Onward the Management of Science: The Wooldridge Report

NIH was not cleared on all counts by the Wooldridge Committee, which itself is rated low on methodology.

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After a year's survey of the research and management operations of the National Institutes of Health, a White House–appointed committee, chaired by Dean E. Wooldridge, reported to the President that (i) the scientific activities of the National Institutes of Health "are essentially sound" and that the public is getting its money's worth for the approximately $1 billion a year now spent through NIH; (ii) the *organization* and *procedures* of NIH must be changed in order to avert "substantial problems" in the future.

The Wooldridge report ["Biomedical Science and its Administration: A Study of the National Institutes of Health" (report to the President, February 1965)] was represented to be an effort to bring dispassionate, professional judgments to bear on questions pertaining to the future of NIH. The report is singularly free of the marketplace tone and stridencies of some reports to the public on health matters. In itself, this is a great gain. The substantive recommendations, however, while impressive, are likely to provoke spirited challenges. This, too, is wholesome, for progress is promoted by open, constructive dissent.

The substantive findings and recommendations of the Wooldridge Committee and its panels are discussed here, but they are, in a sense, of secondary importance. The larger question explored is whether the operation of the Wooldridge Committee itself should be taken as a suitable model for the conduct of future assessments of federal science operations. The President's Science Adviser and personnel of the Office of Science and Technology had hoped this would be one of the experiential outcomes of the Wooldridge Committee operation.

The creation of the Wooldridge Committee was one of the aftereffects of criticisms of NIH made by the Fountain Committee (the Intergovernmental Relations Subcommittee of the House Government Operations Committee, Representative L. H. Fountain of North Carolina, chairman). The Fountain Committee had charged that NIH had both committed and encouraged loose practice in grants management and that the university grantees had not assumed responsibility for prudent management of public funds. Although the Fountain Committee had not gone very deeply into appraisals of scientific quality, it had raised questions which some felt had to be resolved one way or the other.

Apart from this background, and its continuing implications, it had also become apparent that the time was at hand for a full-fledged review of NIH operations in the light of NIH's phenomenal growth. In the summer of 1963, therefore, President Kennedy directed the Office of Science and Technology to make the study discussed here, which got under way early in 1964 after the need for such a review had been reaffirmed by President Johnson.

Summary of Findings and Conclusions

In brief, the Wooldridge Committee made these findings and arrived at these conclusions:

1) The "large majority" of NIH intramural and extramural research is of high quality.

2) The large, centrally managed, collaborative research programs—the so-called "crash programs"—have not been well managed, have not produced gratifying results, and have not been well designed scientifically. The program of the Cancer Chemotherapy National Service Center came under particularly critical review.

3) The best available method for awarding research grants is through the study-section procedure, which utilizes scientific peer judgments.

4) The NIH needs urgently to strengthen its management capabilities, especially if it is to be able to assume growing responsibilities in directed research, demonstration projects, training programs, long-range planning, and the ensuring of optimum utilization of its funds.

5) Overall grants-management responsibilities of the universities must be stengthened. Where university action to strengthen grants management is not forthcoming, NIH should use its granting authority as leverage to "encourage" administrative improvement and to punish unresponsive universities.

6) The authority of the director of NIH should be strengthened while, at the same time, the autonomous status of categorical institutes should be diminished. There should be a strengthening of staff support for the NIH director, particularly in the area of program planning.

7) A new Policy and Planning Council should be created to assist the director of NIH in making of major plans and policies, especially those related to allocation of funds and resources. The new council should be encouraged by appropriations committees of the Congress to participate in the annual budget hearings.

8) The organizational stature of NIH should be upgraded by giving the director "easier access to and greater participation in the councils of higher authority in the Department of Health, Education, and Welfare," especially at the policy level of the Secretary.

9) The intramural program of NIH should be reviewed to assure that, for all activities, there is justification for conduct by the government. The report inferred that the desirability of government conduct of "independent, university-like research" is subject to question.

10) The present limitation of indirect project costs to an arbitrary

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percentage of direct costs should be replaced by a new system. All costs, direct and indirect, should be itemized and, if less than 100 percent is to be paid, the same fractional reimbursability should be applied to both direct and indirect costs.

11) The investigator should be made to feel that his salary comes from the university. Accordingly, the costs included in a grant which are attributable to the salary of the investigator should be separately negotiated between NIH and the institution.

Several other recommendations were made, including the following.

The director of NIH should be given greater discretion for the transfer of funds from one category to another. This would permit him to accommodate unanticipated program needs and to use unexpended program balances in some areas for the relief of shortages in others.

The amounts of grants for the support of general research should be enlarged in order to give university administrative authorities greater control over the content and direction of research programs. These grants should be made available for science departments outside the medical schools.

In recognition of the increasing quantification of the biological sciences, NIH should encourage greater participation of physical scientists and mathematicians in all aspects of its operations.

The administrative executives of grantee institutions should be given authority to make a variety of project-related decisions at present reserved for central NIH determination.

Organization of the Report

Before commenting on the specific findings and proposals of the Wooldridge report, I want to discuss its organization. The document as a whole is 213 pages long. The committee's official judgments are contained in the first 49 pages. All else is addendum material with which the committee said it may or may not have been in agreement. These supplementary materials are the separate reports of the panels and special groups set up to advise the Wooldridge Committee.

The overall committee, consisting of distinguished educators, industrialists, scientists, and philanthropists, devoted itself to issues cutting across the NIH effort as a whole. Advising the Wooldridge Committee were 11 panel groups of which eight were devoted to the life sciences: the anatomy, behavioral sciences, biochemistry, biophysics, microbiology, pathology, pharmacology, and physiology panels. These, it will be noted, ignored the categorical organization of NIH research. To complete the list, there were an administration panel, a physical sciences panel, a review procedures panel, and a group of *ad hoc* panel members.

When any reference is made here to the findings, conclusions, or recommendations of the Wooldridge Committee, it pertains to material within the first 49 pages. Likewise, a reference to the "report" refers only to material in pages 1–49.

Whether or not it was so intended, this format permitted statements to be made and published without responsibility for them being attributed to the Wooldridge Committee itself. Some very strong statements were made in this way, including one on cancer chemotherapy and collaborative programs in general, and another on congressional involvement in such programs. The committee recommended a careful reading of individual panel reports, which serve also as state-of-the-art reports and projections. It should be noted, however, that on topics dealt with in common, the panels were not necessarily in agreement.

Some mention should be made of the relationships between panel members and NIH. The eight life sciences panels had, in all, 74 members, of whom eight were government employees. Of the remaining 66, 58 were listed in the 1963 research grants index of NIH as project grantees. From all 11 of the advisory panels, 38 members were listed in the 1963 edition of *Roster of Members of PHS Public Advisory Groups* (Public Health Service publication 262A). One member of the committee itself also was listed in the *Roster*. These project grantees and PHS advisers were asked to make assessments of the output of a system of project approval in which they were intimately involved both as grantees and as members of peer review groups. The defense given for this aspect of the system is the usual one: you simply cannot find many competent scientists who are not under NIH grant support and not members of study sections and other advisory groups. This is undoubtedly so. Still, it does not dispose of the subtle influence on judgmental processes which occurs when people who are part of a system are asked to review the products of that system. The report did not indicate that many panel members and advisers were either grantees of NIH or members of NIH or PHS advisory or review groups.

Notably absent from membership in the Wooldridge Committee itself or its advisory panels were prominent medical research men and others who have been influential in multiple roles as "citizen witnesses" before appropriations committees, as members of NIH advisory councils, and as participants in a number of national advisory bodies. This group includes such people as Michael DeBakey, Sidney Farber, Philip Handler, Isador Ravdin, and Howard Rusk, among others, who have carried a heavy load in these roles.

One explanation is that most of these people were already members of the President's Commission on Heart Disease, Cancer, and Stroke—a commission whose life span largely paralleled that of the Wooldridge Committee. In fact, Philip Handler of Duke University was originally to have been chairman of the biochemistry panel of the Wooldridge Committee but resigned when appointed to the President's Commission.

Is NIH a Science Agency or a Health Agency?

The Wooldridge Committee asserted that "NIH devotes its principal efforts to a broad program of investigation of life processes, rather than to a search for direct cure or prevention of specific diseases." The committee stressed the desirability of such a "normal science" approach and attacked the "head-on" approach as being "frequently the slowest and most expensive path to the cure and prevention of disease." Note that the Wooldridge Committee didn't merely state that this is how NIH should conduct its work. Rather, it asserted that this is the way things actually are. This fact, it observed, may not be generally understood. "Cursory reading of the various legislative acts that establish NIH powers and responsibilities would not make this point clear," stated the report. "Similarly, the employment of such labels as 'heart,' 'cancer,' 'neu-

rological diseases and blindness,' and the like, in the titles of the major organizational units of NIH, suggests more of an orientation to specific diseases than actually exists. Although there are practical reasons for such an overemphasis on disease categories in the organization structure, it is not ideally suited to the kind of research programs which must actually be carried out. One of the accomplishments of the NIH management has been that of making a scientifically inappropriate organizational structure an effective arrangement for performing its real mission."

In short, the report states that NIH is not a disease-oriented organization. It is, rather, engaged in the support of fundamental research into life processes along normal disciplinary lines. While NIH justifies its programs to the Congress and to the public in terms of drives on various disease fronts, these are merely "practical" expedients through which NIH has to operate, stated the Wooldridge Committee.

A notable deficiency in this argument is any discussion of the overall mission of NIH. It would seem essential to go into this matter in some depth before making recommendations affecting mission. The Wooldridge Committee and its panels do present a concept of mission, which is for NIH to function mainly as an instrumentality for funding biomedical science organized along disciplinary lines. What seems to have been overlooked is that NIH is also a public instrumentality. Its growth up to its present dimension was made possible because forces of persuasion convinced the public that, through NIH and its categorical institutes, massive assaults would be launched against various disease entities. Whether or not this is best from the standpoint of normal science is an argument apart. There is still the serious matter of accommodating the expectations of the public. Besides, a persuasive case might also be made for disease-oriented research as having its own fundamental outputs. The classic example in this regard is the development of the poliomyelitis vaccine, a project of the National Foundation. From the standpoint of the public this was a successful outcome in a campaign against a specific disease entity. As viewed from a broader scientific standpoint this mission stimulated advances in virology which continue to have their referred and deferred effects, not the least of them being in connection with the possible viral etiology of cancer. There are, thus, many roads to Rome. The NIH travels many of them. It needs to do so in the future, to assure that progress will be balanced and rapid.

A related problem, hinted at tolerantly by the Wooldridge report, is the public posture of NIH in telling what it is doing. Is it proper to assume the role of disease chaser in the popular prints while playing the more correct role of fundamental researcher in scientific circles?

Assessment of Research Quality

The report's general endorsement of the quality of research "currently supported" by NIH seems to raise more questions than it purports to answer. There is, first, the overall question of the relationship between good management and research quality. Here we have a dilemma: if the quality of management has been deficient both within NIH and in the universities and if, nevertheless, research continues to be of high quality, why be concerned about good management other than to make sure that no funds are improperly diverted? On the other hand, it might be more realistic to ask whether there *can* be a consistently high level of research quality in the face of inadequate management.

Then there is the matter of the rate of growth of NIH appropriations as compared to the expansion of the scientific community dependent upon NIH. "Despite the tenfold increase in NIH support of research during the last eight years, there is no evidence of over-all degradation in quality of the work supported," stated the report. "On the contrary, there is good evidence that the average quality is steadily improving. This appears to be a consequence of a rate of increase in the production of competent biological research scientists matching the over-all rate of increase in research support." For this, the report offers no documentation. It takes from 10 to 12 years to double the scientific population. One must assume that in this doubling there is no more than a proportionate increase in numbers of scientists of excellence. One might well infer, to the contrary, that exponential increases in funding attracted marginal and submarginal investigators in some degree. This could be inferred from the fact that observations made just before the major period of NIH growth, which began in 1957, indicated that the supply of first-rate researchers was then fully committed. The Wooldridge Committee, in effect, concluded that a politically determined level of spending brought into being a corresponding number of competent scientists.

In raising these challenges I do not charge that NIH research, whether intramural or extramural, is not of high quality. I have no way of knowing. It does not seem, however, that the Wooldridge Committee satisfactorily disposed of the question.

The committee said that it had confidence in the validity of its conclusions about quality because of the competence and distinction of its consultants and the extensiveness of their survey. The committee went to considerable pains to explain the methodology of the survey, especially the statistical sampling method used with the advice and assistance of a panel of three distinguished statisticians. The committee did not, however, go into the question of whether the members of its advisory panels should have been asked to evaluate the products of a system of which they were a part. Nor did the committee reveal the criteria followed by panel members in reviewing research projects to determine their quality. It is understood that such criteria were given the various panel members, but part of the understanding with the institutions which were to be visited was that all project reviews and even the criteria pertaining to them were to be held confidential. It is an interesting point, for it raises a collateral question of public access to information about how public funds are spent.

The report stated: "Out of the 240 'traditional' extramural research grants investigated, the panel teams expressed serious reservations about 9 projects and adjudged an additional 7 to be unworthy of support. In scientific research, such a ratio of ill-advised projects, when judged after the fact, is impressively low. Much more frequently, NIH-supported work was found to set the national or international standard of excellence in its field."

One would hope that the statistical sampling was proper and that subjective factors in evaluation were not

at work, for these figures are impressive. There remain the questions raised above. Also, the report did not include any comment on 268 other, nontraditional research grants also investigated. Neither did it draw attention to this selective subsampling.

If the findings on quality are to be believed, one must reevaluate the many, many criticisms of recent years to the effect that the scientific literature (the products of research) is bogged down by an abundance of trivia —bibliographical buildups, replications of work already done, and data of questionable value. While such allegations are subjective judgments, the fact that they are made by responsible individuals leads one to conclude that there must be something to them. Perhaps this is an area for a new committee to investigate.

The assurance of quality is further clouded by some knowledge of the realities of grantsmanship. It is fairly common knowledge that the right labels are often placed on the wrong bottles. Research projects may be designed to support a teaching position or a principal investigator who spends much or most of his time away from the university, discharging the duties of a "research entrepreneur" rather than those of a conductor of research. Moreover, it is a fact that the timing of a new research project is more likely to coincide with the need for maintaining a steady or rising state of staff support than with bursts of creativity. In themselves, none of these comments refutes the major finding on quality of the Wooldridge Committee. Rather, these questions are raised as gross challenges because the scientific community is left in the dark as to the nature of the criteria of review.

On a related matter, the Wooldridge Committee endorsed wholeheartedly the peer-judgment mechanisms of approving requests for research awards. The committee and its review-procedures panel were almost lavish in their praise of the panel system. The question raised here, however, is whether the Wooldridge Committee addressed itself to the pertinent issue—that of whether the panel mechanisms can be strengthened, not of whether they are necessary.

The stream of criticism which has been directed in recent years against the panel mechanism by Alvin Weinberg and others has been to the effect that panels, for all their virtues, tend, through cults of personality, to inhibit progress. The Elliott Committee pointed to the growth of a "panel establishment." The consensus of past constructive criticism has been that panels could stand more membership rotation than they actually have had. The Wooldridge Committee did not, however, deal with this problem. Moreover, scant attention was given the role of advisory councils in project review. There was a time when advisory councils were able to review projects individually because there were fewer projects than there are now. In fact, during the earlier days of NIH growth, descriptions of new projects were published in the appropriations hearings. Now, advisory councils rarely examine individual project proposals.

One other study which dealt with the panel situation was that of the Kistiakowsky report [National Academy of Sciences, Committee on Science and Public Policy, *Federal Support of Basic Research in Institutions of Higher Learning* (1964), George Kistiakowsky, chairman]. The request for this study was made in a resolution of the American Society of Biological Chemists and other scientific groups as a direct response to the activities of the Fountain Committee and the actions it had obliged NIH to take. The principal contribution of the Kistiakowsky report was to call for strengthening of weaknesses in the panel system through which research proposals are evaluated and to call for new types of research support to correct imbalances.

Criticisms of Collaborative Research

The criticisms of the quality of collaborative research must be considered within the framework of the larger thrust of the Wooldridge Committee and its panels. This larger objective appears to be that of bringing more firmly under the outside academic establishment the control of the federal effort in biomedical science—that is, to make this effort conform to the academic disciplines. As mentioned earlier, the committee insisted that the most rapid progress against specific disease entities is likely to come not from organization by disease categories or from crash programs but from continuing inquiry into the life processes. Hence, it is understandable that all the recommendations of the Wooldridge Committee on the conduct of science are oriented toward the values of the academic establishment.

On the other hand, the committee's criticisms of science programs are concentrated on the products of what NIH staffers call The Establishment, consisting of a mutually reinforcing group of "citizen witnesses," key members of congressional appropriations committees, key officials in the executive branch, and the leadership of the Mary Lasker organization (a philanthropic group which concentrates on expansion of federal health programs). The citizen witnesses are those who testify before the appropriations committees; who dominate the advisory councils and the occasional commissions on growth of the enterprise; and who were responsible for the inception of at least several of the crash collaborative research programs, in particular the cancer chemotherapy program.

One can undoubtedly find much support in the scientific community for criticism of the collaborative research programs. "NIH is experiencing difficulty in achieving the results desired from its large collaborative activities," stated the report. "In particular, many medical scientists question whether the value of the Cancer Chemotherapy Program, which accounts for more than half of all Collaborative Program funds of NIH is commensurate with its cost. We advocate the appointment of an *ad hoc* committee to make a study of this program and to recommend any necessary changes in direction."

A subpanel of the Wooldridge Committee said of the Cancer Chemotherapy National Service Center: "Because the availability of money exceeded the availability of sound ideas, some unsatisfactory effects inevitably resulted. . . . We believe . . . that the CCNSC should have been taken through an extensive pilot project stage before its full-scale launching." This is not a new idea; opponents of the mass trial approach took the same position when the cancer chemotherapy program was first being debated. They were, however, overruled because of continued pressures by Establishment members.

The committee noted that the current budget for cancer chemotherapy is approximately $34 million a year but that related projects bring the total to approximately $47.5 million a year. Even at the lower figure, the commit-

tee noted, this is the lion's share of all NIH collaborative research, which in fiscal year 1964 was $58 million. The suggestion was that some of the money spent on cancer chemotherapy might more constructively have gone for other pursuits.

Although the committee did not make specific critiques of other collaborative research programs, it identified several of them. The Psychopharmacology Service Center received no mention at all. It was explained that this program had not been picked up by the sampling procedure. This is regrettable since the psychopharmacology program has been so vigorously touted by certain Establishment members as to command a great deal of public interest. A review of this program would reveal difficulties of a different kind from those found in the cancer chemotherapy program. In some respects the problems are even more critical, for they involve the quality of research on human subjects. One wonders, also, why the collaborative project on perinatal disease received no comment, since it is open knowledge that it is in trouble.

The Wooldridge Committee criticized the National Cancer Institute in particular for having dropped outside advisory consultants from the cancer chemotherapy program. The NCI said it did so because it found that some of its professor-consultants had too many conflicts of interest. That is, in addition to being professors they were consultants to drug companies, often had proprietary interests in drug enterprises, and were advising the National Cancer Institute on the awarding of contracts to enterprises in which they had interests. The Wooldridge Committee felt, however, that NCI took advantage of this situation in order to divest itself of outside consultants. The committee felt that NCI could have found acceptable advisory panel members.

The committee reaffirmed the desirability of having collaborative programs as a function of NIH but listed certain prerequisite conditions.

1) Use of outside experts to advise on the feasibility of proposed collaborative programs.

2) Exercise of an advisory review by the proposed Policy and Planning Council for all major collaborative programs.

3) Contracting flexibility to permit the NIH to turn over program-management responsibility for collaborative programs to outside organizations, when justified.

4) A policy of keeping each collaborative program as small as possible.

5) An inviolable rule that no large collaborative program will be started until a strong management team is available, regardless of how scientifically promising the program may be.

6) More dependence on continuing appraisal and advice by outside scientific consultants than has recently been the case.

There is a suggestion to the Congress that it desist in future from directing the setting up of various crash programs. While the committee itself avoided direct comment on this, one of its subpanels said: "The Congress should not be disenchanted of biomedical science by the seeming slowness of progress toward specific goals."

The subpanel then suggested that when the Congress identifies health priorities it should defer to the judgments of outside peer groups. Some criticism of both crash research programs and the categorical-disease approach to biomedical research is implicit in the panel's call for "a catholic attitude to recognize that discoveries made in the pursuit of one health problem can often be exploited to yield answers for a second health problem even before the first one has been solved."

Strengthening University Management of Science

The criticisms of the management of science programs both in NIH itself and in its grantee institutions come within the realm of normal expectation. A scarcity of managerial maturity seems to have become a concomitant of progress in practically all areas of science and technology as well as in the professions generally. One can even say that the professional manager who looks to the problems of others is often himself in need of repair, like the preacher and the cobbler. While this is a rationalization, it is not a justification for not doing something about problems once they have become identified. Moreover, in the NIH situation the problems have been aggravated by an unusually steep curve of growth.

The solution proposed by the Wooldridge Committee to enforce the upgrading of grants management in the universities is for NIH to use its grant-making leverage to compel good practice. "In the absence of adequate administrative improvement, NIH should substantially curtail the amount of its support for the institutional investigators," said the report. One can think of nothing that is more likely to raise the academic hackles than for NIH to say to a university: "Either you straighten out and fly right or we'll cut your grant support levels." After all the charging and countercharging that came in the wake of the Fountain Committee report, to the effect that it was urging interference with academic freedoms, the Wooldridge Committee proposal for direct federal intervention comes as something of a shocker. In fact, the classical argument against the federal grant-in-aid approach is this: first you woo them with money; then you get them to like its feel; and then you begin to impose conditions for their continued receipt of your money. By that time you begin to own them mind and body.

Centralizing Authority in NIH

The proposals to centralize authority in the director of NIH and to provide him with staff facilities for enhancing his program-planning capabilities should be considered in the light of previous patterns of NIH organizational growth. Most of the pressure for NIH expansion came from outside. The creation of both the Cancer Institute and the Mental Health Institute, the first two categorical institutes established within the overall hegemony of NIH, came about through outside pressures. Thereafter, other categorical institutes were added, each with its own outside supporters and beneficiaries. In the same way, collaborative research programs were superimposed on this structure, all without regard to any grand design which would assure balance and integration of effort. Each of the categorical institutes has its own statutory authority, its own appropriations, its own advisory council *responsible to the Surgeon General,* and its own group of citizen witnesses.

A natural fear on the part of the scientific community is that centralization of planning and authority in the hands of the director of NIH could lead to a monolithic, authoritarian

bureaucracy. Just as academicians in the universities resist the imposition of authority by their own administrative officers, so NIH scientists in the categorical institutes would be likely to object to an authoritarian structure. In this, they might well be supported by their outside academic colleagues, who could be expected to say, "Though the present leadership consists of 'good guys,' who might succeed them in the future?"

Certainly the Wooldridge Committee did not have in mind any such developments. Rather, it sought a redress of balances to enable the NIH director to exercise an overall responsibility for programs where, before, his resources for such purposes were extremely limited. Nevertheless, the proposed concentration of authority is a change in the power structuring of NIH which would have to be brought off with consummate skill in order to preserve the advantages of decentralization, fragmentation, and scientific pluralism within the framework of overall planning.

A corollary proposal is to create a Policy and Planning Council which would advise the NIH director, review major new program proposals (especially proposals for collaborative research programs) and, if the Congress is willing, provide budgetary advice. Of course, the proposal has merit, for there is now no overall advisory council to which the NIH director can turn for guidance. There is, however, the risk that a new elite group could thereby be created which might dominate a less independent personality than the present director, James A. Shannon. This, of course, is no reason for not embracing the proposal. Rather, the argument comes under the heading of customary caution.

The Wooldridge Committee made a point in advancing the principle of providing independent "advice" (rather than governance) to the NIH director. It went further in suggesting a specific mechanism, and in urging its expeditious creation. It might also have suggested viable alternatives, but it did not do so.

What is likely to provoke more than merely spirited reaction behind the scenes is the suggestion that Congress turn to a new source of scientific guidance in the development of its own budget judgments pertaining to the NIH. As the proposed Policy and Planning Council would consist of experienced and distinguished scientists in addition to a minority of outstanding nonscientists, one possibility is that its members could supersede the individuals who comprise the so-called "professional judgment budgets" upon which the House Appropriations Subcommittee relies. As a source of judgments its members could supersede the citizen witnesses upon whom the Senate Appropriations Subcommittee relies. One cannot imagine that a shift in the locus of exogenous power would be effected very peacefully. At the very least one might expect a lively competition for membership on the new council, if it should be established and if it should bring about a shift in locus of informal elite power.

Organization of NIH

The proposal to give the director of NIH greater access to the highest councils of the Department of Health, Education, and Welfare was left vague, presumably because of ongoing studies of HEW-PHS-NIH structure. On the one hand there seems little doubt that the phenomenal growth of NIH within the framework of the Public Health Service has created organizational problems. It is probable that, as the scope of health programming in the federal government broadens further, many separate agencies will become operationally involved. This lends support, perhaps, to current proposals to establish a Department of Health. On the other hand there are arguments for bringing NIH, the Office of Education, and the National Science Foundation organizationally closer together, because of their common interest in building up the academic establishment.

One related question not touched upon at all is the distinction between functions of NIH and of the National Science Foundation. The original concept for NSF was that it would be a source for the funding of free, nonmission-oriented research, including the broad area of biomedical science. The overall thrust of the Wooldridge Committee would seem to be in the direction of expanding what should be an NSF capability, as stated in the NSF charter, through the structure of NIH.

This may be the time to consider other holdover issues. For example, should the Division of Biologics Standards remain in NIH or should it be combined with the Food and Drug Administration, with which it should have greater homogeneity of interest? The National Institute of Mental Health is becoming extensively involved in the conduct of community action programs; this suggests the possibility that it has outgrown NIH. Unlike the other categorical institutes, it is heavily involved in the politics of federal-state relations. One possibility might be to retain within NIH, as a research organization, only those activities which are of an academic-research nature, relating to the biological bases of mental disease, psychopharmacology, behavioral phenomena, and related work.

The suggestion that NIH might be divested of at least some of its intramural activities calls for the most careful consideration. The Wooldridge Committee said that it "is not convinced that it is sound for the Federal Government to conduct large amounts of scientific research of the kind that non-Federal institutions are equipped to carry out," and that "a majority of the NIH intramural program appears to be of this nature." The NIH intramural scientist is described as having at least as much "academic" freedom as his university counterpart, and probably more. Furthermore, he is described as having fewer "red-tape" annoyances and fewer distractions such as faculty meetings, department administrative assignments, committee activities, and the like. "Not being in an educational institution, he need not teach; he can devote all his time to research." The lack of teaching responsibility as a possible partial basis for the development of the large intramural establishment was examined by the Wooldridge Committee. "Nonteaching positions in basic health research are certainly not common, and perhaps there is here a legitimate hole for the government to fill in the nation's health science structure. However, we suspect that the size of this hole may not be very great."

The most obvious comment one could make is that nonteaching positions on a *de facto* basis are plentiful throughout the academic community. Why the lack of teaching responsibility at NIH should be a matter either for implied criticism or for envy is difficult to understand, unless it is that NIH intramural researchers don't even have to pretend they are teaching. As for NIH scientists' being relatively free of administrative and bureaucratic

distractions, one has but to try to get some of them on the telephone. He will discover how universally their time is consumed in attending meetings, fulfilling administrative requirements, and so on and on.

If anything, NIH scientists are to be commended for their concentrated adherence to purpose in the face of financial disadvantage. In contrast, their academic colleagues, in many or most cases, can avail themselves of consulting and summer research opportunities which bring them substantial incomes in addition to their base salaries, which already exceed those paid by the government to their scientists, the latter situation being a historic reversal. Ironically, it is NIH fund-granting which has helped bring this about.

The only action on the intramural issue called for at this time by the Wooldridge Committee is a study by the proposed Policy and Planning Council, although the report goes quite far in intimating what might be the outcome of such a study. What the committee did not bring out is the fact that the intramural program has escaped criticism to a singular degree. It is one of the bright spots in the NIH firmament. The committee suggests that the intramural staff members have little impact on the extramural programs, and that such an impact cannot be used as an argument for maintaining intramural activities at present levels. If this should actually be the case (the committee did not document this statement) it might be desirable to enhance the intramural scientist's role as reviewer and consultant in grant-making.

One can see other reasons for having a strong intramural capability in considerable depth. Thus, the national interest might well be served by having a series of independent research units which are free, as the intramural laboratories are, of the preoccupations and maneuverings associated with "grant-swinging." Furthermore, the Wooldridge Committee has not made a case *against* the idea of having an independent type of research organization, with no teaching obligations, nor has it made a case for a virtual monopoly of research by the universities. One could, in fact, muster arguments in behalf of having more independent research organizations dissociated from the universities. Admittedly, these considerations were outside the frame of reference of the Wooldridge report, but they bear on the intramural issue.

The "enrichment value" of a strong intramural program seems not to have been considered. This is a value the committee could not readily identify or weigh. Nevertheless, it would seem logical to argue that a strong intramural program, which includes advanced work by distinguished scientists, helps in recruiting and retaining the total NIH staff, both intramural and extramural.

In a pluralistic system, such as science should be, there is some value, also, in having as many independent points of view as possible. If NIH is to build up its overall planning capability it will need to have contributions from both its intramural and its extramural staffs.

Payments to Universities

The indirect-cost issue has been festering its way through a seemingly endless series of investigations and reports by the scientific establishment, the Congress, and the executive branch. The Wooldridge Committee, in a new approach, now argues that it is unfair and unrealistic to distinguish between direct and indirect costs. In other words, all incoming work adds to the burden of overhead, which then must be funded in some way, usually through diversion from other university programs. The committee suggested that ordinary industrial accounting practices be followed. All overhead costs would be allocated to direct costs in arriving at total costs to be charged to the customer. If the customer—the federal government—then wants to pay less than 100 percent of total costs it should do so across the board, not distinguishing between direct and indirect costs. Presumably the university would then be able to budget the aggregate load of research it could support if it must make a matching contribution.

The proposal that salaries of investigators not be included in the research grant proposal deserves careful study. The reasoning was dual: the investigator should not be demeaned by having to negotiate his own salary with his professional peers; his loyalty to his own institution would be strengthened by having his salary more dependent on the negotiations of the latter with the NIH. While this proposal may be in the right direction, the niceties would need careful engineering. It would seem that salaries within a university need to be considered within *its* total pattern.

Conclusions

Progress is being made, undoubtedly, in the development of mechanisms for assessing federal science operations. One must conclude, however, that the Wooldridge Committee approach does not serve as a model for the future. The committee did not avoid built-in biases of interested parties in selecting its advisory panels. It did not publish the criteria it used in making assessments of research performance. It did not propose alternative actions. It did not provide adequate documentation either to support its own findings and recommendations or to enable readers to make independent assessments.

Finally, any study of NIH can be little more than a fleeting view of a moving scene. New program dimensions generate new relationships and, in turn, new stresses and strains. Minor difficulties become major ones. Old problems fall out. The full implications of the proposed regional medical complexes, recommended by the President's Commission on Heart Disease, Cancer, and Stroke, are yet to manifest themselves. One of the issues engendered by this proposal is, Who shall administer the new research funding for the medical complexes? Whether or not this is to be done through NIH is yet to be decided. (At the time of writing, the HEW conclusion was that NIH should have this responsibility.) In any event, new patterns of funding academic research are likely to emerge—together with new problems.