened had taken care of the difficulty. This impression agrees with that of several private sources in close touch with universities throughout the country.

Nonetheless, I suspect that the dust has yet to rise on many campuses, and that it will be a good many years before a workable solution is found for the many difficult practical and moral problems that have now been posed. For example, the regulation covers psychological and social as well as biomedical research. Social scientists are already deeply troubled at congressional inquiries into real or potential invasions of privacy and threats to individual rights involved in the use of lie detectors, personality tests, and proposals for a national data bank that might (critics allege) be converted into a government dossier on each individual. Much overseas social research has been brought to a standstill as a consequence of the Army-Camelot and the CIA-Michigan State incidents; and the State Department is now clearing (which means, in some cases, stopping) proposed foreign area research sponsored by military and foreign affairs agencies. In this situation, many social scientists cannot greet with enthusiasm what they, rightly or wrongly (I think wrongly), regard as further government encroachment on their freedom. The psychological, sociological, and anthropological associations have been particularly exercised about the foregoing developments; and, as it happens, these three fields are among the social sciences most heavily supported by PHS funds.

Nor will complaints be confined to social scientists. Viewed in long-term perspective, the Surgeon General's order is only another in a series of necessary but politically delicate steps that have been taken over the years (and particularly in recent years) to improve the quality and responsibility of academic administration. But good academic administration is an art whose successful performance makes a Barnum & Bailey act on the high trapeze seem hopelessly clumsy. Therefore, though the PHS has had a favorable initial response from medical deans, I am prepared to bet that it has not heard the last from university faculty—or presidents (*14*).

The Torturous Process of Judgment

While attempting to cultivate a sense of responsibility among the schools, the PHS cannot, of course, avoid bearing its own share of the burden. Some form of guidance will have to be given; scientists at schools that are too lax will have to be warned, while those at schools which are too strict will have to be afforded an avenue of appeal to higher authority. In Washington, as well as on campus, there can be no escaping the torturous and fallible process of human judgment, of balancing a possible gain in knowledge against a possible loss in mercy or respect for our fellow men.

What is likely to happen may resemble, in certain respects, the government's experience in attempting to deal with the conflict of interest problem among university faculty. The Atomic Energy Commission took the initiative on that matter in 1963. Some pretty awful cases had come to light. In one, as I understand it, a scientist first helped the Atomic Energy Commission to prepare specifications for an invitation to bid, and then helped a company to prepare its bid (receiving a fee for his helpfulness from both parties). Not unnaturally, the company got the contract; also, not unnaturally, when they found out what had happened, the competing companies did not like it—nor did the Joint Committee on Atomic Energy. Under pressure, the Commission issued an order requiring persons receiving half or more of their salary from the AEC to disclose in advance the consulting work they proposed to undertake, and to accept the Commission's judgment of its propriety. This order affected most of the professional staff at large nuclear laboratories operated under contract for the AEC by such universities as California, Stanford, Iowa State, Chicago, Princeton, and the members of Associated Universities, Inc. Some universities were so outraged—threatening even to terminate their contracts—that, apparently, the order has never been enforced. (I am *not* suggesting that this will be true of the Surgeon General's order.)

But the conflict of interest problem was not, of course, confined to the AEC. It had been encountered by the Department of Defense and most other agencies sponsoring university research. Accordingly, a proliferation of regulations by different agencies to deal with the same problem, the same institutions and, in many cases, the same scientists, appeared imminent. At this stage, the Office of Science and Technology stepped forward to see if a nonproliferation agreement could be worked out that would be satisfactory both to the universities and to the government. Initial discussions were held between OST and the American Council on Education, and, later, the American Association of University Professors was also brought in, so that the resultant code would represent the views of faculty as well as of administrators. The final statement, "On Preventing Conflicts of Interest in Government-Sponsored Research at Universities," released in December 1964 jointly by the Council and the AAUP (with the government, in the person of OST, discretely absent) is now in the infinitely tedious process of being discussed and adopted or adapted by faculty and administrators throughout the country.

The key to this code, like that of the PHS order, is the assumption by the university of responsibility to know what its faculty propose to do, and to make an independent evaluation of its propriety; and, of course, the assumption by faculty of a degree of responsibility not just to their own conscience and to their profession but to the larger public interest (as mediated by a number of persons with no direct interest in their work). Such a code asserts clumsily what the poet Donne said with grace, that "No man is an *Iland,* intire of it selfe; every man is a peece of the *Continent,* a part of the *maine.* . . ." Those scientists who are more interested in the truth than in their fellow men for whose sake the

truth is sought inhabit such an island which has parted from the main, and their medical research can readily become as gruesome as that practiced on Wells's *The Island of Doctor Moreau.*

In a recent article, Lewis Feuer indicts his colleagues and Chancellor Heyns at Berkeley for failing to discharge this larger responsibility (*15*):

> . . . the problem of Berkeley is the problem of the American intellectual class. As it grows in power and numbers, wooed alike by the government, foundations, the publishing world, industry, and the universities, it demands for itself the privileges and prerogatives of a third chamber of government. It demands that governmental officials be especially accountable to it as the guardians of intellect and knowledge. Yet it has scarcely shown itself to possess the character which its pretensions would require.
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> The twentieth century has shown how the intellectual class can become a primary force for an assault on democratic institutions, and we may yet witness this phenomenon in America . . . . Bernard Shaw remarks that the most tragic thing in the world is a man of genius who is not also a man of character. This . . . has been the collective tragedy of Berkeley.

I do not know if Feuer is right or wrong about Berkeley, but let us hope that, in the years ahead, the faculty of other universities demonstrate that he is wrong about them.

Congressional Bird Dogs

As noted earlier, the Congress has been paying increased attention to the social sciences of late, and it will without question continue to do so, at least for a while. Some significant and sensitive issues have thereby been raised, such as which agencies should sponsor foreign area research; the threat to privacy that may be posed by various tests—as well as by the computer; the meaning and practicality of obtaining "informed consent" (especially when children are involved) in certain kinds of psychological and social research; and related problems of research ethics. A good congressman has the instincts of a bird dog which can sniff out its quarry amidst the dense camouflage of bureaucratic and professional verbiage. No doubt, congressional bird hunts will produce some dead birds; in the course of stopping some kinds of research that should be stopped, other research that should continue may suffer. But a good bird dog does not kill; he holds the bird unharmed in his jaws.

This point should be emphasized, because the present mood of the Congress toward the social sciences is *not* primarily punitive. Congress is *not* reenacting the script of the first postwar decade when hostility, scorn, or, at best, skepticism toward the social sciences was evidenced in the hearings on the proposed National Science Foundation, and in the Cox and Reece investigations into the activities of private foundations. Quite the contrary. In the inquiries that Congressmen Daddario and Fascell, Senator Harris and Congressman Reuss have chaired, and the bills which the first three and Senator Nelson have introduced, it is clear that, for two basic reasons, the Congress is, at present, quite sympathetic to the social sciences. These reasons are a feeling that, compared to the massive government expenditures in other sciences, the social sciences have been relatively neglected; and a hope that they may contribute to the solution of the domestic problems with which this society is so visibly and inescapably confronted. And, in some ways, the civil problems of an affluent society can be more distressing than those of an impoverished society, because a poor nation can attribute its troubles to a lack of economic resources, but in a rich nation something else must be missing, some less readily identifiable and perhaps less eradicable flaw of a historical, social, or moral character. Fundamentally, the new interest in the social sciences stems, I believe, from a hope that, if they cannot cure, they may at least define the parameters and diagnose the causes of a social malaise manifest in campus uprisings, cruelty and prurience in the arts, violence in the streets, hatred in both the radical right and left, and that inner anxiety and discontent which is all the more difficult to treat because it makes no outward show. Will we learn more about it by expanding the activities and representation of the social sciences in the National Academy of Sciences, in the National Science Foundation or a new National Social Science Foundation, and in the several offices of the President?

The Congress—which is to say, the American people—may well be expecting too much of the social sciences at this juncture, as a patient may expect too much of his doctor. Was it Franklin who said, "God heals, and the doctor collects the fee"? But if, God willing, our nation can heal itself of its domestic ailments, who will begrudge the social scientist his fee?

References and Notes

1. J. Gardner, remarks at a meeting of consultants, National Institutes of Health, 23 Aug. 1966.
2. See letter of A. Waterman, in *Federal Budgeting for Research and Development* (hearings before the Subcommittee on Reorganization and International Organizations of the Committee on Government Operations, U.S. Senate, 87th Congress, session 1); Agency Coordination Study, 26 and 27 July 1961, pt. 2 (1962), p. 257; P. Handler, testimony in *Independent Offices Appropriations, 1964* [hearings before the subcommittee of the Committee on Appropriations, U.S. Senate, 88th Congress, session 1 (1963), p. 857]; F. Seitz, *Phys. Today* **16**, No. 12, 29 (1963).
3. Quoted in *Society for Social Responsibility in Science Newsletter*, p. 8 (Jan. 1953).
4. *Nature of Matter, Purposes of High Energy Physics*, L. C. L. Yuan, Ed. (Brookhaven National Laboratory, Upton, N.Y., 1965), pp. 17, 15, 5. Compare Montaigne, *Essays*, Trechmann, Trans. (Oxford Univ. Press, New York, new ed. 1946): "Reason . . . is their touchstone in all kinds of experiments; but it is indeed a touchstone full of falsity, error, weakness and impotence. . . . I always call by the name of Reason that semblance of it which every man imagines himself to possess. This kind of reason, which may have a hundred counterparts around one and the same subject, all opposed to each other, is an implement of lead and wax, that may be bent and stretched and adapted to any bias and any measure; it needs but the skill to mould it."
5. V. Weisskopf, *Bull. At. Sci.* **21**, No. 4, 8 (1965).
6. G. P. Woollard, *Trans. Amer. Geophys. Union* **46**, 633 (1965).
7. D. Wolfle, *Science* **153**, 1339 (1966). See also J. Lederberg: "[We] now seem to be backsliding in public support for science. . . . Some of my colleagues fear that hard-won advances in support of basic research and higher education are in jeopardy" (Washington *Post*, 9 Oct. 1966).
8. *Medical Research Activities of the Department of Health, Education and Welfare* (report of the Special Committee on Medical Research appointed by the National Science Foundation at the request of the Secretary of Health, Education and Welfare, Dec. 1955), p. 43.
9. See *Independent Offices Appropriations, 1964* (hearings before the subcommittee of the Committee on Appropriations, U.S. Senate, 88th Congress, session 1, 1963), pt. 1, p. 549.
10. *Daedalus* **93**, 1210 (1964).
11. *Higher Education and the Demand for Scientific Manpower in the United States* (Organization for Economic Cooperation and Development, Paris, 1963), p. 52.
12. H. K. Beecher, *New Engl. J. Med.* **274**, 1354 (1966).
13. W. H. Stewart, "The Relationship of the Federal Government to Clinical Research," talk presented before the American Federation for Clinical Research, Atlantic City, N.J., 20 Apr. 1966.
14. The board of the American Psychological Association has since asked the Surgeon General to postpone the application of his order to "non-medical settings until more workable alternatives can be developed." The American Sociological Association and the Society for the Study of Social Problems both have also called for improved review procedures to enhance the freedom of investigators engaged in social research, while retaining any needed protection of subjects.
15. L. Feuer, *Atlantic Monthly* **218**, No. 3, 87 (1966).