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85th Congress
2d Session

COMMITTEE PRINT

PATENT PRACTICES OF THE NATIONAL SCIENCE FOUNDATION

PRELIMINARY REPORT

OF

THE SUBCOMMITTEE ON PATENTS, TRADEMARKS, AND COPYRIGHTS

OF THE

COMMITTEE ON THE JUDICIARY

UNITED STATES SENATE

EIGHTY-FIFTH CONGRESS, SECOND SESSION

PURSUANT TO

S. Res. 236

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FOREWORD

This report was prepared by Herschel Clesner, under the supervision of Robert L. Wright, chief counsel of the Subcommittee on Patents, Trademarks, and Copyrights, as part of the subcommittee's study of the U.S patent system, conducted pursuant to Senate Resolution 236 of the 85th Congress, 2d session. It is the second of a series that will describe the current practices of each of the agencies of the Federal Government engaged in activities which may result in the ownership of patents by the Government or patent licenses to the Government from employees, contractors, or grantees.

This series of reports is based upon material assembled by the subcommittee in response to inquiries first made in the summer of 1957. The object of these inquiries was to determine how Government agencies have been discharging their responsibilities with respect to inventions in which the Government had a substantial financial interest, as the result of its expenditures for scientific research and development. No such inquiry had been made since the investigation some 11 years ago, which culminated in the Attorney General's report and recommendations with respect to Government patent practices and policies, published in 1947. The inquiries were mainly designed to show the extent to which Government agencies have followed or disregarded the recommendations of that report and the reasons underlying the policies presently followed by these agencies.

The recommendations of the 1947 report were summarized in the foreword to the first report in this series, which covered the Tennessee Valley Authority, and will not be repeated here, except to say that it favored the Government taking title to all inventions under research supported by Government funds unless a Government Patent Administrator or the head of a Federal agency directed otherwise in special cases when the Government would be entitled to an irrevocable, royalty-free license. The patent practices of the National Science Foundation reflect a view of Government responsibility for the supervision of inventions produced by the expenditure of Government funds, which is opposed both to the practices of the TVA and to the 1947 recommendation of the Attorney General. As to research contracts and grants, the Attorney General had recommended that the Government should ordinarily take title to all inventions produced in the performance of the contract.

Up to now the Foundation has not thought it necessary to keep itself informed as to patent applications arising out of the research performed by its contractors or grantees. The question as to whether or not an application for a patent should be made for the benefit of the Government is therefore one in which the Foundation has not chosen to take any interest, although the law creating the Foundation clearly contemplated the possibility that Government patents or Government licenses should be obtained (42 U.S.C. 1871A; Executive Order No. 10521, sec. 6).

It seems doubtful that the Foundation's research grantees, most of which are educational institutions without any responsibility for carrying out Federal policy, are in a position to make decisions as to the desirability in the public interest of securing patent protection for federally financed inventions or discoveries. On the other hand, the Foundation, primarily interested as it is in pure, rather than applied research, may well be justified in feeling that none of its energies should be devoted to patent matters. The result is that, in the absence of a Patents Administrator, or some other Federal official, with primary responsibility for the proper exploitation of all inventions and discoveries produced as a result of the use of Government funds, the formulation of Government decisions is being wholly neglected, while the opportunity may be thus created for persons without Government responsibility to act for private interests alone.

As noted in the foreword to the first report, the subcommittee's views as to what the National Science Foundation or any other governmental agency ought to be doing with respect to patents on inventions produced with its funds is reserved for future comment. All that is presented here is a factual summary of the agency's statutory authority in this field, its current practice, and its own viewpoint.

JOSEPH C. O'MAHONEY,
Chairman, Subcommittee on Patents, Trademarks, and Copyrights,
Committee on the Judiciary, United States Senate.

JANUARY 2, 1959.

PRELIMINARY REPORT AS TO THE PATENT PRACTICES OF THE NATIONAL SCIENCE FOUNDATION

I. Legal Authority as to Patents

A. LEGISLATIVE

The National Science Foundation was created in 1950 and one of its functions is to—

> develop and encourage the pursuit of a national policy for the promotion of basic research and education in the sciences (42 U.S.C. 1862(1)).

For this purpose the Foundation has been given authority to—

> enter into contracts or other arrangements, or modifications thereof, for the carrying on, by organizations or individuals in the United States and foreign countries, of such basic scientific research activities as the Foundation deems necessary (42 U.S.C. 1870(c)).

The provisions which control the Foundation's patent policies are the following:

> 42 U.S.C. 1871(a).—Each contract or other arrangement executed pursuant to this chapter which relates to scientific research shall contain provisions governing the disposition of inventions produced thereunder in a manner calculated to protect the public interest and the equities of the individual or organization with which the contract or other arrangement is executed: *Provided, however,* That nothing in this chapter shall be construed to authorize the Foundation to enter into any contractual or other arrangement inconsistent with any provision of law effecting the issuance or use of patents.
>
> 42 U.S.C. 1871(b).—No officer or employee of the Foundation shall acquire, retain, or transfer any rights, under the patent laws of the United States or otherwise, in any invention which he may make or produce in connection with performing his assigned activities and which is directly related to the subject matter thereof: *Provided, however,* That this subsection shall not be construed to prevent any officer or employee of the Foundation from executing any application for patent on any invention for the purpose of assigning the same to the Government or its nominee in accordance with such rules and regulations as the Director may establish.

B. EXECUTIVE

Executive Order No. 10521, dated March 17, 1954 (19 F.R. 1499), gives the Foundation advisory powers with respect to research conducted by other Government agencies in the following provisions:

> SEC. 5.—The Foundation, in consultation with educational institutions, the heads of Federal agencies, and the Commissioner of Education of the Department of Health, Education, and Welfare, shall study the effects upon educational institutions of Federal policies and administration of contracts and grants for scientific research and development, and shall recommend policies and procedures which will promote the attainment of general national research objectives and realization of the research needs of Federal agencies while safeguarding the strength and independence of the Nation's institutions of learning.
>
> SEC. 6.—The head of each Federal agency engaged in scientific research shall make certain that effective executive, organizational, and fiscal practices exist to ensure (*a*) that the Foundation is consulted on policies concerning the support of basic research, (*b*) that approved scientific research programs conducted by the agency are reviewed continuously in order to preserve priorities in research efforts and to adjust programs to meet changing conditions without imposing unnecessary added burdens on budgetary and other resources, (*c*) that applied research and development shall be undertaken with sufficient consideration of the underlying basic research and such other factors as relative urgency, project costs, and availability of manpower and facilities, and (*d*) that, subject to considerations of security and applicable law, adequate dissemination shall be made within the Federal Government of reports on the nature and progress of research projects as an aid to the efficiency and economy of the overall Federal scientific research program.

II. PRESENT PRACTICE

A. ADMINISTRATION

The Foundation has no personnel dealing solely with patents and does not know the number or character of the inventions or discoveries produced under the contracts or other arrangements authorized by the above-quoted section 1871(a) of the act creating the Foundation. Its annual reports indicate, however, that its research has resulted in developments which include patentable subject matter.

> To date, the Foundation has not been notified that any such patent has been granted although it has been informed of patent applications by grantees from time to time.[1]

[1] Letter from William Hoff, General Counsel, dated Dec. 10, 1958.

B. TITLE POLICY

1. Employees

As noted above, section 1871(a) provides that no officer or employee of the Foundation may acquire, retain, or transfer any rights, under the patent laws of the United States in connection with performing his assigned activities and which is directly related to the subject matter. The Foundation conducts no research through its own employees. Therefore, no questions have arisen regarding title to employee inventions.

2. Contractors and grantees

The Foundation's research program is carried on mainly through grants to educational institutions and occasionally by research contracts with private concerns. In all instances the Foundation allows the grantee or contractor to retain title to all inventions which are made in the course of performing the assigned research. The grantee or contractor is required to give the U.S. Government a royalty-free, nonexclusive license to use the invention for governmental purposes. The Foundation, as a rule, does not acquire the right, through contract, grant, or other arrangement, to any technical information, know-how, specialized processes, or other proprietary rights that may be developed in connection with that invention. The Foundation has never construed the requirement that its contracts and grants dispose of inventions produced thereunder "in a manner calculated to protect the public interest" as requiring the assignment of title to an invention to the Government or any Government agency. It has thus relied entirely upon its contractors and grantees to determine when a patent application should be made and what use of these inventions may be made by individuals or organizations other than Government agencies.

C. FOREIGN FILING

The Foundation does not reserve the right to apply for foreign patents in any of its grants, contracts, or other arrangements or to require foreign applications by others. It therefore has no information as to such filing, if any, by the grantees, contractors, or the individual inventors.

The Foundation believes that the cost of filing foreign patent applications on any inventions which might result from its support of research would exceed any advantage the Federal Government might obtain.[2]

D. USE BY PARTIES RETAINING TITLE

As noted above the Foundation has not yet been informed that any invention which may have been produced by the expenditure of its funds has resulted in the issuance of a patent. Nor is it presently informed as to what has been done by others with respect to obtaining domestic and foreign patent protection on such inventions or as to the actual use made of such inventions by others.

[2] Letter of Aug. 26, 1958, from Robert Brode, Acting Director, National Science Foundation, to Senator Joseph C. O'Mahoney, chairman of the Senate Judiciary's Subcommittee on Patents, Trademarks, and Copyrights.

III. Agency Viewpoint

The Foundation states that its—

> present patent policy was arrived at after long and careful study, taking into account the needs of the Federal Government and the role of the Foundation with regard to support of basic scientific research. We believe the present Foundation policy to be an appropriate one for the Foundation to follow and that it should be continued.[3]

However, since this preliminary report was brought to the attention of the Foundation, its General Counsel has indicated that the Foundation may abandon its present policy of waiting until a patent issues to obtain a license to use the invention produced with the expenditure of its funds. In the General Counsel's letter of December 10, 1958, he states:

> The Foundation is considering a revision of its patent clause to require the giving of the royalty-free, nonexclusive license to the Government upon *application* for a foreign or domestic patent rather than upon *issue* of the patent as presently required. If and when this revision is put into effect the Foundation will be informed at an earlier point as to the steps being taken by its grantees in connection with patent rights on inventions developed during the course of Foundation-supported research. (Italics supplied.)

[3] Ibid., supra, note 2.

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"Fount. Comm. Report" Mrs. Wilfong

Union Calendar No. 303

90th Congress, 1st Session - - - - - House Report No. 800

THE ADMINISTRATION OF RESEARCH GRANTS IN THE PUBLIC HEALTH SERVICE

NINTH REPORT

BY THE

COMMITTEE ON GOVERNMENT OPERATIONS

OCTOBER 20, 1967.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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U.S. GOVERNMENT PRINTING OFFICE

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LETTER OF TRANSMITTAL

HOUSE OF REPRESENTATIVES,
Washington, D.C., October 20, 1967.

Hon. JOHN W. MCCORMACK,
Speaker of the House of Representatives,
Washington, D.C.

DEAR MR. SPEAKER: By direction of the Committee on Government Operations, I submit herewith the committee's ninth report to the 90th Congress. The committee's report is based on a study made by its Intergovernmental Relations Subcommittee.

WILLIAM L. DAWSON, *Chairman.*

[illegible] OF PARLIAMENT

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PREFACE

The purpose of this report is to examine and evaluate the performance of the Public Health Service—and especially of its principal research bureau, the National Institutes of Health—in administering grant programs for the support of health research since the Committee's previous reports on this subject in 1961 and 1962. Under the Rules of the House of Representatives the Committee has the duty of studying Government operations at all levels with a view to determining their economy and efficiency.

The report is based on hearings and intensive studies by the Intergovernmental Relations Subcommittee. The Subcommittee has carefully examined a number of large and varied Public Health Service grant programs and has identified areas of major administrative weakness. Consequently, the report is, and is intended to be, a critical one.

Health research today is big business. It is estimated that $2 billion was spent for health research in the United States in 1966, about 9 percent of the Nation's investment for all research and development. Two-thirds of the 1966 total ($1.4 billion) was provided by the Federal Government, with almost $900 million accounted for by the Public Health Service.

The health research expenditures of NIH alone were $808 million in 1966, of which $601 million was spent in the form of grants for the support of research in non-Federal facilities. By way of comparison, NIH grants for the conduct of research were only a little more than $14 million in 1950 and $192 million in 1960.

Because of the tremendous importance of health research both in social and economic terms, the Public Health Service bears a heavy responsibility for achieving the proper and efficient administration of the grant programs under its jurisdiction. Similarly, the Committee has a special responsibility to call attention to conditions which impair the efficiency and economy or otherwise detract from the effectiveness of these programs.

Inasmuch as NIH is the principal research arm of PHS, all of the programs and activities examined in this report relate to it. However, the Committee's general observations concerning grant administration are equally applicable to the National Institute of Mental Health (until recently a part of NIH) as well as to all other PHS units which administer research grant programs.

While the focus of this report is on research grants, the Committee also takes notice of PHS's training grants to the extent that they are intimately related to the problems under examination. Training grant programs constitute a large and expanding segment of the Public Health Service's responsibilities. The Committee expects, therefore, to examine this important area through a separate inquiry.

In the Committee's judgment, project grants will continue to constitute the primary method of supporting health research. On the

whole, the project system of awarding grants in national competition on the basis of scientific merit is a desirable way of accomplishing the Nation's research objectives.

Project grants, however, have their limitations, including the tendency to widen the gap between richer and poorer schools. Consequently, increased interest is being shown in the distribution of more of the Government's health research funds in the form of institutional grants. As pointed out in the report, institutional grants can be a useful supplement to project grants and can serve as a means of assisting weaker educational institutions. For these reasons, the Committee has given close attention to the institutional grant programs presently operated by the Public Health Service and has sought to identify weaknesses that should be guarded against in any extension of the institutional grant concept.

Some of the recommendations in this report extend beyond the Public Health Service and the Department of Health, Education, and Welfare because the PHS programs involved are interrelated with similar programs in other departments and agencies, and because these PHS programs have a major impact on national science and educational policies.

It is the Committee's hope that the agencies concerned will take prompt and appropriate action in response to the findings and recommendations of this report in order that the Nation's health research goals may be more effectively achieved.

Union Calendar No. 303

90TH CONGRESS, 1st Session } HOUSE OF REPRESENTATIVES { REPORT No. 800

THE ADMINISTRATION OF RESEARCH GRANTS IN THE PUBLIC HEALTH SERVICE

OCTOBER 20, 1967.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. DAWSON, from the Committee on Government Operations, submitted the following

NINTH REPORT

BASED ON A STUDY BY THE INTERGOVERNMENTAL RELATIONS SUBCOMMITTEE

On October 19, 1967, the Committee on Government Operations approved and adopted a report entitled "The Administration of Research Grants in the Public Health Service." The chairman was directed to transmit a copy to the Speaker of the House.

I. FINDINGS AND RECOMMENDATIONS

SUMMARY OF PRINCIPAL FINDINGS

The Committee's examination of several important research grant programs administered by the Public Health Service disclosed that the agency—and particularly its principal research bureau, the National Institutes of Health—has made relatively little effort to improve its administration of grants since the Committee's previous reports on this subject in 1961 and 1962. Inadequate administrative performance is demonstrated, for example, by the inept handling of payments for the indirect research costs of grantees and the extremely poor administration of the General Research Support and Health Sciences Advancement Award programs.

NIH and other PHS bureaus were found to have made excessive indirect cost payments to grantees. Excessive payments resulted from their practice of paying the maximum indirect cost rate permitted by law, contrary to the intent of Congress that only a grantee's actual indirect costs should be allowed if less than the statutory maximum. In many instances NIH paid the highest permissible indirect cost rate

even when it had negotiated research contracts with the same institutions providing for lower rates determined through Government audits.

In the case of one research organization, NIH's overpayments for indirect costs were found to total almost a half million dollars for grants awarded through the 1963 fiscal year. Moreover, in this and other cases NIH continued to make overpayments to these same grantees for almost 2 years *after* the Surgeon General had initiated action in 1963, at the urging of the Intergovernmental Relations Subcommittee, to recover the excessive payments previously made.

Within NIH itself, the individual institutes used different indirect cost rates when dealing with the very same grantee institutions. The failure of the individual institutes to follow uniform policies and practices was found to be largely the result of weak and ineffective central management in the National Institutes of Health.

Weak central management has been characteristic also of the Public Health Service. PHS has consistently failed to obtain compliance with many of its grant policies, and it has permitted unjustifiable variations among and within its bureaus in the interpretation and application of agency policies.

Research projects supported by grants from NIH and other units of the Public Health Service have, according to the agency's own ratings, declined in quality over a period of years. A large proportion of the projects now being supported by PHS were rated lower than good quality by the agency's expert consultants.

The Committee believes high quality should be the principal criterion for PHS support of research projects which meet program requirements. National objectives other than the support of meritorious work, such as strengthening the capability and resources of academic institutions and manpower training, should be accomplished through programs designed specifically for these purposes rather than through the project system.

The Committee is concerned by the tendency in the Public Health Service to use the services of a small group of individuals for long periods on advisory councils and other major advisory bodies. When some of the same individuals who have served on advisory councils for many years receive substantial NIH grants, and also testify before the Congress in support of the agency's appropriations, the appearance of favoritism is unavoidable. The Committee endorses the view expressed by the National Academy of Sciences that the Nation's manpower resources for advisory purposes are large, that more advisers should be used and rotated more often, and that younger scientists should be afforded an opportunity to serve on PHS panels.

The Committee found serious weaknesses in the several types of institutional grants administered by the National Institutes of Health.

NIH entered into an unusual cost-sharing agreement with a large research institute to underwrite approximately one-half the latter's total operating expenses. This arrangement has the effect of: (1) substituting the grantee's own judgment for that of the PHS's scientific review committees with respect to the merit of the research projects supported, and (2) removing from national competition, over an initial 5-year period, approximately $23 million of health research funds. This unusual commitment was made without first developing workable methods for the comprehensive scientific and administrative review of a large institution's total program. Furthermore, it was made even

though the grantee's success in competing for NIH grants on the basis of merit was no better than average, and NIH had been advised by the HEW General Counsel's Office that the grant could not legally be awarded either as a "project" or as a "general support" grant—the two types of awards specifically authorized by the Public Health Service Act.

The procedure used in initiating another new institutional grant program—the Health Sciences Advancement Award—was found to be irresponsible, unscientific, and contrary to the best interests of the academic community and the Government. The first awards under this program were made:

(1) without adequate study of the needs of various types of institutions for development funds;

(2) without careful formulation of program objectives and policies;

(3) without a prior public announcement of the new program and its eligibility conditions;

(4) without open competition for the available funds; and

(5) without clear statutory authority.

Moreover, it is apparent from NIH's recent handling of the second group of HSAA awards that the purpose of this program is still unclear. The Committee believes that a Federal agency should have a mature and defensible plan for a new grant program before commencing it. NIH should not be "fumbling around," as one of its officials expressed it, when awarding substantial amounts of public money.

The Committee found NIH's administration of the General Research Support program surprisingly casual, with policies and procedures inadequately developed for the equitable and uniform treatment of grantees and with management indifferent to the waste of program funds.

The General Research Support program is intended to provide institutions already substantially engaged in NIH research some relatively unrestricted funds to help correct the imbalances in their total research and training activities created by Federal support of individual research projects. The amount of each grant is determined by a formula which takes into account the grantee's health-related research expenditures from both Federal and non-Federal sources, with the latter counting twice as much as the former.

Large amounts of GRS funds were paid to one private research organization by including State appropriations for two research divisions of a State health department in the grant computation. The GRS grants were computed in this manner, contrary to program policies, even though the research funds taken into account were not the grantee's and were not intended for it.

In addition, separate grants were made in some years to each of this organization's two branches, thereby giving the organization a larger total amount than it would have received from a single award because of a limitation in the grant formula. One branch received approximately as much in GRS funds, by counting State research expenditures as its own, as the total amount it received in NIH project grants. This is obviously a gross distortion of the purpose for which the GRS legislation was enacted.

The Committee found the premium given for non-Federal funds under the General Research Support formula difficult to administer

and wasteful of Federal research money. The Committee does not believe this premium operates as a meaningful incentive for institutions to seek private funds. The premium, on the other hand, favors research organizations over institutions of higher education—for whom the program was primarily intended—and favors wealthier institutions over poorer ones.

PHS research grants continue to be highly concentrated in a relatively small number of institutions. Moreover, the gap between the "rich" and the "poor" schools appears to have widened in recent years in the biomedical sciences. Although this disparity largely reflects the capacity of institutions to perform research, the Committee found that some PHS policies discriminate against smaller and less wealthy schools because they do not already have extensive research programs.

While the Committee recognizes the importance of increasing the number of first-rate universities, it believes it equally important that weak institutions be improved. It is inadvisable for NIH and other Federal agencies to award "development" grants to help already good schools achieve "excellence" in absolute preference to aiding the Nation's weaker institutions.

RECOMMENDATIONS

INDIRECT COSTS

Recommendation No. 1.—The committee strongly recommends that the Surgeon General make suitable arrangements to assure the uniform application of the Department's indirect cost rate information by all granting units of the Public Health Service. With respect to the use of off-campus rates, which are normally lower than on-campus rates, the committee recommends that the Public Health Service obtain sufficient information in grant applications and in subsequent reports to identify the locations at which the research is performed (p. 20).

Recommendation No. 2.—The committee endorses the concept of assigning Government-wide responsibility for establishing indirect cost rates with all institutions of a given type to a single Federal agency, with each type of institution audited by one Federal agency only. The committee recommends that this concept be vigorously pursued by the Bureau of the Budget and other interested agencies so that a final Government-wide plan covering all institutions will expeditiously be established (p. 22).

GENERAL RESEARCH SUPPORT GRANTS

Recommendation No. 3.—To eliminate some of the abuses that have developed in the general research support program, the committee recommends that program policies be changed immediately to:

(1) Determine each GRS grant on the basis of the recipient institution's research expenditures from Federal sources alone. The committee does not believe the premium given for non-Federal research funds under the existing formula operates as a meaningful incentive for institutions to seek private funds. Rather, this premium favors research organizations over institutions of higher education, and has been difficult to administer and wasteful of Federal research money, and

(2) Exclude from the computation base for a GRS grant all Federal payments for research which include fees above actual research costs (p. 28).

Additional recommendations concerning the GRS program appear below.

HEALTH SCIENCES ADVANCEMENT AWARD

Recommendation No. 4.—The committee strongly recommends that no future grant programs be initiated by NIH or the Public Health Service without fair and open competition after the purpose and the policies of the program have been carefully developed and publicly announced (p. 32).

Recommendation No. 5.—The committee further recommends that before any new grant program is started, or a major change is made in an existing program, the proposed regulations for the program be published in the Federal Register so that interested parties may have an opportunity to express their views. The final regulations should be approved by the Secretary before issuance (p. 33).

Recommendation No. 6.—The committee recommends that before any new program is initiated in the Public Health Service without specific statutory authorization, the program should be formally reviewed by the Department and the Executive Office of the President to determine its conformance with national education and science policies. Also, a written opinion concerning the legality of any such program should be obtained in advance from the HEW General Counsel (p. 37).

Recommendation No. 7.—The committee further recommends that no additional HSAA awards be made unless and until PHS obtains specific legislative authorization for this program (p. 37).

SHARING AN INSTITUTION'S TOTAL RESEARCH COSTS—THE SLOAN-KETTERING GRANT

Recommendation No. 8.—In view of the manner in which section 301(i) of the Public Health Service Act was used as a last resort to justify the Sloan-Kettering grant, and in view of the size and complexity of the Government's existing health research programs, the committee recommends that the Congress amend this provision of the act to clarify and limit the Surgeon General's blanket authority to adopt "such additional means as he deems necessary or appropriate" for the conduct and support of research (p. 41).

SHARPENING THE INSTRUMENTS OF SUPPORT

Recommendation No. 9.—The committee recommends that the Surgeon General establish a high standard of quality as the basic qualification for research project support, and that he develop adequate procedures for the uniform maintenance of that high standard by NIH and other bureaus of the Public Health Service. The confinement of research grants to projects in the range of excellent to good should not be breached except in special circumstances where the reasons for supporting a lower quality project are fully documented in a written record (p. 47).

Recommendation No. 10.—The committee recommends that the Public Health Service's responsibility for programs designed to develop or improve the capability and resources of educational institutions be limited to medical and other health professional schools. The general research support program is not included in this category since the Congress authorized these grants, permitting broad discretionary spending, specifically to supplement project grants. The committee recommends that the responsibility for grants intended to strengthen educational institutions other than health professional schools be confined to the National Science Foundation and/or the Office of Education—the two Federal agencies broadly responsible for strengthening basic science and education (p. 52).

Recommendation No. 11.—To provide for more equitable treatment of the smaller and less wealthy institutions, the committee recommends the following changes in PHS policies:

(1) Qualification for a general research support grant should be based on a school's receiving $100,000 or more annually in research project grants from all units of the Public Health Service combined, rather than exclusively from NIH. Moreover, HEW should consider broadening the general research support program, with appropriate legislative authority, to include health-related research grants made by other units of the Department in such programs as vocational rehabilitation and maternal and child health. Eventually, a single general research support grant for each eligible institution, administered on a Government-wide basis, would be most efficient and desirable.

(2) The same general research support eligibility requirements should be applied to health professional schools as to other institutions. To the extent that health professional schools require assistance in developing a research capability, this should be accomplished by a separate program of technical and financial assistance tailored for the purpose.

(3) The separate biomedical sciences support grant should be discontinued, and the general research support grant awarded to graduate schools on the same terms as to professional schools, hospitals, and research institutions.

(4) Until such time as a single general research support program may be established on a Government-wide basis, the NIH program and NSF's institutional grants program should be closely coordinated to avoid duplication. Some institutions presently receive general research support from both NIH and NSF computed on the basis of the same research projects; this occurs because NSF bases the amount of its award exclusively on the research (as well as some research training) grants it makes, while NIH includes these same NSF research grants in the computation for general research support awards (p. 52).

Recommendation No. 12.—The committee recommends, further, that the Secretary of HEW review the numerous NIH and other PHS training grant programs to determine if they are effectively organized to serve national manpower needs and objectives. This review should be concerned particularly with ascertaining if the institutions which receive large amounts of training funds are making a proportionate contribution to the nation's manpower supply. Conversely, the Secretary should determine if training grant policies

discriminate against schools which award graduate degrees in the biomedical sciences but receive little or no PHS training support (p. 53).

Recommendation No. 13.—The committee recommends that the President designate one or more Federal agencies to provide technical assistance, upon request, to help institutions plan for the improvement of their science education and research programs. It would be logical for the Public Health Service to be concerned with the health professional schools; other groups of institutions in which the biomedical sciences are taught might be made the responsibility of the National Science Foundation and/or the Office of Education (p. 55).

Recommendation No. 14.—The committee recommends that the President give early attention to the problem of improving the academic quality of weaker graduate institutions and that a unified and coordinated Federal assistance program be developed for dealing with this matter. The committee believes the present piecemeal and uncoordinated approaches of Federal agencies to institutional improvement are competitive, wasteful, and frequently not directed to the heart of the problem (p. 57).

SOME SPECIAL MANAGEMENT PROBLEMS

Recommendation No. 15.—The committee recommends that the Surgeon General (1) establish in PHS, and in each of the bureaus which administer grant programs, a single grants management office to provide uniform interpretations of policies and procedures, and (2) provide adequate staffing for PHS's Division of Grants and Contracts to enable this unit, on a current basis, to maintain surveillance over and liaison with the several bureau grants management offices to assure that policies are being properly and uniformly implemented (p. 61).

Recommendation No. 16.—The committee recommends that appointments to advisory councils be limited to one 4-year term, with members ineligible for reappointment, or appointment to other advisory councils, for a period of 4 years following the completion of their terms.

The committee recommends, further, that consideration be given in the selection of advisory committees to obtaining a balanced representation of geographic regions and educational institutions. To the extent possible, consultants should be drawn from among qualified scientists who are not themselves recipients of PHS grants (p. 62).

Recommendation No. 17.—The committee recommends that the percentage of grant funds allocated to the general research support program not be increased, and no new forms of institutional support be initiated, until (1) PHS has modified GRS policies for a more equitable and efficient distribution of these funds, as recommended earlier in this report, and (2) PHS or HEW is prepared to promulgate grants management standards and to determine that institutions wishing to be eligible for research support are in compliance with those standards (p. 69).

II. BACKGROUND

HEARINGS AND REPORTS, 1961–1962

In April 1961, the committee issued a comprehensive report on the health research and training grant programs administered by the National Institutes of Health (NIH), the principal research arm of the Public Health Service (PHS) in the Department of Health, Education, and Welfare. That report,[1] based on more than 2 years of study by the Intergovernmental Relations Subcommittee, identified major areas of weakness in the management of the programs and made a series of recommendations for corrective action.

Among these, the committee recommended specific improvements in NIH's project review system, changes in policies for the support of research in profitmaking organizations and for the support of scientific meetings, better coordination of NIH research activities with those of other Government and private agencies to minimize unnecessary or unintended duplication of research in the health field, greater uniformity and simplification of the policies and procedures for NIH training support programs, and the initiation of a new type of development grant for health professional schools and universities not actively engaged in health-related research. With reference to all Federal agencies supporting research in educational institutions, the committee recommended the establishment of a uniform Government policy on permissible salary practices in the use of Federal funds, and the adoption of an equitable indirect cost policy.

The committee found NIH inadequately organized to administer grant programs with maximum effectiveness. It found, in particular, that NIH had failed to provide for a meaningful review of the financial requirements of new research projects, and that the agency did not maintain sufficient contact with grantees for the purpose of determining appropriate levels of continuation support in relation to project needs and accomplishments. The existing arrangements were not conducive to the prudent use of grant funds.

The agency concurred in general with the committee's findings and recommendations. By correspondence and in public hearings held in August 1961, officials of NIH and the Public Health Service expressed substantial agreement with all but one of the recommendations [2] and indicated their intention to take the necessary corrective actions.

Hearings were held by the subcommittee in March 1962 to examine NIH's progress in implementing the committee's recommendations.

The committee was informed that certain actions had been taken in response to several of its recommendations. First, grants for the support of conferences were no longer treated as research project grants; instead, more restrictive expenditure policies were adopted

[1] *Health Research and Training: The Administration of Grants and Awards by the National Institutes of Health* (H. Rept. 321, 87th Cong., first sess.), hereinafter cited as 1961 report.

[2] PHS disagreed with the recommendation that Congress consider action to permit the awarding of research project grants to scientists employed in VA hospitals on the same competitive basis as to scientists in non-Federal institutions.

for this purpose. Second, NIH broadened the availability of information on its own research work, thereby reducing the possibility of undesirable duplication of research in the health field, by commencing to report its intramural research projects to the Science Information Exchange—the agency which serves as a clearinghouse for grant information on research in the biomedical and other sciences. Third, NIH took action to exclude or negotiate the payment of indirect costs in certain instances where the direct expenses of a project either entail no significant overhead costs or where indirect costs are substantially lower than the maximum rate permitted by law.

However, it became evident in the course of these hearings that NIH had done relatively little to improve the overall management of its grant programs since the committee's report of April 1961. The committee was particularly concerned by the continued absence of sound procedures for determining the initial and the continuing financial needs of grantees.

In the absence of appropriate policies, procedures, and adequate staffing, the nongovernmental scientists who serve on study sections and other review bodies were, in effect, determining the budgetary needs of research projects. Yet, the Director of NIH had testified that these consultants have neither the background, the time, nor the inclination to act as budget examiners. As the committee stated in its 1961 report, the responsibility for obtaining the efficient and economical use of public funds cannot properly be delegated to advisory bodies. This is unquestionably the responsibility of NIH administrators.

The adequacy of NIH policies and procedures for insuring the appropriate expenditure of research funds was tested prior to the 1962 hearings by means of a detailed audit of the grants awarded to Public Service Research, Inc., a company which has received substantial NIH support. The audit disclosed that the company had misused and profited from grant funds and, in general, had used the very broad discretion which NIH allows grantees in expending research money for its own advantage.

The audit also disclosed poor coordination between NIH and the rest of the Public Health Service. NIH continued to pay Public Service Research, Inc., a 15-percent indirect cost allowance on grants after the PHS had established an indirect cost rate of 6.66 percent for the company in connection with a research contract. Following completion of the contract, the Public Health Service permitted the company to retain Government-owned equipment for use in connection with an NIH grant but made no effort to ascertain that the equipment was necessary for the NIH project. Shortly thereafter, NIH awarded a new grant to the company which included funds for the purchase of equipment similar to that which the company already had in its possession from the completed PHS contract.

Because of inadequate administrative arrangements, NIH did not know if grant funds were being expended prudently and for their intended purposes and, consequently, had no factual basis for assuring the committee that the misuse of grants demonstrated in this instance was not widespread among grantees.

In observing that little serious effort had been made to put management improvements into effect, the committee in 1962 concluded:

It is apparent from the subcommittee's recent hearings that weaknesses in the grant programs are due to causes more fundamental than staff inadequacies and faulty procedures. The committee believes these weaknesses are due in large measure to the failure of NIH officials to understand the nature of their responsibility for the management of public funds.

This is reflected in testimony given by the Director of NIH:

> The recipients are selected on the basis of a rigorous screening by their scientific peers. The idea and the man are both examined with care.
>
> This is the point at which the really significant administrative actions designed to make the program efficient and productive are taken. *Selection of good men and good ideas—and rejection of the inferior—is the key. All subsequent administrative actions having to do with the adjustment of budgets, and so forth, are essentially trivial in relation to this basic selection process.*[3]

* * * * *

The committee cannot accept the NIH view that administrative actions for the effective and economical expenditure of grant funds are "trivial" or are matters of little importance. Nor can the committee agree that the choice of the grant rather than the contract as the device for supporting research relieves NIH of normal responsibility for the proper and prudent expenditure of Government funds.

While the manner of obtaining accountability and the required degree of adherence to the research plan may differ under a grant and a contract, the committee believes that a Government agency is equally responsible for the proper, efficient, and economical use of public funds irrespective of the fiscal instrument employed.[4]

The committee then went on to say:

> It appears that the Congress has been overzealous in appropriating money for health research. The conclusion is inescapable, from a study of NIH's loose administrative practices, that the pressure for spending increasingly large appropriations has kept NIH from giving adequate attention to basic management problems. *The committee expects NIH to give high priority at this time to the task of correcting its management deficiencies and strengthening its capacity for the effective and efficient operation of these vital health programs.*[5]

NIH'S ASSESSMENT OF THE PROBLEM

The subcommittee's 1962 hearings apparently jolted the complacency of NIH and stimulated the agency, and the Public Health Service, to engage in some critical self-analysis.

Shortly after the hearings the NIH Director wrote the Surgeon General:

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[3] *Administration of Grants by the National Institutes of Health (Reexamination of Management Deficiencies)* (H. Rept. 1958, 87th Cong., second sess.), p. 14, hereinafter cited as 1962 report.
[4] *Ibid.*, p. 15.
[5] *Ibid.*, p. 26.

> However much we may differ from the specifics of the Fountain committee's viewpoints, and its suggested corrective approaches, there are sufficient instances of error, limitations, and inadequacies in our actions or arrangements to warrant prompt and extraordinary effort on our part to assess, reaffirm or modify both the generalities and specifics of our grant administration process.[6]

The major factors responsible for NIH's administrative difficulties were identified by the Director as follows:

> In the rapid growth of these complex programs a high degree of dependency has been placed upon the advisory councils and other external consulting and technical groups. Although such groups have served a vital and important role, this involvement has tended to blur the important distinctions that must exist between the executive and advisory process in the direction and administration of Federal programs. This problem has in turn diminished the development of adequate program management concepts, staffs, and mechanisms.
>
> The principal instrument for the support of research through NIH programs has been the grant-in-aid. In the growth of our grant programs we have not fully realized the essential nature of the relationship existing between a granting agency and a grantee. As a consequence, our procedures and policies are deficient in making clear the obligation imposed upon grantees under the grant relationship. Nor have we taken adequate steps to make certain that grantee institutions are both capable of and in fact are effectively discharging their responsibilities.[7]

The committee agrees substantially with this assessment. Unfortunately, recognition of the problem was not followed by adequate corrective action.

RECENT DEVELOPMENTS

The committee expressed dissatisfaction in 1962 with NIH's slow progress in strengthening the management of grant programs for health research. We observed that "While NIH has acted in several areas in response to the committee's recommendations, relatively little effort has been made to improve the overall management of these important grant programs." [8]

While some further progress has been made since 1962, the committee is concerned by the failure of NIH, and the Public Health Service as a whole, to maintain high management standards in grant administration.

Using this committee's 1962 report as the frame of reference, a special subcommittee of the House Committee on Interstate and Foreign Commerce found last year, on the basis of its own investigation, little improvement in NIH's management of grants. The subcommittee reported that:

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[6] Memorandum of Apr. 6, 1962, from Director, NIH, to Surgeon General, PHS; Subject: The Fountain Committee hearings. Processed.
[7] *Ibid.*
[8] 1962 report, p. 20.

> Although there have been some subsequent changes in the regulations, such as a requirement for prior NIH approval of changes in plans for equipment costing more than $1,000, this procedure appears perfunctory, and in the view of the subcommittee, there does not appear to have been any substantial improvement in the management by NIH of its grant programs.

The subcommittee added:

> The limited controls imposed by NIH do not appear to be too stringent. The subcommittee's review showed the administration of controls needs further strengthening and clarification and there does not appear to be any justification for exempting investigators supported by NIH from reasonable fiscal controls imposed on other users of Federal funds.[9]

It is evident from hearings held by the Intergovernmental Relations Subcommittee in June 1965, and from a continuous examination of selected grant management activities, that the Public Health Service, and particularly NIH, has not performed its administrative responsibilities adequately. Inadequate management is demonstrated, for example, by the agency's inept handling of indirect cost payments to grantees and its extremely poor administration of the general research support and health sciences advancement award programs. These and other problem areas are examined in the chapters which follow.

[9] Report of the Special Subcommittee on Investigation of the Department of Health, Education, and Welfare of the Committee on Interstate and Foreign Commerce, *Investigation of HEW* (H. Rept. 2266, 89th Cong., second sess.), p. 130.

III. INDIRECT COSTS

INDIRECT COST OVERPAYMENTS

In April 1961, the committee recommended that "No overhead be allowed on grants or grant items which do not entail actual indirect expenses, and an amount less than the regular rate be allowed when extramural research requires few institutional services." [10]

Special attention was called to the fact that medical schools were being paid the full 15 percent indirect cost allowance—which was then the legal maximum—on more than $2.3 million in grants made by NIH for the support of research projects in VA hospitals. The Government, therefore, paid overhead twice on these projects, once to the medical schools for their part in administering the grants, and again in the form of appropriations for the upkeep of VA laboratories and clinical facilities used for the performance of these projects.

The Public Health Service subsequently agreed that the indirect cost rate for grants of this kind would be negotiated to reflect the true expense to the schools for their limited administrative role. The PHS also agreed to pay lower negotiated rates for other types of grants to which the committee's 1961 recommendation applied, such as grants which included funds for the rental of furnished quarters or computer time where the rent figure already contained an indirect cost factor.

One year later, following subcommittee hearings, the committee made the further recommendation:

> Until a uniform Federal policy is established and as long as NIH operates under a maximum indirect cost rate determined by the Congress, the committee recommends that NIH: (1) Pay no more than the actual indirect cost rate for any institution having a lower rate than the maximum set by the Congress; and (2) Prohibit the use of direct grant funds to defray employee benefit costs unless the usual accounting practices of the institution properly and consistently treat these costs as direct expenses.[11]

It had been disclosed in the subcommittee hearings that NIH had uniformly paid a grantee, Public Service Research, Inc., the full 15 percent allowance for the indirect expenses of research supported by grants despite the fact that the Public Health Service had allowed the same organization only 6.66 percent for the indirect costs of research performed under an audited contract.

Shortly after the committee issued its 1962 report, the 1963 Appropriation Act for the Department of Health, Education, and Welfare increased the maximum indirect cost rate from 15 to 20 percent with instructions that the Department was to allow no more than any institution's actual rate if less than 20 percent.

[10] 1961 report, p. 75.
[11] 1962 report, p. 24.

The conference report, dated July 31, 1962, stated:

> The committee of conference desires that the Department carefully review the expenses incurred under research grants with a view to allowing no more than the actual expenses for indirect costs in cases where such indirect costs amount to less than 20 percent of the direct costs.[12]

The conference report made explicit what had previously been the intent of Congress in setting a statutory ceiling up to which grantees could be reimbursed for their indirect research costs.

On August 20, 1962, the Public Health Service issued a policy directive (PPO No. 39) to apply the 1963 Appropriation Act's indirect cost provision to grants awarded on or after January 1, 1963. That document stated in part:

> 5. At the time the grant is made, the award will include an allowance for indirect cost based on a provisional rate. This provisional rate will be consistent with the latest accepted audited rate (but not to exceed 20 percent of total direct costs) for the institution, where such information is available. In those institutions where an audited rate has not been established, a provisional rate of 15 percent will be applicable.
>
> 6. In order to assure uniformity in authorizing provisional rates, a current file is being established centrally of the latest approved rates for all institutions for which such information is available. These rates will be applied consistently by all divisions and institutes of the Public Health Service in making awards for research grants.

PPO No. 39, therefore, established the policy of basing indirect cost allowances on provisional rates that were to be consistent with the latest audited rates, up to 20 percent, for those institutions for which information was available.

This policy, however, did not become effective in January 1963. Instead, the Public Health Service informed its staff[13] to apply a 20-percent indirect cost rate on all research grants with the following notation on award notices: "Computed at 20 percent of allowable direct costs, subject to reduction of total grant if the institution's substantiated indirect cost rate is determined to be less than 20 percent." A later PHS policy directive,[14] made retroactive to January 1, 1963, continued the existing arrangement of a 20-percent provisional rate subject to later adjustment if an institution's actual rate was found to be less than 20 percent.

Contrary to the congressional intent explicitly stated in 1962, and contrary to HEW's stated policy of relying "to the fullest extent possible on indirect cost rates of institutions established by cognizant Federal agency audits," [15] Public Health Service units continued the practice of including a 20-percent allowance for indirect costs in grant payments until 1965.

The Surgeon General explained the Public Health Service's position in this way:

[12] Rept. 2100 to accompany H.R. 10904.
[13] PPO No. 62, Jan. 4, 1963.
[14] PPO No. 76, June 20, 1963.
[15] Policy statement, "Cost Principles—Research Grants," transmitted to Surgeon General by HEW Comptroller's memorandum of Jan. 18, 1963.

In January 1963, the Comptroller, Department of Health, Education, and Welfare, issued a policy statement governing determinations of indirect cost rates for research grants. Following the issuance of the Department's policy statement, efforts were begun to obtain actual indirect cost rates for all grantee institutions.

Available specialized fiscal staff resources of the Service also began working on the development of implementing procedures with the office of the Secretary, providing grantee institutions with an opportunity to comment on these procedures, and finally preparing policy issuances.

One of the final implementing actions in this admittedly long developmental process is exemplified in a December 1964 memorandum by the Associate Director, NIH, requiring the use of listed indirect cost rates on all awards made by NIH.

In the interval between January 1963 and the final issuance of servicewide implementing directives, grants personnel of the PHS were permitted to pay the full 20-percent rate authorized by the Appropriation Act, but grantee institutions were made aware that the rate on the grant award was a provisional one, subject to audit; and that if the actual audited rate were found to be less than the provisional rate, overpayments were subject to recapture.[16]

The PHS's long delay in implementing the Government's policy to pay actual indirect cost rates, within the 20-percent limitation, was responsible for extensive overpayments of grant funds and for creating needless friction between the agency and grantee institutions. Such overpayments have been wasteful both in the additional interest costs to the Government and in the expense of obtaining repayment.

Congressman Fountain emphasized this point in hearings:

> I would like to say that apparently we haven't been successful in conveying the message that there is a world of difference between paying the appropriate indirect cost rate and paying a higher rate with the expectation that the surplus would be recaptured at some future time when the grant has been audited.
>
> In fact, even in these hearings I seem to detect an attitude that no harm is done in paying excessive rates if you tell the grantee that the rate is provisional until audited.
>
> I would like to say that for one thing, it is only natural that grantees don't like to return money to which they have become accustomed. And, as a result, you have encountered considerable difficulty in recapturing overpayments in a number of instances. In fact, the problem would never have arisen if you paid the correct rate.
>
> But even more important, it seems to me, is the obvious fact that overpayments create interest costs to the Government. The interest on our national debt—and I think it is important to emphasize this occasionally—now amounts to $11.3 billion a year. This expense is the second largest

[16] 1965 hearings, p. 6.

item in the Federal budget, exceeded only by national defense.

I am sure that it is not the intent of the Congress that your agency give grantees the use of Government money to which they are not entitled until such time as overpayments can be recaptured, or under any other circumstances.[17]

Mr. Fountain added:

And speaking of the management of Government funds, I am reminded of the NIH practice not too long ago of advancing the full amount of an annual grant in a lump sum. One celebrated case brought to my attention was the advance of $575,000 to the American Hospital Association in January 1957 for a project which never got off the ground. That money was deposited in a checking account in a Chicago bank for a period of 2 years and 2 months, until the unspent balance of $545,342 was returned to NIH on March 30, 1959.

The Treasury Department has informed the subcommittee that the Government's interest cost for the unspent balance amounted to approximately $42,000 for the 26-month period that the funds were idle. That is quite a price to pay for this so-called provisional payment which, so far as I am concerned, is a form of carelessness.

The project itself, I might add, was one which was approved by a special study section with a very low priority rating.[18] The review committee, it should be noted, recorded only a six-line comment in recommending to commit $575,000 a year for 5 years, a total of $2,875,000.

I am aware of the fact that NIH has progressed from making annual grant payments to quarterly advances, and is now making use of the letter of credit for some larger institutions, which I think is a real improvement. But even the letter of credit will not eliminate unnecessary interest expense if payments for indirect costs are made at a higher than actual rate, or if grant payments are otherwise improper.[19]

In March 1963, Subcommittee Chairman Fountain wrote to Surgeon General Terry inquiring whether NIH contracts with a large grantee, Health Research, Inc. (Albany and Buffalo, N.Y.), provided for indirect cost rates ranging from 8 to 11.4 percent for the fiscal years 1958 through 1961, during which NIH paid that organization a 15-percent indirect cost rate on research grants. The Surgeon General confirmed these rates and, in response to a further inquiry, identified eight additional grantee organizations which had received payments for their indirect costs of grant-supported research at rates in excess of their true rates known to the Public Health Service and used for contract purposes.

After obtaining legal advice, the Surgeon General agreed in July 1963 that payments in excess of an organization's actual indirect cost

[17] 1965 hearings, pp. 74–75.
[18] Rated less than average quality.
[19] 1965 hearings, p. 75.

rate were not permissible and therefore subject to recovery.[20] He further stated that each of the cases in question would be reviewed to determine the amount of the Government's claim.

The Public Health Service developed partial claims for the recovery of indirect cost overpayments to most of these grantees during 1963 and 1964. In a number of instances, however, the claims could not be calculated because the agency lacked essential financial data; this situation, regrettably, has still not been corrected.

The Public Health Service originally estimated the overpayments to Health Research, Inc., at $898,518 for the fiscal years 1958–64. When the subcommittee inquired why NIH had continued to pay indirect costs to this grantee in excess of the latter's known provisional rate after receiving legal advice that such larger payments were unauthorized, the Public Health Service investigated, found that some Cancer Institute payments had been made at the proper rate, and concluded that the estimate of overpayments was too high. The committee was informed by PHS that the actual overpayments of indirect costs to Health Research, Inc., amount to $412,208 for the fiscal years 1958–63; additional amounts are being calculated for the years 1964–66.

However, after reviewing the agency's computations, the GAO has advised the committee that NIH's overpayments of indirect costs to Health Research, Inc., are understated by approximately $84,200; actual overpayments for the years 1958–63, therefore, total almost a half million dollars.

NIH continued to overpay Health Research, Inc., for indirect costs even after the Surgeon General had initiated action in 1963 to recover the overpayments made in previous years. In fact, NIH institutes, with the exception of the Cancer Institute, persisted in making such excessive payments as late as the middle of fiscal year 1965. The absence of uniform administration in this case was attributed in the following exchange to the existence of a highly decentralized NIH organization:[21]

> Dr. GOLDBERG. Why did the Cancer Institute make grants at a lower rate than 20 percent? Did they do this on their own initiative?
>
> Dr. SHERMAN. Yes, sir.
>
> Dr. GOLDBERG. Is the National Institutes of Health so decentralized an organization that each of the Institutes can go its own way in a matter of this kind?
>
> Dr. SHERMAN. I would qualify your answer and my response, Dr. Goldberg, by saying indeed it is necessarily a very highly decentralized organization. And in this instance, there is a good reflection of that.

[20] The Department's Assistant General Counsel, in an opinion dated Apr. 3, 1963, wrote:
"The authority to make a grant or gift of Federal funds is an extraordinary one; it must be expressly authorized by the Congress and strictly construed so as to limit the use of granted funds to the authorized purposes. Unlike a lump sum or a cost-plus-fee contract, there can be no 'profit' to the grantee from funds granted for a research project. Any amounts paid in excess of what is needed for the project must be returned to the United States since, by definition, the excess is not needed for the project and so the grant of the excess is unauthorized. Unless authorized by Congress, no official of the executive department can waive these principles or 'agree' to the contrary." The complete opinion appears in the subcommittee's 1965 hearings, pp. 59–60.

[21] 1965 hearings, p. 62.

It was brought out in questioning that the Surgeon General was not aware of the differing practices being followed by the NIH institutes in dealing with a single grantee:[22]

> Dr. GOLDBERG. Were you aware in this case that the Cancer Institute and the other Institutes were going their separate ways in setting indirect cost rates on grants to Health Research, Inc.?
>
> Dr. SHERMAN. I must confess that part of this took place during my predecessor's term in office and when I assumed that office, I was not aware of this.
>
> * * * * *
>
> Dr. GOLDBERG. If this differential application of policy goes on within the National Institutes of Health, as illustrated by this case, and the Office of the Director is not aware of it, would it be fair to surmise that the Surgeon General doesn't know about it either?
>
> Dr. SHERMAN. I would certainly think so, sir.
>
> Dr. TERRY. I did not know about it, sir.

The subcommittee was informed that the NIH Director, not the Surgeon General, was responsible for seeing that a grantee was no longer given excessive indirect cost payments once the decision had been made to recover past overpayments:[23]

> Dr. GOLDBERG. As of the time the claim was made and the Public Health Service was satisfied that overpayments had indeed been made, was any action taken to see that from that point on the operating bureaus, and the institutes and divisions within NIH, would pay the predetermined rate and not continue to pay at 20 percent? * * *
>
> Mr. SIMPSON. * * * With respect to the continued payment to Health Research, Inc., of the audited indirect cost rate, we did not take any steps in the Office of the Surgeon General as such. This rate was well known in the Financial Management Branch in the Office of the Director of NIH. From that time on they were the ones working with it.
>
> Dr. GOLDBERG. Is it your position that it was the responsibility of NIH to have taken appropriate action?
>
> Mr. SIMPSON. Yes, sir.

Fiscal year 1965 data were examined for nine additional organizations and institutions whose actual indirect cost rates were known by the Public Health Service to be lower than the 20 percent statutory maximum. Seven of these grantees received indirect cost allowances on NIH grants at rates above their provisional rates established by Government audit; in almost all instances the grantees were paid the 20-percent rate.[24]

In view of NIH's inability to provide the subcommittee a statistically significant sample of 1965 grants to one of the seven grantees, the University of California, for off-campus research projects (only two grants, exclusive of projects conducted in VA hospitals, were identified) the subcommittee requested the General Accounting Office to review

[22] *Ibid.*, p. 64.
[23] *Ibid.*, pp. 67–68.
[24] *Ibid.*, p. 124. See app. 1.

NIH's records to determine if such information was available. The Comptroller General reported to the subcommittee as follows:

> In our analysis of agency grant files pertaining to 282 of the 488 fiscal year 1965 grants in support of investigators at the Berkeley and Los Angeles campuses of the University of California, we found that information in the files was not sufficient in all cases to permit a positive identification of those research projects that were conducted in whole or in part at off-campus locations. However, we were able to identify 43 grants which were for projects indicated to have been conducted off campus or partly off campus but which included indirect cost allowances at the on-campus rates. For 10 of these projects indicated to have been conducted wholly off campus, we estimate that indirect cost allowances were about $11,000, or about 57 percent greater than the amount which would have been awarded had the off-campus rates been applied. Available information was not sufficient to enable a similar comparison for those projects indicated to have been conducted partly off campus.
>
> We also examined into the efforts made by the National Institutes of Health to furnish information requested by the subcommittee on off-campus projects at the University of California. We found that, while efforts had been made to obtain the requested information, the steps taken were not properly designed for identifying off-campus projects to the extent possible on the basis of available information. The Public Health Service did not consider the information obtained through these steps to be responsive to the request and accordingly did not transmit the information to the subcommittee.
>
> We believe that a positive identification of the location of the conduct of research projects financed through Public Health Service grants would not be possible on the basis of existing Public Health Service records. In the interests of guarding against this situation in the future and of enabling a proper determination to be made of the amount of indirect costs applicable to Government sponsored research, we believe that the Public Health Service should require grantees to state in their grant applications the location or locations at which the research will be performed and the portion to be performed at each location and to subsequently report the location or locations at which the research was actually performed.[25]

The Public Health Service assured the subcommittee, in May 1965, that it would comply with the subcommittee's suggestion for the maintenance of a master list of indirect cost rates, including off-campus rates, to be used by all institutes and divisions which award grants. This function has since been taken over for all of HEW by the Office of the Comptroller. That Office negotiates indirect cost agreements with grantee institutions and provides indirect cost rate information to PHS on a current basis.

[25] Report by the Comptroller General, June 30, 1966. See app. 2, for complete report.

The committee strongly recommends that the Surgeon General make suitable arrangements to assure the uniform application of the Department's indirect cost rate information by all granting units of the Public Health Service. With respect to the use of off-campus rates, which are normally lower than on-campus rates, the committee recommends that the Public Health Service obtain sufficient information in grant applications and in subsequent reports to identify the locations at which the research is performed.

The Public Health Service sought to explain its failure to comply for more than 2 years with the congressional mandate to pay no more than a grantee's actual indirect costs by claiming that the problem was complex. Specifically, it held that many of the rates established by cognizant Government agencies, particularly the Department of Defense, were inappropriate for PHS purposes and unacceptable to grantees.

The committee recognizes that some DOD and other rates available in 1963 were insufficiently precise for PHS purposes. These, however, were for the most part exceptional cases. In the great majority of instances where the rates established by Government agency audits were lower than the 20-percent statutory limitation, their use as provisional rates would have been proper and would have avoided the overpayments made. Moreover, the committee finds it inexcusable that NIH and other units of the Public Health Service consistently paid the 20-percent maximum rate to grantees with which these same units had negotiated research contracts providing for lower rates determined by Government audit.

In the committee's judgment, the Public Health Service should have been prepared in 1963 to implement the Congressional mandate to pay no more than a grantee's actual indirect costs. The subcommittee had questioned the Public Health Service as early as 1960 about the suitability of DOD financial audits and DOD established indirect cost rates for health research purposes. The PHS advised the subcommittee in January 1961 that the use of DOD audits appeared to be the most practical arrangement but that the PHS would continue to consider the suitability of such audits in relation to its needs.[26] The necessity of limiting indirect cost payments to a grantee's actual rate established by Government audit was then brought forcefully to the PHS's attention by the subcommittee hearings held in March 1962 and, again, by the committee's June 1962 report and the Appropriation Committee directive of July 1962.

STEPS FOR IMPROVING INDIRECT COST RATE DETERMINATIONS AND FINANCIAL AUDITS

On July 1, 1965, the newly created HEW Audit Agency assumed responsibility for auditing grants and contracts awarded by the Public Health Service and all other organizations in the Department. Although separate audit units were maintained for internal auditing of the Public Health Service and the Social Security Administration, only the Department's central Audit Agency now deals with grantees and contractors. The comprehensive audit program planned by the Audit Agency should make for a more adequate and meaningful re-

[26] 1965 hearings, p. 89.

view of grant expenditures than in the past. The committee has been informed that it is the goal of this Agency to conduct comprehensive audits of grantee institutions in order to provide program officials with information as to the adequacy of their instructions to grantees and the extent of compliance, as well as with information relating to the accountability of grant funds. The committee strongly endorses this approach.

While unified external auditing has now been achieved for HEW, the committee is concerned by the absence of unified auditing arrangements for the Federal Government as a whole. Such unified auditing would be beneficial not only to the Government, but also to educational institutions and other performers of Government-supported research.

Institutions and organizations that receive Federal research grants and contracts have been confronted with the necessity of preparing and submitting separate indirect cost rate proposals to each of the awarding Federal agencies. The form of submission, the submission date, and the method of handling submissions may vary among Federal agencies. At times, the recipient institutions have also been subject to separate financial audits and separate rate negotiations performed by several Federal agencies. The duplicating nature of much of this effort has militated against efficient utilization of available Government resources for coping with a very substantial workload.

The committee is aware that the Department of Health, Education, and Welfare has recently established cooperative work-sharing arrangements with the Defense Contract Audit Agency for the performance of audits. Interim work sharing relationships have also been worked out among HEW, the Department of Defense, and the National Science Foundation for the establishment of indirect cost rates with grantees and contractors.

These arrangements currently provide that where the Defense Contract Audit Agency is performing audits at an institution in connection with Defense business, HEW-supported work will also be included in the audit. They further provide that where the Department of Defense is negotiating indirect cost rates with the institution, HEW will participate in such negotiations and will be bound by the results. The Department of Health, Education, and Welfare and the National Science Foundation have agreed that HEW will assume responsibility for establishing rates with larger educational institutions not handled by DOD, with hospitals not handled by DOD, with State and local agencies, and with health-related nonprofit organizations. The NSF will assume responsibility for smaller educational institutions and for non-health-related, nonprofit organizations.

The committee is also aware that the Committee on Academic Science and Engineering of the Federal Council on Science and Technology has established a subcommittee to work for the extension of these cooperative audit and indirect rate negotiation arrangements on a Government-wide basis. The ultimate objective of this effort is to obtain single agency responsibility for establishing indirect cost rates with all insitutions of a given type based on which agency does the preponderance of business. HEW, for example, would have responsibility for all hospitals.

This plan would avoid needless duplication of effort, provide for performing the needed tasks economically, and present a single Federal "face" when dealing with grantees and contractors. Assignment of single agency responsibility to the agency with the preponderant dollar interest would insure priority of attention and would also insure that audits and negotiations are grounded in a thorough understanding of the programs involved.

The committee endorses the concept of assigning Government-wide responsibility for establishing indirect cost rates with all institutions of a given type to a single Federal agency, with each type of institution audited by one Federal agency only. The committee recommends that this concept be vigorously pursued by the Bureau of the Budget and other interested agencies so that a final Government-wide plan covering all institutions will expeditiously be established.

IV. GENERAL RESEARCH SUPPORT GRANTS

Public Law 86–798, enacted September 15, 1960, amended the Public Health Service Act [27] to authorize grants to universities, hospitals, laboratories, and other public or nonprofit institutions for the general support of their research and research training programs. The funds for these grants are obtained by setting aside a uniform percentage, not to exceed 15 percent, of the appropriations to NIH for research grants authorized by existing legislation. The amount of the grant to each eligible institution is to be determined in accordance with a formula developed by the Surgeon General after consultation with the National Advisory Health Council.

In reporting the bill which authorized the new program, the House committee explained the need for and objectives of this legislation as follows: [28]

> The research and research training programs of the National Institutes of Health and of other Federal agencies have now grown to a point where their size and scope exert a profound influence upon the medical schools and other institutions within which the individual investigators work.
>
> * * * * *
>
> A study of this problem of institutional impacts and relationships recently carried out by the Public Health Service concluded that the increasing dependence upon project grants as a form of research support has tended to deprive medical schools of a substantial measure of control over the content, emphasis, and direction of their research activities. Because such funds are restricted in terms of the specific projects for which they can be employed, they have limited the discretion of the schools to meet emerging opportunities in research, to explore new and unorthodox ideas, and to use research funds in ways and for purposes which they, in their judgment, feel would contribute effectively to the furtherance of their research program.

General research support (GRS) grants were initiated in 1962 with awards limited in the first year to professional schools of medicine, dentistry, osteopathy, and public health. Somewhat more than 5 percent ($20 million) of NIH appropriations for research projects was made available for the program in fiscal year 1962. In fiscal 1963, the program was extended to include schools of pharmacy, nursing, and veterinary medicine, as well as hospitals, research institutes, and other nonprofit organizations heavily engaged in health-related research. About 7 percent ($30 million) of the NIH research grant budget was made available for general research support in 1963. By 1967, the program had stabilized at approximately 8 percent ($51.7 million) of the funds appropriated to NIH and NIMH for research grants.

[27] 42 U.S.C. 241(d).
[28] House of Representatives Rept. 2174, to accompany H.R. 10341 (86th Cong., second sess.), pp. 2–3.

Beginning in fiscal year 1966, general research support was extended in the form of a new biomedical sciences support grant to graduate institutions, such as schools of arts and sciences, engineering, and agriculture, extensively engaged in research supported by NIH grants.

A completely new program, the health sciences advancement award, was also initiated in 1966 under the authority, NIH said, of the general research support legislation. The announced purpose of this program is to aid in the implementation of specific proposals through which selected graduate academic institutions may raise the stature of their biomedical research and research training activities. Institutions eligible for awards under this program are universities, or their major organizational units, colleges which grant master's or doctor's degrees, and health professional schools which are not part of a university.

An institution or organization in one of the eligible categories may qualify for a GRS grant if it has received at least $100,000 of NIH research grants in the previous fiscal year, provided that the research supported by such grants is judged to be of sufficient diversity, complexity, and breadth. This minimum requirement, however, does not apply to the four types of professional schools which were made eligible for grants in 1962. Each of these schools is automatically given a $25,000 base grant in addition to any amount it would receive under the grant formula.

The amount of a GRS award is based on a grantee institution's total health-related research expenditures during its last preceding fiscal year according to the following computation:

(1) 5 percent of the first $1 million or less and 3 percent of the amount between $1 and $2 million of expenditures from research grants and contracts sponsored by Federal agencies, plus

(2) 10 percent of the first $1 million or less and 6 percent of the amount between $1 and $2 million of expenditures sponsored by non-Federal gifts, grants, and contracts specifically restricted for research.

(3) The amount available to any institution on the basis of this computation, plus the base grant for the professional schools, is increased (or decreased if necessary) by whatever uniform proration factor is required to adjust the total amount of all awards to the total funds available for the GRS program.

An indirect cost allowance was added to the grant in the first several years of the program, but was discontinued in fiscal 1965 when the Appropriation Act prohibited such payments.[29]

A biomedical sciences support grant is determined quite differently. Here a higher minimum of NIH research project grants ($200,000) is the basic qualifying requirement, and the size of the award is determined by the amount of research project grants the institution has received from NIH alone. The quality and scope of an institution's health research activities, as judged by advisory groups, are other qualifying criteria.

The amount of the award is derived by the following formula:

15 percent of the first $200,000 in NIH research project grants, plus

7 percent of the amount from $200,001 to $500,000, plus

[29] *Departments of Labor and Health, Education, and Welfare, and Related Agencies Appropriation Bill, 1966.* Conference Report. H. Rept. 1880 (88th Cong., second sess.), Sept. 2, 1964, p. 3.

3 percent of the amount from $500,001 to $1 million, plus
2 percent of the amount over $1 million.

The sum of the amounts produced by application of this formula is increased or decreased by whatever uniform factor is required to adjust the total amount of the awards to all institutions to the total funds available.

The health sciences advancement award, in turn, is a nonformula project-type grant for the implementation of specific development plans. It is awarded to selected institutions for a project period not to exceed five years. Preference is given, according to NIH, to applicant institutions which show the greatest promise for advancing the excellence of their biomedical research and training activities.

Although the committee has made only a limited study of the general research support program, certain weaknesses are apparent.

First and foremost, the effort given to developing policies for the new program was not matched by careful implementation of those policies. The cases examined by the committee show that program management has been less than adequate. The case of Health Research, Inc. is illustrative of this point.

In late 1962, Health Research, Inc., a private nonprofit research organization associated with the New York State Department of Health, applied to NIH for two grants under the general research support program, which was being extended to research organizations beginning in 1963. The organization applied for separate grants for its Albany and Buffalo divisions.

In both applications, Health Research, Inc., reported as its expenditures large sums of money appropriated by New York State for the operation of two units of the State department of health. These expenditures were reported, and counted by NIH in computing the grants, despite the Public Health Service's explicitly stated policy on the funds which may be counted toward entitlement. Under the PHS policy——

> Each institution bears responsibility to report as expenditures only those funds awarded to, or those *clearly intended for*, that particular institution.[30]

The State appropriations for the health department's Division of Laboratories and Research in Albany, and for Roswell Park Memorial Institute in Buffalo, were counted, according to official testimony, because NIH at the time thought Health Research, Inc., was part of the State government. Speaking for NIH, Dr. Frederick Stone said:[31]

> A year and some months, perhaps 2 years later, we are in a position after extensive staff work on this, including visits of which you have heard of some, but you haven't heard of all of them yet, it is clear to the staff that the appropriation was not made to HRI, and actually I believe did not even pass through HRI for expenditure. The documents that I had at my disposal at that time were not clear to me.

Curiously, however, NIH did not at the same time allow Health Research, Inc., to include in its application an additional State appropriation of almost $2 million on the grounds that these funds were not

[30] *General Research Support, A General Policy and Information Statement.* Pt. I, revised September 1963, p. 4.
[31] 1965 hearings, p. 109.

awarded to or clearly intended for the grantee. The disallowance was explained by NIH as follows: [32]

> In furnishing information preliminary to its formal application for a 1963 general research support grant, the Albany Division of Health Research, Inc., included under expenditures a total of $3,270,125 in New York State appropriated funds. Of this amount, $1,947,495 was disallowed by the General Research Support Branch because it represented amounts paid by New York State through the State department of health to cities and counties as matching funds for approved health research programs carried out by those cities and counties. Under the policy of the general research support program, each institution bears responsibility to report as expenditures only those funds awarded to, or those clearly intended for, that particular institution. Because the New York State appropriated funds in question were neither appropriated to nor clearly intended for Health Research, Inc., the funds were not allowed to be included in the formal application which was filed on December 11, 1962.

General research support grants were made to Health Research, Inc., in the first 2 years as follows:

	1963	1964	Total
Albany division	$166,605	$241,717	$408,322
Buffalo division	311,491	421,630	733,121
Total	478,096	663,347	1,141,443

The following amounts of State appropriated funds to units of the State department of health were included in computing these grants:

	1963	1964
Division of Laboratories and Research	$1,170,562	$1,286,980
Roswell Park Memorial Institute	2,215,126	2,305,891

If these State appropriations had not been included in applying the grant formula, Health Research, Inc., would have received the following amounts:

	1963	1964	Total
Albany division	$25,188	$37,298	$62,486
Buffalo division	179,597	251,490	431,087
Total	204,785	288,788	493,573

Consequently, the State appropriations that were improperly counted in determining the grant amounts resulted in overpayments as follows:

	1963	1964	Total
Actual grant payments	$478,096	$663,347	$1,141,443
Entitlement	204,785	288,788	493,573
Overpayments	273,311	374,559	647,870

Even if State appropriations were allowable, Health Research, Inc., would have been overpaid approximately $408,000 for 1963 and

[32] *Ibid.*, p. 111.

1964 because NIH made separate grants each year to the organization's two divisions, thereby exceeding the dollar limit which the formula places on every institution's GRS grant.

In applying for 1964 GRS grants, Health Research Inc., reported sponsored research expenditures totaling $1,690,115 for the Albany division, of which $1,286,980 was shown as State appropriations restricted for research. By treating these State government expenditures as its own, the organization received a grant of $241,717 for a year in which it received a total of only $201,547 in NIH project grants. The single item of almost $1.3 million accounted for the bulk of Health Research, Inc.'s, general research support grant under the formula which gives double weight to funds from non-Federal sources.

In light of the purpose for which the program was enacted—namely, to help correct institutional imbalances created by project grants—it is obvious that this result is not what the Congress intended. The overpayments in this case are a windfall to the grantee never intended by the general research support legislation.

Such windfalls benefit principally nonprofit research organizations, rather than educational institutions, since most of their income from non-Federal sources is restricted for research purposes and therefore taken into account by the GRS grant formula. It is ironic that research organizations should be the main beneficiaries of this largess inasmuch as the legislation authorizing the GRS program was justified as a means of helping medical and other schools redress imbalances in their total research and research training activities created by Federal support of individual research projects.

The distortion of the program's purpose is illustrated also by a somewhat different case. In 1964 Stanford Research Institute received a GRS grant of $208,218 in comparison with only $517,218 in all other NIH grant support. On January 1, 1965, the Public Health Service had active research contracts with Stanford Research Institute for which the latter was receiving approximately $70,500 in fees. And these same contracts constituted a substantial part of the expenditures base on which the organization's GRS grant was computed.[33] Oddly enough, the GRS policies do not provide for excluding from the grant computation those expenditures under Federal research contracts for which a nonprofit organization has already been paid a fee—largely in recognition of its need to engage in self-sponsored research.

In the light of its failure to ask the right questions, NIH may have had reason to view Health Research, Inc., as a State agency when the latter applied for 1963 GRS grants. However, NIH's acceptance of New York State appropriations for grant entitlement purposes when the organization applied for 1964 funds is wholly inexcusable. By mid-1963 NIH had been notified by the Office of the HEW General Counsel that Health Research, Inc., "is a private agency, separate and apart from the State, a legal entity unto itself." This legal opinion served as the basis for the Surgeon General's decision in July 1963 to recover indirect cost payments on research grants in excess of Health Research, Inc.'s, actual overhead rates.[34]

It was not until the 1965 grants were made that NIH recognized Health Research, Inc., as a private agency for GRS purposes. NIH

[33] 1965 hearings, p. 114.
[34] *Ibid.*, p. 95. Letter from Dr. Luther L. Terry to Hon. L. H. Fountain, July 12, 1963.

then disallowed the New York State appropriations, which had been previously counted in computing the grants, on the grounds that these appropriations were not made to Health Research, Inc., and the organization did not exercise any fiscal or managerial control over them.

As a result, the grants made to the Albany and Buffalo divisions of Health Research, Inc., for 1965 were reduced to $47,617 and $266,870, respectively, and for 1966 only a single composite grant of $268,665 was awarded.

For 1967, however, NIH again reversed itself and made two separate grants to Health Research, Inc., with State appropriations to Roswell Park Memorial Institute and the Division of Laboratories and Research once more counted in computing the grant amounts. These grants were technically awarded to the Albany and Buffalo units of the New York State Department of Health but paid to Health Research, Inc., as "fiscal agent." The naming of a payee other than the applicant for receipt of the grant was made possible by a July 1966 revision of PHS's policies for the GRS program.

As a result of this decision, the Albany and Buffalo divisions of Health Research, Inc., received $161,053 and $416,133, respectively, for 1967.

To reemphasize the distorting effect of taking non-Federal research funds into account in computing GRS grants, the $161,053 award to the Albany division in this instance is based on expenditures of only $170,077 from NIH grants and only $292,642 from all Federal sources combined. The size of the GRS grant was determined mainly by counting $769,165 appropriated by New York State for payroll and other research expenses of the health department's Division of Laboratories and Research.

The committee is surprised by the casualness with which the GRS program has been administered. We believe it NIH's responsibility to develop policies and guidelines which clearly define the conditions under which grants are to be awarded, and then to administer those policies conscientiously and equitably. This was not done in the GRS program. It is disquieting, moreover, to find policies so vague as to permit the award of either one or two grants each year to a single organization at the program administrator's discretion.

To eliminate some of the abuses that have developed in the general research support program, ***the committee recommends that program policies be changed immediately to:***

(1) Determine each GRS grant on the basis of the recipient institution's research expenditures from Federal sources alone. The committee does not believe the premium given for non-Federal research funds under the existing formula operates as a meaningful incentive for institutions to seek private funds. Rather, this premium favors research organizations over institutions of higher education, and has been difficult to administer and wasteful of Federal research money, and

(2) Exclude from the computation base for a GRS grant all Federal payments for research which include fees above actual research costs.

Other recommendations concerning the GRS program are made in chapters VII and VIII.

V. HEALTH SCIENCES ADVANCEMENT AWARD

As previously noted, the health sciences advancement award (HSAA) was formally initiated in 1966 under the presumed authority of the general research support legislation. The announced purpose of this program, however, is very different from the purpose for which GRS legislation was enacted.

While the latter was intended to establish a system of continuing general-purpose grants, determined by a uniform formula, to supplement each eligible institution's grants for specific research projects, the HSAA program was initiated to provide special-purpose grants to selected schools for "increasing the number of excellent research and training programs in graduate academic institutions." [35] The HSAA program is intended "to aid in the implementation of specific proposals whereby institutions can advance to higher levels of achievement by developing new and strengthening existing health science activities." [36] In short, its purpose appears to be similar to that of the National Science Foundation's university science development program—to create additional "centers of excellence."

The first public announcement of the new grant programs was NIH's issuance of the document *Health Sciences Advancement Award, General Policy and Information Statement,* dated April 1966. A brief preliminary announcement was submitted for publication in the April 22, 1966, issue of *Science.* Both of these announcements specified July 15, 1966, as the deadline for application.

Nevertheless, applications for HSAA awards were received from three institutions a year earlier, in May 1965, and two of these institutions were awarded grants officially approved by the National Advisory Health Council on September 28, 1965, but held in abeyance until a public announcement had been made on the establishment of the new program.

Precisely when these three institutions were invited to submit applications is not clear, but NIH staff met with their representatives on April 28 and 29, 1965, for the purpose of discussing the HSAA program. At these meetings "each of the institutional representatives agreed that the suggestions made would be considered in redrafting their proposals" and that a draft from each of the institutions would be in NIH hands in 2 weeks.[37]

An ad hoc Health Sciences Advancement Award Scientific Advisory Committee met at NIH on June 1, 1965, to review the resulting applications from Cornell University, the University of Virginia School of Medicine, and the Graduate Research Center of the Southwest.

The role of the ad hoc committee was confined to the technical evaluation of the strengths and weaknesses of the program proposed

[35] NIH press release, June 11, 1966.
[36] *Health Sciences Advancement Award, General Policy and Information Statement,* an administrative document issued by the General Research Support Branch, Division of Research Facilities and Resources, National Institutes of Health, April 1966.
[37] NIH "Memorandum of Meetings," dated May 1, 1965.

by each applicant. The chairman observed that it was not the committee's responsibility to make the rules or to determine an applicant's eligibility for the program.

The origin of the three applications was not considered by the committee except for the following inquiry: [38]

> COMMITTEE MEMBER. There is something I would like to know more in curiosity than anything else because I think it bears on what kind of attitude we should take toward this.
>
> We have only three applications. The program wasn't announced, and I don't know what the mechanism was for getting these three applications into the hopper, but were they asked or suggested to them that they apply, or did they hear about the program and ——
>
> NIH OFFICIAL. It was suggested to them, each and every one, that they apply at least by some official in the Public Health Service.
>
> COMMITTEE MEMBER. It was a trial balloon you wanted to try out?
>
> NIH OFFICIAL. This was a trial balloon. And you realize you have three quite dissimilar applications here. This isn't accidental, and we will not open the floodgates. This is not a program in which 50 institutions can apply no matter who or how distinguished they may be.
>
> COMMITTEE MEMBER. I wanted to know what the origin of the application was.
>
> NIH OFFICIAL. We are fumbling around here. What we do not want to be is flooded under with 15 applications or 50 or something.

All three applications were approved by the ad hoc committee, subject to various conditions, and presented to the National Advisory Health Council on June 8, 1965. By law, every NIH research grant must first be recommended by an appropriate advisory council before the grant can be awarded.

The Council, however, deferred the three applications for later consideration along with such other applications as might be presented to it after the program had been publicized. As one Council member expressed it, "We are sort of in the position of judging a beauty contest with not enough contestants." [39]

The procedure used in bringing the three applications before the Council was criticized by another member who stated:

> I think that when public funds are involved * * * there is a clear obligation on the part of the Federal Government to announce in clear and explicit terms to all interested parties the terms of the competition. * * * And I feel very strongly that this principle ought to be established. And I think that if this is done, that we will find * * * a number of candidates and some of them may be even more lovely than what has gone on before.[40]

The Cornell, Virginia, and Graduate Research Center of the Southwest applications were next considered at a meeting of the

[38] Transcript of meeting, June 2, 1965. Names of participants deleted.
[39] Transcript of meeting, June 8, 1965.
[40] *Ibid.*

Advisory Council on September 28, 1965. At that time the Council recommended approval of the Cornell and Virginia applications, as recommended by the ad hoc committee, and deferred action on the Graduate Research Center of the Southwest proposal, despite the fact that no public announcement of the HSAA program had yet been made. The Council also approved an additional grant application from Michigan State University which had been favorably acted upon by the ad hoc committee a week earlier. The Council was told this was the only potential application that NIH was able to reduce to a concrete proposal since the previous meeting held in June.

Concern was again voiced at the September Advisory Council meeting over the noncompetitive nature of the applications in the absence of a public announcement on the program. But the Council apparently acted on the NIH Director's assurance that the agency had ample precedent in that it had used this noncompetitive approach in the past to initiate a number of other programs. The Council was told that the purpose of this approach was to negotiate with a limited number of schools in order to develop the rules and regulations for the program which would then be extended to a large number of institutions.

Preparation of a public announcement was further delayed, with the result that the HSAA program was not brought before the Council again until it met on March 25, 1966. At that time the NIH staff suggested that the Michigan State application, already approved by the Council, might more properly be funded through a program of the Animal Resources Branch of the Division of Research Facilities and Resources because of its emphasis on a center for animal resources. This was agreed to by the Council, which also voted to pay the grant through the HSAA program the following year if the other funds were not available.

Prior to the March Council meeting, the Graduate Research Center of the Southwest withdrew its application which had been previously deferred by the Council. This action was taken in response to NIH's suggestion that the institution might accomplish a substantial part of the objectives set forth in its HSAA application through the normal research grant mechanisms.

Consequently, only two applications for HSAA awards remained, both having received Council approval in September 1965. NIH decided to divide the $1 million available in 1966 between Cornell and Virginia and requested Council approval at the March 1966 meeting to increase the amounts payable the first year to these institutions accordingly.

The Council agreed to this request, but only after further expression of dissatisfaction with the noncompetitive nature of the applications, and with the principle of making awards to institutions already receiving substantial developmental funds from other sources. These issues are pointed up in the following exchange: [41]

> COUNCIL MEMBER. Secondly, I take it that the general announcement to the university community has only been made very recently. In other words, the opportunity to participate in the program on a competitive basis has only recently been formally announced.

[41] Transcript of meeting, Mar. 25, 1966. Names of participants deleted.

NIH STAFF. Actually it has not yet been announced. It will be announced very shortly.

COUNCIL MEMBER. It strikes me as a very specific illustration of policymaking in a vacuum. It is hardly surprising that the Review Committee found much good in these proposals, but I would argue they would have found much good in proposals from other large, prosperous institutions throughout the country had those institutions had the opportunity to know about the availability of Federal funds.

I am even tired of my own speech on this, I have made it so often.

SECOND COUNCIL MEMBER. We never have got an answer to the question which we have asked several times. How did these three or those two applications happen to come in?

COUNCIL MEMBER. * * * we did get an answer. And it was not a very good one. It was to the effect these had been solicited.

SECOND COUNCIL MEMBER. That was said at the September meeting. I missed the September meeting.

THIRD COUNCIL MEMBER. Excuse me, * * *, what you have said and what * * * said, I think we have all accepted. My concern is the last time when neither of you were here, we went over this again.

I think all of us are recognizing the problem, but let's not fight the Civil War all over again. I think all of us recognize that, shall we say, a majority of the Council members felt that a mistake was made. * * * I think we ought to get on with the discussion of what we have here now. It is in the record that we are dissatisfied.

On the other hand, we now have this announcement made sufficiently ahead of time so that there will be the opportunity for national competition for this coming up.

COUNCIL MEMBER. I am extremely sorry * * * that I did miss the September meeting because it seemed to me that the obvious approach to this problem would have been to suspend review of the program until everyone in this country had an opportunity to participate in it. And I can see no other way that meets the test of equal access to Federal funds.

But put that aside for the moment if you will. There is a new and larger and more difficult issue, and it is made evident in the Cornell application.

Obviously, Cornell is a fine institution. Witness the fact that the Ford Foundation is willing to put a large sum of money into it. The question that confronts us is whether in the light of the large grant from the Ford Foundation this becomes the best expenditure of Federal funds, funds that are extremely restricted. * * *

The committee believes that two main conditions—open competition and the careful formulation of program objectives and policies—should have been met before any HSAA applications were considered.

Whatever the past practices, *the committee strongly recommends that no future grant programs be initiated by NIH or the Public Health Service without fair and open competition*

after the purpose and the policies of the program have been carefully developed and publicly announced.

The committee further recommends that before any new grant program is started, or a major change is made in an existing program, the proposed regulations for the program be published in the Federal Register so that interested parties may have an opportunity to express their views. The final regulations should be approved by the Secretary before issuance.

It is instructive to examine briefly the purposes of the two grants made in 1966.

Cornell University, one of the better endowed private institutions, applied for a 5-year grant to strengthen basic biology as it relates to the health sciences. The university sought help in financing a major developmental program aimed at upgrading the quality of the biological sciences by unifying and improving scattered facilities and attracting additional outstanding scientists to the faculty. The program calls for the establishment of a centralized division of biological sciences organized around biological scientists from the faculties of established departments in the schools of agriculture [42] and arts and sciences.

While the ad hoc committee that reviewed the application recommended approval, and expressed the belief that the proposed program would be a positive step in improving the quality of graduate student training, it did not regard Cornell more deserving of assistance than many other universities. This is apparent from the following discussion: [43]

> COMMITTEE MEMBER. What is your feeling as to what is unique about this program that couldn't be stated for virtually every venerable university in the country * * *?
>
> SECOND COMMITTEE MEMBER. This becomes a difficult one, * * *, because there is no doubt that this kind of shot in the arm would help a good many universities. I would say that * * * we are correcting by this device a bad situation that has gone on for a generation. It probably would get corrected without our support, but on a much slower time scale.

Cornell was awarded $1 million over a 5-year period with $535,000 available for expenditure in the first year beginning June 1966. The first-year budget included more than $372,000 to purchase equipment for graduate training and research, despite the fact that the ad hoc committee was concerned by the size of the equipment request and had expressly recommended a total allowance of $200,000 for this purpose. The original request for personnel support, on the other hand, was greatly reduced in the award, since the Ford Foundation had meanwhile granted Cornell $4.4 million for its biological sciences program with a substantial portion of the grant restricted for faculty salaries.

The University of Virginia, a State institution, was awarded $1,097,650 over a 5-year period, with $465,000 available for expenditure in the first year beginning June 1966. The purpose of the award is to strengthen six basic medical science departments in the university's school of medicine at a time when the university as a whole is

[42] A State-supported college operated by Cornell under contract.
[43] Transcript of meeting, June 3, 1965. Names of participants deleted.

endeavoring to improve the quality of its science activities. The first-year budget of the award is weighted heavily toward equipment and personnel, with lesser sums intended for student stipends and the renovation of facilities.

Prior to receiving the NIH award, the University of Virginia was one of the first 10 institutions aided by the National Science Foundation's recently established university science development program. However, the 3-year $3,780,000 NSF award is intended to attract outstanding scientists to a newly created institute in the Graduate School of Arts and Sciences for research and teaching in six fields of science, including biology. In this respect, the NIH and NSF grants complement rather than duplicate one another by strengthening science in separate parts of the university.

The committee does not question that both Cornell University and the University of Virginia School of Medicine are deserving institutions. The committee has grave reservations, however, about the manner in which NIH initiated the HSAA program and made the first two awards, namely:

(*a*) Without clear statutory authority for this new type of program;

(*b*) Without adequate study of the need of various types of institutions for development funds, and the careful formulation of appropriate program objectives and policies for obtaining the optimum use of limited public funds;

(*c*) Without a prior public announcement of the new program and its eligibility conditions; and

(*d*) Without open competition for the available funds.

The situation is not changed by calling these "experimental" or "pilot" awards. NIH has claimed it was necessary to restrict the first group to invited applicants for the purpose of enabling NIH to develop the rules, regulations, and guidelines for the program. However, this explanation lacks credibility inasmuch as the NIH staff helped the applicants to prepare their applications in relation to each institution's special situation, and it is evident from NIH's general policy and information statement, issued in April 1966, that each proposal must be evaluated as a special case.[44] No eligibility specifications were developed from the experience of the original applications.

The absence of a clear expression of program purpose and eligibility requirements is apparent from the applications filed in response to the April 1966 HSAA policy and information statement. The list of the outstanding institutions that applied for HSAA grants reads like a "who's who" in the educational world; it includes most of the universities having graduate departments in sciences related to health that were classified as "Distinguished" in a recent American Council on Education study.[45]

The committee intends no criticism of the great universities that applied under the HSAA program. On the contrary, many of their proposals involved imaginative approaches for strengthening individual departments as well as the university's total health sciences program. In some instances, the proposal was frankly presented as an

[44] The HSAA document states: "In recognition of the fact that each institution has its own unique and separate set of conditions, interests, and needs, flexibility will be exercised in the evaluation and assessment of its proposed program. For this reason, only general guidelines are provided so as not to restrict institutions from submitting plans most suitable to their requirements." The complete document appears in app. 3.

[45] Allan M. Cartter, *An Assessment of Quality in Graduate Education* (American Council on Education, 1966).

integral part of an expanded program in the life sciences already planned by the institution.

Of the 128 institutions submitting summary proposals, 15 were invited to submit detailed applications. Nine of these 15 finalists had previously received NSF university science development grants.

Five institutions, all recipients of the similar NSF award, were selected for HSAA grants in July 1967.[46] Moreover, one of the original two HSAA recipients had also received this NSF award for the development of "centers of excellence."

Each of the unsuccessful applicants was informed by letter, in November 1966, that it was not selected to submit a complete application. The applicants were told their proposals had been reviewed by a special panel of non-Federal consultants who "evaluated each proposal for overall compliance with the guidelines of the program and for the quality of proposal as to its likelihood of achieving its aims within the framework of the applicant institution's development program."

However, no institution was informed that it was ineligible for the program. Instead, each was advised that NIH expected to issue an announcement in January 1967 for fiscal year 1968 awards, and a new application would be considered at that time.

One illustrious university reacted to the NIH letter with the following communication:

> The rejection of [our] proposal for a Health Sciences Advancement Award, conveyed in your letter of November 19, 1966, was most disappointing.
>
> We can appreciate, of course, that the competition for a limited number of awards was severe, but we would very much like to know, specifically, why our proposal did not meet the competition. We have no wish to add to your workload or ours by preparing another application for next year if, in all candor, there is little or no probability of success. We will very much appreciate, therefore, a full and frank report from you on the reasons for our failure this year.

Now becoming more specific and candid, NIH replied:

> In consideration and discussion of the summary proposal, it was concluded that since * * * is already a generally distinguished university in the Nation, with a high concentration of faculty talent, it would be inappropriate to use the limited Health Sciences Advancement Award funds to further strengthen the departments of anatomy, physiology, and pathology in the medical school, and biological science departments of the school of humanities and science in your institution. It was felt that support from this program would fail in its relative impact in stimulating excellence in biomedical training and research in the Nation, and for that reason the summary proposal was declined for further consideration.
>
> We trust that your goal of strengthening the entire biological community at * * * may be realized, but we cannot support your application at this time.

[46] University of Colorado, University of Oregon, Purdue University, Vanderbilt University, and Washington University.

That NIH itself is unclear as to the purpose of the HSAA program is indicated by the agency's very broad program descriptions which appear to extend eligibility to virtually all universities and professional schools offering graduate programs related to health.

The nature of the HSAA program still remains to be defined:

(1) Is it a program to help the poorer institutions with a desire and potential for self-improvement to make a start toward good graduate training and research?

(2) Is it a program to help some or all of the many good institutions to become "centers of excellence" by enabling them to offer inducements to attract outstanding scientists and gifted students from prestigious institutions?

(3) Is it a program to help the Nation's outstanding institutions—the "centers of excellence"—to become even better?

Any or all of these interpretations of objectives are possible from NIH's statements on the HSAA program, although the evidence strongly suggests that the purpose, like NSF's university science development program, is to provide funds for additional "centers of excellence."

It is the committee's view that a Federal agency should have a clear conception, based on adequate study, of the specific need for, purpose of, and procedures for administering a grant program before initiating it, rather than start a program as a means of studying the problems—as evidently was done in this instance. It is incomprehensible that NIH should be "fumbling around," as one of its officials expressed it, when awarding substantial amounts of public money without first formulating a mature and defensible plan for a new program.

Moreover, the committee believes it was the responsibility of NIH and the Public Health Service to ascertain in advance whether or not there was statutory authority for treating the HSAA program as a component of the general research support program to be funded from the latter's appropriation. The committee has been informed that the HSAA program was initiated without any legal opinion on this basic point having been sought or obtained from the Department's General Counsel. The language of the act authorizing the general research support program is broad. However, it is clear that HEW did not request—and the Congress did not specifically consider authorizing—an institutional grant program having the special characteristics of the Health Sciences Advancement Award.[47]

The committee finds the procedure used in starting the HSAA program irresponsible, unscientific, and contrary to the best interests of the academic community and the Government. Unfortunately, the Advisory Council's recognition that "a mistake was made" provides no protection whatever against NIH's undertaking other programs

[47] HEW's purpose in seeking authority for PHS to make institutional research grants is described in a letter from the Secretary to the Speaker as follows:

"The institutional research grant would constitute the award of a sum of money to an educational or research institution in support of the general research function or program of the institution to assist in the development and maintenance in medical, dental, public health, and other health related areas *without specification of the precise research and research training activities to be undertaken with the grant funds.*" (House of Representatives Rept. 2174 to accompany H.R. 10341 (86th Cong., second sess.), p. 6.) [Emphasis added.]

HSAA grants do not accomplish this purpose, since they are restricted for the specific research and research training objectives set forth in the grant application. In this respect, the HSAA grant is similar to NIH's project and program-project grants—as was pointed up in the handling of one of the three original HSAA applications.

In that case NIH suggested to the Graduate Research Center of the Southwest that it consider recourse to regular research grants as an alternative to the proposal under consideration since, due to the strength of the center's program in the biomedical sciences, it might thereby substantially accomplish its HSAA objectives.

in a similar manner, since the Council's criticism was directed to a particular situation with no binding effect on the agency's future actions, and councils have a continually changing membership. In fact, NIH has admitted initiating other programs in the same way.

It is noteworthy, also, that the Advisory Council was not asked for advice in planning the program; the Council was asked only to approve the individual applications—a statutory requirement for making the grants. It is pertinent in this connection that in approving the legislation which authorized institutional research grants, the House committee specified: "The amount of the grant to each institution would be *determined in accordance with a formula to be developed after consultation with the National Advisory Health Council.*" [48]

Obviously, additional safeguards are needed to help assure that new programs and major changes in existing programs will be administered in a responsible manner.

The committee believes the publication of proposed regulations for these programs in the *Federal Register*, as recommended earlier, will contribute to this end. In addition, ***the committee recommends that before any new program is initiated in the Public Health Service without specific statutory authorization, the program should be formally reviewed by the Department and the Executive Office of the President to determine its conformance with national education and science policies. Also, a written opinion concerning the legality of any such program should be obtained in advance from the HEW General Counsel.***

The committee further recommends that no additional HSAA awards be made unless and until PHS obtains specific legislative authorization for this program.

Inasmuch as the National Science Foundation has a similar program for graduate educational institutions, it is important that the objectives and scope of any PHS program of this kind be specified so as to avoid duplication of NSF's science development activities. The scope and objectives of the NSF programs should also be spelled out to help prevent the duplication of activities in this field.

[48] House of Representatives Rept. 2174, *op. cit.*, p. 3. [Emphasis added.]

VI. SHARING AN INSTITUTION'S TOTAL RESEARCH COSTS—THE SLOAN-KETTERING GRANT

Beginning in January 1966, NIH substituted a single cost-sharing grant for 41 grants and 3 contracts then in effect for the support of specific research and training projects at the Sloan-Kettering Institute for Cancer Research in New York City. The grant, made for an initial 5-year period at annual amounts ranging from $4.3 to $4.7 million, is intended to provide long-term support commencing at a level of almost half (47.3 percent) of the institution's total operating budget. In addition, provision has been made for adjusting the grant to accommodate increased costs of conducting research at the agreed-upon level. Also, hospitalization costs related to the research, as well as any authorized facilities construction, will be financed by separate grants. NIH has claimed these principal advantages for the Sloan-Kettering grant:

(1) NIH will be able to review the grantee's program at one time and as a whole, thereby obtaining a more comprehensive understanding of the program.

(2) It is in keeping with the increasing need to decentralize the making of operating decisions, both scientific and administrative.

(3) It provides greater financial stability for Sloan-Kettering, thereby enhancing the grantee's ability to recruit established investigators.

(4) It provides an incentive for the grantee to use the money where it will be most productive, to redirect grant funds to new activities on short notice, and

(5) The reduction of numerous applications to a single document will lessen the administrative load for both the applicant and NIH.

The committee does not question that this grant is advantageous to the Sloan-Kettering Institute, or that it will relieve NIH of many of its normal administrative responsibilities. The committee is greatly concerned, however, both by the policy implications of this agreement and by NIH's embarking upon an experiment of this magnitude without first developing workable methods for the comprehensive scientific and administrative review of a large institution's total program.

The committee is especially concerned by two consequences of this grant arrangement:

(1) It will remove, over a 5-year period, at least $22.6 million of NIH funds which would otherwise be awarded on a competitive basis, and

(2) Sloan-Kettering's project applications will no longer be subject to the established scientific review process, thereby depriving the grantee of an objective, outside judgment on its individual research proposals.

The committee is aware that Sloan-Kettering Institute is widely recognized as a leading cancer research institution. As such, it undoubtedly merits Government support for its work; this is borne out by the fact that Sloan-Kettering has received NIH grants for many years.

While we do not question Sloan-Kettering's standing as a research institution, the committee is concerned, nevertheless, by the wisdom of providing support for Sloan-Kettering's entire program in the light of the grantee's recent experience in competing for NIH grants.

In the last 2 complete fiscal years which preceded the January 1966 single grant, Sloan-Kettering investigators applied for 34 separate grants, of which only 20 were approved by NIH's scientific review bodies. The approval rate for these applications was 59 percent in the combined fiscal year 1964 and 1965.[49] The comparable approval rate for all NIH applicants in these same years was 58 percent. Six Sloan-Kettering applications were formally disapproved in 1964 and three more in 1965.

Sloan-Kettering fared even less well in competing for NIH grants in the half year which preceded the award of a single cost-sharing grant. During the first half of fiscal year 1966, NIH reviewed 12 project applications, of which five were approved, five disapproved, and two withdrawn.

Moreover, the committee has learned that during 1965 Sloan-Kettering itself supported approximately five research projects for which funds were requested from NIH but denied because the projects lacked scientific merit.

The several study sections which reviewed and recommended the disapproval of recent Sloan-Kettering research proposals gave these explanations in their résumés on five of the applications:

> This unimaginative proposal plans to do studies which have become almost routine in institutions with active hematology and radioisotope services. There is no research support warranted for this plain data-gathering exercise.
>
> * * * * *
>
> Disapproval is recommended. The conceptual approach and experimental plan are remarkably unsophisticated. There is nothing in the application to inspire confidence that continuation of this work would add to the understanding of the mechanism of action of antitumor agents.
>
> * * * * *
>
> There is nothing in this proposal to indicate that the applicants are in a position to contribute significantly to this heavily worked area.
>
> * * * * *
>
> Study section believed that it was logical to precede this study with appropriate pilot studies before initiating the proposed research, which is based on supposition. Concern was expressed also that the applicant was unaware of the

[49] The 20 approved applications include two projects which were not supported because of relatively poor priority ratings, and one project which was withdrawn because the investigator left Sloan-Kettering. Consequently, the 59 percent approval rate is higher than the proportion of cases in which Sloan-Kettering was successful in competing for NIH grants.

immunological procedures requisite to this proposal. Accordingly, a recommendation of disapproval was voted.

* * * * *

Results of this program have been disappointing, and on the basis of the application and information obtained through the site visit, there is no reason to expect that marked progress or significant results will be forthcoming in the future.

If projects are unacceptable to NIH on the basis of an adverse scientific review by its nongovernmental consultants, what justification is there for giving the grantee discretion to finance these same projects from a single cost-sharing grant? If NIH's Study Section-Advisory Council review mechanism is in fact the best available method for bringing scientific judgment to bear on research project applications—as NIH has stated time and again—substituting the grantee's own judgment for that of the established review system in selecting projects for support is surely a questionable practice. We are dealing here not with delegating discretion to the grantee institution for deciding how a limited amount of supplementary research and training money may be spent, as in the general research support program; we are dealing, rather, with the grantee's ability to modify its entire program for which NIH contributes nearly half the total cost.

IMPLICATIONS OF THE SLOAN-KETTERING GRANT

NIH was advised by the Department's Assistant General Counsel that the Sloan-Kettering grant could not legally be awarded either as a "project" or as a "general support" grant—the two types of awards specifically authorized by the Public Health Service Act.[50]

The grant was made, instead, under a longstanding provision of the act authorizing the Surgeon General, upon recommendation of the National Advisory Cancer Council or other appropriate council, to "adopt * * * such additional means as he deems necessary or appropriate to carry out the purposes of this section." [51]

The committee believes the Surgeon General acted unwisely in using the broad discretion permitted by this provision, which was enacted many years ago under very different conditions, to initiate a completely new type of grant without specific statutory authorization. It is noteworthy that under similar circumstances the Department had requested an amendment to the Public Health Service Act in 1960 in order to commence the general research support program.

Although cost sharing of an institution's total operating budget is confined to Sloan-Kettering at present, this establishes a precedent for a type of support which other research institutions would have every right to request. The extension of such support would necessarily have the effect of constricting the availability of grant funds to the detriment of individual investigators and less well known institutions. This is a development which deserves careful study from the standpoint of national policy. It is a step which should not be taken without

[50] 42 U.S.C. 241(d).

[51] 42 U.S.C. 241(i). Reorganization Plan No. 3 of 1966, effective June 25, 1966, transferred the functions vested in the Surgeon General by the Public Health Service Act to the Secretary of Health, Education, and Welfare, who simultaneously authorized their continued performance by the Surgeon General.

full consideration within the executive branch and formal authorization by the Congress.

In view of the manner in which section 301(i) of the Public Health Service Act [52] was used as a last resort to justify the Sloan-Kettering grant, and in view of the size and complexity of the Government's existing health research programs, ***the committee recommends that the Congress amend this provision of the act to clarify and limit the Surgeon General's blanket authority to adopt "such additional means as he deems necessary or appropriate" for the conduct and support of research.***

[52] 42 U.S.C. 241(i).

VII. SHARPENING THE INSTRUMENTS OF SUPPORT

RESEARCH QUALITY

NIH and the Public Health Service have never clearly defined the qualitative level expected of applicants seeking support for their research. It is unclear whether the objective is to support only high quality research or to extend support to all "competent" investigators. The available evidence, however, indicates that the agency is supporting research of less than good quality.

The quality of a project is denoted by its priority rating—the numerical grade assigned by a scientific review panel ("Study Section") when it judges the relative worth of grant applications found acceptable for support.

In 1961 and again in 1962, the committee called attention to the steep decline since 1956 in the quality of research projects approved for NIH support.[53] Table 1 shows this trend continuing, although at a slower rate.[54]

TABLE I.—PERCENT DISTRIBUTION OF APPROVED PUBLIC HEALTH SERVICE RESEARCH GRANT APPLICATIONS BY PRIORITY RATING, 1956-66

Fiscal year	Percent of approvals in priority class			
	100-199 [1]	200-299	300-399	400-500
1956	40	44	15	1
1957	35	44	20	1
1958	32	46	20	2
1959	29	47	22	2
1960	24	48	25	3
1961	24	49	24	3
1962	25	47	25	3
1963	24	49	25	3
1964	24	47	25	4
1965	22	49	26	4
1966	26	47	23	4

[1] Highest rating.

Note: Total percentage for each year may not add to 100 because of rounding.

Source: Division of Research Grants, National Institutes of Health.

The proportion of excellent or superior projects [55] fell sharply from 40 percent of the total in 1956 to 22 percent in 1965, but increased to 26 percent in 1966. At the other end of the spectrum, the annual proportion of marginal or merely passable projects [56] quadrupled from 1 to 4 percent and the projects rated no better than fair rose from 15 percent to about one-fourth of the total during the same period.

Although priority ratings are not precise measures, the trend away from the concentrated support of high-quality research is unmistakable.

[53] 1961 report, p. 28; 1962 report, pp. 25-26.

[54] While the table relates to all PHS research grants, NIH grants (including the Mental Health Institute) constitute about 93 percent of the total. The distribution of priority ratings for NIH-approved applications is approximately the same as for PHS as a whole.

[55] Those in the highest quality class with priority ratings of 100-199.

[56] Those in the lowest quality class with priority ratings of 400-500.

The significance of the upturn in the proportion of highest rated projects in 1966 is not clear at this time. Whether this represents a real reversal in the trend remains to be seen.

The investigator's stature in his field, along with the importance of the proposed research problem and the investigator's approach to it, are the principal factors taken into account in selecting projects for support and in assigning priority ratings.[57]

In general, the highest priority ratings go to the best investigators, and there is a distinct and demonstrable relationship between the way the study sections which evaluate applications describe projects and the priority ratings they assign to them.

The following recurring comments are typical of superior projects assigned to the 100–199 priority class:

Produced excellent results.
Should yield results of considerable interest.
Encouraging results.
Provides information about a fundamental process.
The group is highly competent.
Have made outstanding contributions.
Outstanding investigator.
Excellent program.
Important results.
An experienced investigator of demonstrated competence.
Brilliant record of research.
An outstanding scientist in this field.
Productive.
The research plan is carefully and thoughtfully conceived.

In contrast, these study section comments are typical of the fair to only passable projects rated in the 300–399 and 400–500 priority classes:

The study section lacked enthusiasm about this applicant.
Hasn't pursued the problem aggressively.
The application is not very imaginative.
No novel suggestions are made.
Progress to date has been slow and unimpressive.
Research is steady but without any imagination.
No clearly defined goal.
Justified as a means of keeping an experienced investigator in contact with research.
The work has thus far led to no exciting conclusions nor are any anticipated.
Based on the technical competence of the applicant rather than on the significance of his work.
The use of the reaction does not seem logical.
The mechanism is not clearly defined.
There is little to indicate that the research will contribute anything significant in this area.

Contrary to what the ratings reveal, the claim is frequently made that the quality of research supported by NIH has not fallen as the agency's appropriations have increased.

This was the view, for example, of the Wooldridge Committee which in 1965 said:

[57] 1961 report, p. 35.

> Despite the tenfold increase in NIH support of research during the last 8 years, there is no evidence of overall degradation in quality of the work supported. On the contrary, there is good evidence that the average quality is steadily improving.[58]

Addressing himself specifically to this Wooldridge Committee statement, Dr. Harold Orlans of the Brookings Institution has observed:

> This glowing judgment comports neither with the evidence adduced earlier about the decline in the incidence of high quality NIH grants nor with a careful reading of the carefully worded judgments of many of the committee's own panels * * * the general tenor of these panel judgments does not substantiate the committee's unqualified conclusion of high quality. Most contain reservations the committee disregards; at most two panels (for the behavioral sciences and, perhaps, microbiology) are unequivocal in their praise (and, with some independent basis for judgment, I am quite incredulous about the soaring praise for this behavioral science work). All told, a more accurate summary might be that NIH sponsored research is generally of "good" quality or, as the physiology panel put it, "no better and no worse" than other work in the same field.[59]

The Wooldridge Committee, it should be noted, found that approximately 7 percent of the traditional projects grants examined by its panels were ill-advised.[60] Unfortunately, the committee provided no information on the quality of the newer types of grants it reviewed—such as NIH's large, expensive grants for program-projects, clinical research centers, and primate centers.

It is evident from the PHS's own rating of grant applications that the quality of supported research has been declining, especially the proportion of the top-rated projects. This trend suggests that a much lower level of competence has replaced high quality as the standard for determining whether research is worthy of Federal support.

The committee finds this development discouraging. Moreover, the extension of support to an increasingly larger proportion of poorer quality research raises some fundamental questions concerning the objectives of Federal grants.

What is the merit and the national purpose of supporting research that fails to meet a high qualitative level? If pedestrian research contributes importantly to the advancement of science, that fact has not been brought to our attention. On the contrary, distinguished scientists have warned:

> In the advancement of science the best is vastly more important than the next best. Mediocre research is generally worse than useless, and the same may probably be said of teaching.[61]

It has been stated, further:

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[58] *Biomedical Science and Its Administration, A Study of the National Institutes of Health* (The White House February 1965), p. 3.

[59] *The Use of Social Research in Federal Domestic Programs*, pt. II. A staff study for the Research and Technical Programs Subcommittee, House Committee on Government Operations. Committee print (April 1967), pp. 623–624.

[60] *Op. cit.*, p. 3. Out of 240 research grants investigated, the panels expressed "serious reservations" about nine projects and adjudged an additional seven to be "unworthy of support."

[61] President's Science Advisory Committee, *Scientific Progress, The Universities and the Federal Government* (Washington, Nov. 15, 1960), p. 14.

> In science the excellent is not just better than the ordinary; it is almost all that matters.[62]

SOME EFFECTS OF EXCESSIVE RESEARCH EXPENDITURES

The committee, in 1962, said:

> It is probable that the large annual increases in the NIH appropriation made in the past several years has contributed to the increasing support of lower quality research. * * * The main question raised by this development * * * is whether or not it is sound public policy and in the best interest of science that every project found technically sound and approvable by NIH's outside consultants receive support, regardless of its relative quality.[63]

In the light of the continued lowering of research standards and the excessive diversion of scarce professional personnel from teaching and medical practice to federally supported research, we believe this question must now be answered in the negative.[64]

Perhaps the greatest obstacle to open and objective examination of the undesirable effects of Federal research grants is the fact that PHS now supports most of the biomedical research in the United States. Consequently, investigators are reluctant to "bite the hand that feeds them"—especially in public. There is also a disposition on the part of academic investigators to avoid any criticism which might in any way jeopardize the flow of research money, since these funds also make an important contribution to the teaching programs of most medical schools and many other educational institutions.

It is therefore a rare and refreshing experience to encounter a knowledgeable biomedical scientist candidly discussing this subject. Dr. W. C. Davison, the distinguished dean emeritus of the Duke University School of Medicine, has found, as a consultant on medical education, that "excessive research funds obstruct medical education and service." He states in a provocative article:

> It is true that the National Institutes of Health, the American Heart Association, the American Cancer Society, and other grantors do not insist that the faculty apply for these large grants, but so long as they are available, there is a great temptation to get as much as possible. Few faculty members have the character to withstand this temptation, and to attend to their chief job of medical education. After the lean famine years in the thirties of having too little money for research, it is hard to refrain from gorging like small boys or Indians, and to realize that indigestion from having too much is worse than hunger from having too little. Like the captain in "South Pacific," the members of the staff want more and larger projects, often regardless of whether they are particularly interested in the field in which the grants are available. Some departments are judged by the amount of money they can obtain, even though the members

[62] *Ibid.*, p. 28.
[63] 1962 report, p. 25.
[64] For a discussion of how Federal research programs have diverted scientific manpower from teaching see the committee's 1965 report *Conflicts Between the Federal Research Programs and the Nation's Goals for Higher Education*, H. Rept. 1158 (89th Cong., first sess.), ch. IV.

of the department are already as busy as they can be with teaching and a reasonably active research program. Some appointments and promotions are based on the individual's ability to attract money. In other words, some research is being done primarily to obtain an appropriation and not to further medical education or to stimulate the staff and students. In fact, some outside sponsored projects have been so huge and so hastily and badly planned that the principal investigators, through boredom or fatigue, have refused to write up the results. They have literally been "choked by dollars." With grants for research projects, research facilities, research training, research equipment, research personnel, and for anything in any way, shape, or form, so long as it is for research, the central educational function of medical schools has been seriously distorted. To quote Parkinson's law for "Grantsmanship": "After your grant has been obtained—perhaps from government, perhaps from public charity, or more probably from private benefaction, your next problem is how to overspend the money as quickly as possible so as to be justified in asking for more the next time." [65]

Dr. Davison further observes:

Many American medical schools, including Duke, are being converted into research institutes similar to those of the prewar Germans, but even worse, the research programs with their herds of technicians and junior researchers, instead of being segregated into separate institutes like the Germans, are crowding out the medical students from the teaching space in the laboratories and hospital wards, and creating in the students the image that research is superior to medical teaching and patient care. The curriculum has been so distorted that almost every student is compelled to engage in the research program. Those who have no research skill are given special courses in gadgetry.

* * * * *

* * * it is high time that the dangers of the current research programs in medical schools, as well as their benefits, were recognized. Although medical education cannot be sound without medical research, the latter by having, at present, more available funds than the former is dominating the partnership. A warning is needed for some heads of departments who frankly have allowed their research programs to interfere with their instruction of students and care of patients. It is such a temptation to have a large grant and several technicians and to build a small empire that only the strongminded resist and keep the whole program in balance. Another fear is that the available manpower may be diverted from the medical care of patients, in community as well as in university hospitals, and from the teaching of students and thus, in the long run, cause even a greater shortage of medical teachers.[66]

[65] W. C. Davison, M.D., "Let's Give the Medical Schools Back to the Students," *The Pharos*, October 1963.
[66] *Ibid.*

While the committee has not studied the impact of Federal research grants on medical school programs, there is much food for thought in Dr. Davison's observations. It has long been our position that each school has the primary responsibility for maintaining a proper balance between teaching and research through effective internal management. Effective management requires that an institution control the application for and acceptance of Federal research support so that research does not interfere with its teaching and other responsibilities.

A committee of the National Academy of Sciences has also addressed itself to the harmful effects of Federal grants when universities do not effectively control their research activities. It reported:

> The other trend that may impair the fruitful combination of research and graduate education stems from a lack of strong policy within the universities themselves. Administrations, under pressure to retain distinguished scientists who are tempted by the simplicities of life in nonteaching laboratories in government, research institute, or industry, find that the easiest counter-offer is a promise of reduction in teaching. Some scientists retire from virtually all contact with students, while others only a little less distinguished are so overloaded with teaching that they are forced out of research. Administrations, hoping to add to the prestige of their universities by encouraging large-scale research projects of high visibility, may expect faculty members to buy large amounts of released time from the university. If the administration then allows a professor buying released time to use grant money to run up his salary far above the regular university scale, the stage is set for teaching of all kinds—graduate and undergraduate—to become a "poor relation" to research in the university.[67]

From the Government's standpoint, quality should be the principal criterion for PHS support of research projects which satisfy program requirements. National objectives other than the support of meritorious work, such as strengthening the capability and resources of academic institutions and manpower training, should be accomplished through programs designed specifically for those purposes.

The committee recommends, therefore, that the Surgeon General establish a high standard of quality as the basic qualification for research project support, and that he develop adequate procedures for the uniform maintenance of that high standard by NIH and other bureaus of the Public Health Service. The confinement of research grants to projects in the range of excellent to good should not be breached except in special circumstances where the reasons for supporting a lower quality project are fully documented in a written record.

Support for biomedical research of less than high quality has been rationalized on the grounds that the spillover from this research "enriches the academic environment" and thereby benefits the educational programs of recipient institutions. This trickle-down theory, unfortunately, overlooks the diversionary effects of such support as well as other inefficiencies. If the enlargement of research support is actually intended as indirect assistance to higher education, the re-

[67] Committee on Science and Public Policy, National Academy of Sciences, *Federal Support of Basic Research in Institutions of Higher Learning* (1964), p. 93.

sulting distribution of that assistance may be quite different from the pattern which would otherwise result if educational objectives were openly acknowledged and funds allocated directly for that purpose.

It is important to recognize that lowering the qualitative standards for project support will not necessarily result in a greater share of research money for "have not" educational institutions or change the geographic distribution of grants.

As the committee pointed out in an earlier report, the very limited participation of some universities in NIH's research programs is due less to the quality of their applications than to the disinclination of their faculties to apply for grants. An examination of Advisory Council actions on grant applications showed that, as a group, 10 institutions selected from among NIH's smallest grant recipients had actually succeeded in obtaining a larger proportion of their applications approved than NIH's five largest grantees. However, the very small number of applications submitted by these 10 institutions would appear to indicate that the research interest of their faculty members is not strong.[68]

CONCENTRATION OF GRANTS

Public Health Service research grants are highly concentrated in a relatively small number of institutions. Table 2 shows that 10 institutions received 24 percent of all research funds in 1966 and the top 25 institutions accounted for 43 percent of the total.

TABLE 2.—25 INSTITUTIONS RECEIVING LARGEST AMOUNTS OF PHS RESEARCH AND TRAINING GRANTS, FISCAL YEAR 1966

Institution	Research grants		Training grants	
	Dollars	Rank	Dollars	Rank
Total, United States	$643,859,360		$264,286,261	
California, University of [1]	37,271,554	1	14,797,909	1
Harvard University	17,863,938	2	5,142,469	8
Columbia University	13,160,841	3	5,988,916	4
Johns Hopkins University	12,796,718	4	5,827,318	5
Pennsylvania, University of	12,785,801	5	4,323,166	13
New York, State University of [1]	12,240,855	6	4,268,995	14
New York University	11,733,867	7	4,835,366	10
Michigan, University of	11,712,368	8	7,098,636	2
Wisconsin, University of	11,627,330	9	4,221,625	15
Minnesota, University of	10,506,726	10	6,697,638	3
Total	[2] 151,699,998		[3] 63,202,038	
Washington, University of	10,150,724	11	5,257,623	7
Texas, University of [1]	10,135,958	12	3,452,597	20
Chicago, University of	9,576,839	13	5,049,472	9
Stanford University	9,576,652	14	3,316,552	22
Georgetown University	9,307,421	15	1,585,029	49
Yeshiva University	9,257,261	16	3,451,995	21
Washington University (Missouri)	9,145,252	17	3,802,529	16
Yale University	8,729,637	18	4,393,666	11
Illinois, University of	8,496,543	19	3,788,980	17
Cornell University	8,344,949	20	2,625,902	26
Western Reserve University	7,063,218	21	3,635,618	19
Pittsburgh, University of	6,996,883	22	4,389,204	12
Massachusetts General Hospital	6,842,396	23	1,719,024	47
Baylor University	6,761,179	24	2,280,840	33
Tulane University	6,212,168	25	3,016,447	24
Total	126,597,080		51,765,478	
Total, top 25	[4] 278,297,078		[5] 114,967,516	

[1] Includes grants to more than one major campus.
[2] 23.6 percent of total.
[3] 23.9 percent of total.
[4] 43.2 percent of total.
[5] 43.5 percent of total.

[68] 1961 report, pp. 31–32.

There is also a high correlation between the distribution of research and training grant money. The 10 institutions which received almost one-fourth of all research funds also obtained the same proportion of the training funds. And the 25 institutions getting 43 percent of total research grants simultaneously received 44 percent of the training grant money.

Actually the distribution of training grant money is somewhat more highly concentrated than research funds (table 3). The 10 institutions awarded the largest amounts of training grants accounted for more than one-fourth of the funds, and the 25 largest recipients accounted for over 46 percent of all training grant awards in 1966.

TABLE 3.—25 INSTITUTIONS RECEIVING LARGEST AMOUNTS OF PHS TRAINING GRANTS, FISCAL YEAR 1966

Institution	Dollars	Rank	Institution	Dollars	Rank
Total, United States	$264,286,261		Pennsylvania, University of	4,323,166	13
California, University of [1]	14,797,909	1	New York, State University of [1]	4,268,995	14
Michigan, University of	7,098,636	2	Wisconsin, University of	4,221,625	15
Minnesota, University of	6,697,638	3	Washington University	3,802,529	16
Columbia University	5,988,916	4	Illinois, University of	3,788,980	17
Johns Hopkins University	5,827,318	5	Duke University	3,784,287	18
North Carolina, University of [1]	5,803,854	6	Western Reserve University	3,635,618	19
Washington, University of	5,257,623	7	Texas, University of [1]	3,452,597	20
Harvard University	5,142,469	8	Yeshiva University	3,451,995	21
Chicago, University of	5,049,472	9	Stanford University	3,316,552	22
New York University	4,835,366	10	Boston University	3,243,132	23
			Tulane University	3,016,447	24
			Colorado, University of	2,787,603	25
Total	[2] 66,499,201		Total	55,876,396	
Yale University	4,393,666	11			
Pittsburgh, University of	4,389,204	12	Total, top 25	[3] 122,375,597	

[1] Includes grants to more than 1 major campus.
[2] 25.2 percent of total.
[3] 46.3 percent of total.

DISCRIMINATORY POLICIES

The committee is concerned by the high concentration of research and training funds, and the implication of this concentration for biomedical science education in institutions which receive few or no Federal grants.

If, as the President's Science Advisory Committee has stated, "the process of graduate education depends on 'research' just as much as upon 'teaching'—indeed the two are essentially inseparable," [69] it must follow as a result of the concentration of Federal grants that some universities are unable to provide quality graduate education in their health-related science programs.

The Committee on Government Operations found, in 1961, that many universities as well as some professional schools in the health fields were participating very little in the NIH programs.[70] This situation, in our judgment, deserved serious attention, both for the welfare of these institutions and because of the desirability of a wider distribution of national research resources.

[69] *Scientific Progress, the Universities, and the Federal Government* (The White House, Nov. 15, 1960), p. 5. In developing this point the President's Committee also said: "Of course many necessary parts of a scientist's education have little to do with research, and obviously also for many professors there must be a gap between teaching a standard graduate course and working at one's own problems. Moreover, many good teachers—men who keep up with the new work in their subject and communicate its meaning clearly to their students—are not themselves engaged in research. Yet we insist on the central point; the would-be scientist must learn what it is like to do science, and this, which is research, is the most important thing he can be 'taught.'"

[70] 1961 report, p. 30.

To encourage a broader participation in health research, the committee recommended that NIH initiate a program of special short-term development grants. It was intended that grants of this kind, awarded on the basis of an approved plan for each eligible institution, would serve as "seed" money for stimulating research capability in those institutions having training responsibilities in scientific fields related to health but not actively engaged in research.[71] It was the committee's expectation, at the same time, that high approval standards would be maintained for regular project grants.

The committee's recommendation was not implemented. On the contrary, NIH has tended increasingly since 1961 to favor strong institutions. While some universities which earlier had received very little research support have improved their status as grant recipients, the gap between the "rich" and the "poor" schools appears to have widened in the biomedical sciences.

Several factors are responsible for this development. First, because a relatively limited number of institutions furnish the bulk of PHS's consultants, it is quite likely that these advisers will react more favorably to the institutions and scientists they know best when evaluating project applications.[72] Moreover, study section and advisory council members are in a unique position to learn of research opportunities in their fields and to share with their colleagues an intimate knowledge of how the grant system operates. At the institutional level, the schools already extensively engaged in research are better organized and staffed to engage in "grantsmanship," and the little known applicant from a prestige school may gain a competitive advantage by having an illustrious colleague nominally affiliated with his project and better facilities at his disposal.

Of even greater importance, however, are Federal policies that discriminate against schools which do not already have extensive research programs.

To qualify for a general research support grant, an institution must receive at least $100,000 annually of diversified NIH research project grants. The amount of the general research support grant is then determined by a formula which gives double weight to the institution's research expenditures from non-Federal sources. Hence, the Government's posture is to provide the most assistance to those institutions which already have the greatest access to other research funds. These institutions are thereby further strengthened in competing for project grants by the availability of substantial general research support money for acquiring additional faculty, equipment, central research facilities, and other resources.

An exception to the $100,000 requirement was made in the case of certain health professional schools (medicine, dentistry, osteopathy, and public health). These schools automatically receive a $25,000 base grant each year in addition to amounts payable under the general research support formula. In 1962, 42 of the 153 schools receiving the $25,000 base grant were otherwise ineligible for general research support grants. The ineligible institutions included nearly 70 percent

[71] *Ibid.*, p. 32.

[72] The committee found, in connection with its 1961 NIH study, that almost two-thirds of all study section members came from 34 institutions, and these institutions collectively received 53.6 percent of total NIH research grant funds.

of the dental schools, all schools of osteopathy, one medical school, and one school of public health.[73]

These professional schools may need assistance in developing a research capability, but it is doubtful that the general research support grant is a good instrument for this purpose. For one thing, the general research support grant, intended to help correct imbalances created by federally supported projects, is not restricted to the conduct of research. For another, a health professional school which has not received NIH grants totaling $100,000 is probably more in need of technical assistance for developing a research program (if, indeed, research is valuable for the institution) than of $25,000 for fairly discretionary spending.

As noted earlier, the health sciences advancement award purports to help make good institutions better, and, therefore, is of no benefit to the institution lacking a research capability.

Another new program, the biomedical sciences support grant, is even more discriminatory against weaker institutions than the GRS program of which it is an extension. This grant is intended to provide general research funds to graduate institutions extensively engaged in research supported by NIH grants. However, a graduate school must have received a minimum of $200,000 in NIH research project grants (double the amount required for health professional schools, hospitals and research institutions) to qualify.

A major factor contributing to the widening gap between the "rich" and the "poor" schools is NIH's grant programs for training research workers. Training grants, with their extensive support for faculty salaries, student stipends, and scientific equipment, generally flow to where institutional strength is greatest. A school, or department, must be academically strong as a prerequisite for obtaining training support. It was shown earlier that a relatively small group of institutions receive a very large share of all training and research grants awarded by the Public Health Service.

The concentration of Federal research and training funds in a limited number of institutions has predictable consequences: The favored schools are thereby assisted in competing for outstanding faculty members and students; these faculty members, recruited with help of Federal funds, are able to bring additional project grants to their new institutions; and the enhanced quality of the institution virtually assures the receipt of more PHS training grants which constitute an important and flexible contribution to its educational programs.

AIDING WEAKER INSTITUTIONS

It is important, in the committee's judgement, for the President and the Congress to identify more precisely the respective responsibilities of Federal agencies that deal with educational institutions in the biomedical sciences.

The committee believes it appropriate for all Federal agencies requiring the research assistance of educational institutions in the performance of their missions to support needed and meritorious projects. However, the responsibility for Federal programs intended

[73] National Academy of Sciences—National Research Council, *The General Research Support Program of the National Institutes of Health*. A report of a study by a committee of the Division of Medical Sciences (Mar. 31, 1965), p. 16.

specifically to strengthen institutions of higher education should not be diffused among agencies. It is neither economical nor efficient for every agency sponsoring outside research to administer a program for strengthening recipient institutions. Educational objectives are poorly served if Federal agencies authorized to sponsor research relevant to their missions undertake general research support or institutional improvement programs in order to establish areas of influence in the academic world.

With respect to the Public Health Service, ***the committee recommends that its responsibility for programs designed to develop or improve the capability and resources of educational institutions be limited to medical and other health professional schools.*** The general research support program is not included in this category since the Congress authorized these grants, permitting broad discretionary spending, specifically to supplement project grants. ***The committee recommends that the responsibility for grants intended to strengthen educational institutions other than health professional schools be confined to the National Science Foundation and/or the Office of Education—the two Federal agencies broadly responsible for strengthening basic science and education.***

To provide for more equitable treatment of the smaller and less wealthy institutions, ***the committee recommends the following changes in PHS policies:***

(1) Qualification for a GRS grant should be based on a school's receiving $100,000 or more annually in research project grants from all units of the Public Health Service combined, rather than exclusively from NIH. Moreover, HEW should consider broadening the GRS program, with appropriate legislative authority, to include health-related research grants made by other units of the Department in such programs as vocational rehabilitation and maternal and child health. Eventually, a single general research support grant for each eligible institution, administered on a Government-wide basis, would be most efficient and desirable.

(2) The amount of each GRS grant should be determined solely on the basis of the institution's research expenditures from Federal sources. The committee does not believe the premium given for non-Federal research funds under the existing formula operates as a meaningful incentive for attracting private funds. Rather, this premium discriminates against poorer institutions, favors research organizations over institutions of higher education, and, as demonstrated in chapter IV, has been difficult to administer and wasteful of Federal research money.

(3) The same GRS eligibility requirements should be applied to health professional schools as to other institutions. To the extent that health professional schools require assistance in developing a research capability, this should be accomplished by a separate program of technical and financial assistance tailored for the purpose.

(4) The separate biomedical sciences support grant should be discontinued, and the GRS grant awarded to

graduate schools on the same terms as to professional schools, hospitals, and research institutions.

(5) Until such time as a single general research support program may be established on a Government-wide basis, the NIH program and NSF's institutional grants program should be closely coordinated to avoid duplication. Some institutions presently receive general research support from both NIH and NSF computed on the basis of the same research projects; this occurs because NSF bases the amount of its award exclusively on the research (as well as some research training) grants it makes, while NIH includes these same NSF research grants in the computation for GRS awards.

We believe the implementation of these recommendations will benefit the Nation's weaker academic institutions and will result in a better geographic distribution of Federal research funds.

The committee recommends, further, that the Secretary of HEW review the numerous NIH and other PHS training grant programs to determine if they are effectively organized to serve national manpower needs and objectives. This review should be concerned particularly with ascertaining if the institutions which receive large amounts of training funds are making a proportionate contribution to the Nation's manpower supply. Conversely, the Secretary should determine if training grant policies discriminate against schools which award graduate degrees in the biomedical sciences but receive little or no PHS training support.

INSTITUTIONAL DEVELOPMENT GRANTS

There is a need today, as there was in 1961 when the committee first discussed this matter,[74] to encourage the development of research capability in many institutions teaching sciences related to health. Special programs are needed to strengthen those institutions which award graduate or professional degrees in the biomedical sciences but do not participate significantly in federally supported research.

Such programs, however, should be undertaken only after careful study of institutional needs and program objectives, and should be coordinated in the Executive Office of the President to prevent overlapping and duplication if the administrative responsibility is assigned to more than one Federal agency.

The committee recognizes the importance of increasing the number of first-rate universities to accommodate our Nation's growing requirements for highly trained manpower. It is desirable, moreover, to have strong institutions in all sections of the country, both for the convenience of students and the economic and cultural benefits such institutions impart to their areas.

But it is equally important that weak institutions be improved. In the committee's judgment, it is inadvisable for Federal agencies to award "development" or "advancement" grants to help already good schools achieve "excellence" in absolute preference to aiding the Nation's weaker institutions.

[74] 1961 report, p. 32.

This, however, is the policy that has been followed by NIH in the health sciences advancement award and by NSF in the university science development program, although NSF has recently initiated two companion programs for lesser institutions. Moreover, universities are eligible to receive grants simultaneously under the similar NIH and NSF programs.

Confining development grants to those schools submitting the most sophisticated proposals, or to those most capable of achieving excellence, is tantamount to freezing out the most needy institutions whose resources are too limited for self-improvement. Furthermore, the effect of such a policy is to direct the flow of outstanding scientists to already well-developed institutions and away from the universities most in need of qualified faculty to help them catch up with modern science.

Although most of the institutions that rank among PHS's largest recipients of research and training grants also produce relatively large numbers of Ph. D.'s in the health-related sciences, some schools receive very little PHS support and yet award a significant number of such degrees.

To illustrate this point, the latest available data show that institutions such as the University of Delaware, the University of North Dakota, Mississippi State University, and the University of Wyoming receive comparatively small amounts of PHS grants for research and graduate training, even though these schools produce as many Ph. D.'s in the basic medical and other bioscience fields as some institutions which rank among the 35 largest recipients of PHS support.[75]

Of these universities, Delaware received the most PHS research money in 1966 ($220,013), and Wyoming the least ($54,292). Delaware's total included a $29,440 biomedical sciences support grant, which the university will not receive in 1967 because its research project grants from NIH totaled less than $200,000 in 1966. Delaware received no PHS grants for graduate training in 1966; Wyoming was awarded $23,500 for graduate training in nursing.

It is true, of course, that grant money is used also for the post graduate training of M.D.'s and Ph. D's. Much of it, moreover, is expended by scientists working exclusively on research projects with no involvement in the educational programs of their institutions. Nevertheless, the fact remains that graduate institutions which receive little or no PHS training and research money are at a disadvantage in obtaining an outstanding faculty, modern scientific equipment, and gifted students.

It is estimated that in 1964–65 the National Institutes of Health provided stipend support to one-fifth of all predoctoral students in the biosciences—42 percent in the basic medical sciences and 7 percent in the other biosciences.[76] Since most stipends were paid from training grants, it is evident that students enrolled in schools which did not receive significant amounts of these funds did not have an equal opportunity to obtain Federal financial aid.

[75] See appendixes 4 and 5 for the number of doctor's degrees, by institution and field, conferred in 1964–65 in the basic medical and other biosciences. First professional degrees, such as the M.D., are not included in these tables.

[76] U.S. Department of Health, Education, and Welfare, Public Health Service, National Center for Health Statistics, *Health Resources Statistics, Health Manpower*, 1965, pp. 24–25.

If it is true, as leading scientists have held, that an active research program is essential to graduate training in the sciences, it should be a matter of public concern that many universities throughout the Nation are conferring graduate degrees in the biomedical sciences without their faculties participating actively in Government-supported research.

The committee has already commented on the desirability of helping weaker institutions to upgrade themselves. We believe it is as important for these institutions to learn how to achieve quality in their science education and research programs as to obtain the necessary funds for improvement.

The committee recommends, therefore, that the President designate one or more Federal agencies to provide technical assistance, upon request, to help institutions plan for the improvement of their science education and research programs. It would be logical for the Public Health Service to be concerned with the health professional schools; other groups of institutions in which the biomedical sciences are taught might be made the responsibility of the National Science Foundation and/or the Office of Education.

Dr. James B. Conant has called attention to the need for a study, on a nationwide basis, of the standards for the Ph. D. in the 219 institutions awarding this degree. "One suspects," he says, "the standards in some of these are low." Dr. Conant believes such an inquiry is timely because of the vast sums of money being spent on research and in training research people.[77]

The committee strongly endorses Dr. Conant's views on the need for a study of doctoral degree standards. It is essential that information of this kind be systematically obtained through a nationwide study if institutional development programs are to be intelligently constructed and applied where they are most needed. As discussed earlier, the NIH Health Sciences Advancement Award is a prime example of a program started with no real study of the problem and without a clear concept or statement of program purpose.

Dr. Conant suggested the proposed study might appropriately be made by the recently established Education Commission of the States. The committee hopes the Commission will undertake this study in the near future. As an alternative, the committee believes it could most usefully be done under the auspices of a respected private foundation or educational association which would have the cooperation and trust of the institutions to be studied.

A variety of Federal programs presently exist for the improvement or expansion of educational facilities in health professional and graduate schools. These include grants under the Health Professions Educational Assistance Act[78] (to aid in the construction of teaching facilities in medicine, dentistry, osteopathy, pharmacy, optometry, podiatry, veterinary medicine, and public health) and grants under title II of the Higher Education Facilities Act of 1963, as amended,[79] to help universities establish or improve graduate schools and cooperative centers.

[77] *Congressional Record*, Aug. 2, 1965, p. 18280.
[78] Public Law 89-290.
[79] Public Law 89-329.

Besides construction grants, the PHS provides grants under the Health Professions Educational Assistance Act [80] to help improve the quality of educational programs in schools of medicine, dentistry, osteopathy, optometry, and podiatry. These "basic improvement grants," which may be used to pay salaries, purchase equipment and supplies, and for minor alterations or renovations, are designed to encourage increased enrollments as well as quality improvements. The amount of each grant is determined by a formula based on the number of full-time students. In addition, the Surgeon General may award special improvement grants to help a school maintain its accreditation or to provide for special functions.

Very few Federal programs, however, are concerned with improving the educational quality—and, consequently, the research capacity—of universities which offer graduate level instruction in the biomedical sciences. Those which are concerned with institutional improvement direct their assistance primarily to strong institutions desirous of becoming outstanding.

A grant program aimed somewhat lower—the departmental science development program—was recently launched by the National Science Foundation. Its purpose is to strengthen individual areas of science and engineering at graduate institutions "not yet ready to move into the top rank on a broad front but which have significant strength and potential for marked improvement in at least a single field or area of science." [81]

A complementary grant program for undergraduate institutions—the college science improvement program—was inaugurated by NSF at the same time. Although this program is intended to aid 4-year colleges and schools which offer graduate training in science only to the master's level, those universities which granted fewer than 10 Ph. D.'s in the sciences during a 3-year period are eligible.[82]

Also at the undergraduate level, the Commissioner of Education is authorized by title III of the Higher Education Act of 1965 to make grants to help raise the academic quality of "developing" colleges—those "which have the desire and potential to make a substantial contribution to the higher education resources of our Nation but which for financial and other reasons are struggling for survival and are isolated from the main currents of academic life." [83]

The committee believes similar attention should be given to improving the academic quality generally of weak graduate institutions. In view of the national need for well-trained scientists, the Federal Government cannot be indifferent to the condition of our weaker universities. It is the committee's expectation that the study of doctoral degree standards proposed by Dr. Conant would provide important information on where institutional needs are greatest.

Dr. Philip H. Abelson, the editor of *Science* magazine, has written pointedly in this connection:

> * * * the have-not States form a discontented majority. There is a painful contrast between the resources of their universities and those of the schools at the top of the list, and the current grants system serves to increase the disparity. The have-not institutions are especially deficient in modern

[80] Public Law 89-290.
[81] Notice to presidents of universities and colleges from NSF Director, Oct. 28, 1966.
[82] *Ibid.*
[83] Public Law 89-329.

instrumentation and accordingly can neither compete successfully in research nor educate properly. A new Federal-aid program responsive to political realities and educational needs is required. It should provide substantial sums, on a per capita basis, for attendance at science courses that meet minimal standards.[84]

The committee recommends that the President give early attention to the problem of improving the academic quality of weaker graduate institutions and that a unified and coordinated Federal assistance program be developed for dealing with this matter. The committee believes the present piecemeal and uncoordinated approaches of Federal agencies to institutional improvement are competitive, wasteful, and frequently not directed to the heart of the problem.

It is likely that the improvement of weak institutions will require an individually tailored plan for each institution involving technical help as well as financial assistance. Also, consideration should be given to allocating training grants to institutions which meet satisfactory standards in proportion to the number of students enrolled and graduate degrees conferred in the sciences.

While programs for strengthening graduate institutions might be initiated first for the sciences, the committee believes the liberal arts should ultimately be included so that our universities can develop as balanced institutions. The committee's emphasis here on graduate institutions, occasioned by the fact that these together with the medical schools produce most of the biomedical scientists and perform most of the Nation's biomedical research, should not obscure the national importance of also strengthening our colleges whose student output makes graduate education possible.

[84] *Science*, Aug. 19, 1966, p. 819.

VIII. SOME SPECIAL MANAGEMENT PROBLEMS

INEFFECTIVE CENTRAL MANAGEMENT

The Public Health Service has consistently failed to obtain compliance with many of its grant policies.

For example, PHS requires the grantee to file a separate report of expenditures for each research project within 120 days after the end of the annual budget period. Although some grantees have repeatedly ignored PHS's requirement of timely expenditures reports (which provide essential information for determining the amounts necessary to fund the continuation years of long term projects), the agency has taken no corrective action in these instances. As of February 1967, one grantee (Health Research, Inc.) had not filed expenditure reports on 39 of 81 grants awarded in fiscal year 1964 and 67 of 71 grants awarded in 1965. In informing the committee that PHS had requested expenditure reports from this grantee every 3 months, the Surgeon General said:

> These efforts have not resulted in the receipt of delinquent expenditure reports and, accordingly, we must consider the Health Research, Inc., expenditure reports for fiscal years 1964 and 1965 not yet received to be unjustifiably delinquent.[85]

As was shown earlier, between 1962 and 1965 NIH and other units of the PHS made excessive indirect cost payments to many grantees in violation of established PHS policy.

The PHS has also permitted unjustifiable variations among its bureaus, divisions and institutes in the interpretation and application of agency policies. There is a large degree of independent action by PHS units in situations where the uniform implementation of policies is both intended and desirable. Some differences are to be expected in a large organization, but others are purely arbitrary and result from inadequate central direction and supervision.

Although an elaborate procedure exists for the development and promulgation of grant policies, there is essentially no followup to assure the Surgeon General and his immediate staff that:

(1) policies are being properly interpreted, and
(2) policies are being implemented as uniformly as practicable.

This situation persists despite the recent reorganization of the Public Health Service which established a Division of Grants and Contracts in the Office of the Surgeon General. The functions of this Division include the followup responsibilities described above, but its staffing has been so meager as to preclude any significant accomplishment in this area.

The structure of the Public Health Service, and especially NIH, is so decentralized and its staff so administratively independent that often one component does not know how another is implementing the same policies.

[85] Letter of Feb. 20, 1967, from Surgeon General Stewart to Subcommittee Chairman L. H. Fountain.

There is no single grants management office in the PHS—or within NIH—to provide uniform interpretations of policies and procedures and to receive complaints from grantees as well as agency personnel.

The effect on grantee institutions of inconsistent policy interpretations and administrative practices among PHS units is obvious. Variations in the application of policy by different offices of the same agency can only lead to confusion, administrative difficulties, and distrust on the part of grantee institutions. The existence of such variations also offers a strong temptation to investigators and institutional business officers to "shop around" for the most favorable interpretations of PHS policies.

The lack of effective central management in NIH was criticized by an outside management consulting firm retained to study the Cancer Institute's organization and procedures. It reported:

> * * * organizational and procedural recommendations are important. However, no organizational arrangements or procedures will work effectively if they are not based on sound, clearly defined concepts or if management direction is inadequate. Therefore, even more critical than the specific details of organization structure and procedures is the effectiveness of management leadership and direction given the programs from both the NIH and the Institute levels.
>
> The activities of the grants and training area, though designed to support scientific endeavor, are in themselves essentially of a production type. They involve considerable high volume, repetitive, paper-processing operations. Their purpose is to facilitate the making and conveying of decisions that affect scientific endeavor. They are also expected to reflect in a consistent manner the policies and objectives of the National Institutes of Health and the Cancer Institute. If the underlying decisions, policies, and objectives are clearly spelled out, then the bulk of the grants and training area activities can be designed for relatively routine treatment. They then can and should be carried out at minimum cost, despite rapid growth, cyclical workloads, and tight deadlines.
>
> * * * * *
>
> A highly permissive approach reflecting a philosophy of scientific freedom seems to have been carried over to the processing activities. From the NIH level, this approach has permitted, and in some instances encouraged, the institutes to go their separate ways. In NCI, it has been extended to the operations of branches, sections, and individuals. As a result, clerks and scientific administrators have developed a number of procedures based on personal inclinations rather than on well-defined, overall objectives and common goals, with the result that similar work is not done consistently or uniformly by all performing it. In fact, one official summed it up this way:
>
> "We have extended academic freedom to the bookkeeping department with results too horrible to contemplate."
>
> This somewhat overstates the situation; nevertheless, it is indicative of tendencies observed. We submit, therefore, that until there is full acceptance of the need for firm direc-

> tion and control in the management of the production-type activity represented by the grants and training area, relatively little progress will be obtained in improving organization and procedures.[86]

This committee and others have, over the years, attributed NIH's management difficulties largely to a highly permissive attitude that allows the Institutes to go their separate ways. Nevertheless, this situation has continued basically unchanged to the present. The low esteem of administrative management in NIH was epitomized 5 years ago by the Director's statement that after research projects are selected for support all subsequent administrative actions are "essentially trivial." [87]

In this regard, we wish to restate and reaffirm the committee's position of 5 years ago, when we said:

> The committee agrees that the selection of good investigators and good projects is vital to productive scientific research, but the effective management of grants is also a fundamental responsibility of a Government agency charged with administering grant programs.
>
> The committee takes strong exception to the view expressed by NIH that all administrative actions subsequent to the selection of grant projects are "essentially trivial" in relation to the basic selection process. The selection process and grant management are essential and complementary parts of NIH research support. Excellence is required of both.[88]

The committee is convinced that NIH's administrative shortcomings will not be corrected unless and until (1) the NIH Director takes a strong interest in this objective and staffs his agency with skilled management personnel who are given adequate authority and accepted on an equal footing with personnel concerned with the scientific aspects of grant programs, and (2) the Surgeon General establishes adequate machinery for the uniform interpretation and implementation of PHS policies.

Biomedical scientists should not be excluded from serving in a managerial capacity when they possess the requisite qualifications. However, the practice of assigning scientists without management skills to such positions as a substitute for employing highly qualified administrators should be discontinued.

The attitude of public officials toward their management responsibilities is an important determinant of how well grant programs are administered. Some NIH officials, as well as some grantees, tend to see an incompatibility between the vigorous enforcement of grant policies and academic freedom. This, in our judgment, is a misleading view. The object of strong management is to assure that grant funds are distributed equitably, and are used prudently and for their intended purposes. The committee sees no incompatibility between this objective and the principle of allowing scientific investigators the greatest possible freedom of action to carry out their research. As we stated in an earlier report:

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[86] McKinsey & Co., Inc., *Improving Organization and Procedures, Grants and Training Area, National Cancer Institute* (December 1961), pp. IV, 1–5.
[87] 1962 report, p. 14.
[88] *Ibid.*, p. 25.

> * * * freedom for the scientist should not be confused with license or fiscal irresponsibility. One cannot condone waste and extravagance wherever it exists as being either in the public interest or in the interest of science. Grant money that is uneconomically or inefficiently spent deprives other scientists of support for their work. Moreover, the injudicious use of research funds is grossly unfair to the American public which is required to support this activity through taxation. What we must achieve is a harmonizing of freedom for the investigator with responsibility to the public in the expenditure of Government funds. NIH has the obligation to develop adequate policies and procedures for assuring that grant funds are prudently spent within this context.[89]

To provide for the more effective management of grant programs, ***the committee recommends that the Surgeon General (1) establish in PHS, and in each of the bureaus which administer grant programs, a single grants management office to provide uniform interpretations of policies and procedures, and (2) provide adequate staffing for PHS's Division of Grants and Contracts to enable this unit, on a current basis, to maintain surveillance over and liaison with the several bureau grants management offices to assure that policies are being properly and uniformly implemented.***

ADVISORY COMMITTEES

The committee noted in a previous report that the relatively small number of institutions which receive the bulk of NIH's grant funds also furnish a majority of the consultants who serve on study sections. At that time, almost two-thirds of all study section members came from 34 institutions receiving at least $1 million each in grants, and these institutions collectively received 54 percent of the total grant money. The committee was concerned that this concentration of consultants, together with the normal tendency of advisers to favor the institutions and scientists they know best, might result in unduly restricting the distribution of Federal research support.[90]

A similar view was expressed in 1964 by a committee of the National Academy of Sciences, which warned:

> When some individuals serve too continuously on the panels of one or several agencies, and when a few universities are regularly overrepresented, the burden is too concentrated on the individuals involved and the system is open to the charge of favoritism in judgment.[91]

The Academy Committee further stated that:

> The burdens on individual advisers must be kept to a minimum, by using more advisers and rotating them often. The pool of competent scientists from which panels can be drawn is not only large but expanding.

[89] 1962 report, p. 21.
[90] 1961 Report, pp. 28–30.
[91] Committee on Science and Public Policy, National Academy of Sciences, *op. cit.*, p. 83.

> Every effort should be made to give younger scientists their turns on panels, both to spread the work and to infuse new points of view.[92]

We are especially concerned by the tendency in PHS to appoint a small group of individuals to multiple terms on advisory councils and other major advisory bodies. The committee has been informed that since 1946, 123 individuals have served two or more terms on these advisory bodies; four persons have served five or more terms. The record is held by a consultant who has served on advisory councils continuously since 1948—a period of 19 years—and who will have completed 22 years when her present term expires.

In several cases brought to the committee's attention, Council members or their close associates appear to have received preferential treatment in the consideration of grant applications. In one of these instances, the grant applicant was accorded the unusual privilege of appearing personally at the Council meeting to plead his case; the Council then approved the grant as requested, rather than the much lower amount recommended by the study section. In other instances, grant applications disapproved by study sections have received Council approval and have been paid in the entire amounts requested. Instances such as these suggest that considerations other than scientific merit and program objectives at times enter into the awarding of research grants.

Moreover, when some of the same individuals who have served on advisory councils for many years receive substantial NIH grants, and also testify before the Congress in support of the agency's appropriations, the appearance of favoritism is unavoidable.

We subscribe to the view expressed by the National Academy of Sciences that the Nation's manpower resources for advisory purposes are large, that more advisers should be used and rotated more often, and that younger scientists should be afforded an opportunity to serve on PHS panels.

The committee recommends, therefore, that appointments to advisory councils be limited to one 4-year term, with members ineligible for reappointment, or appointment to other advisory councils, for a period of four years following the completion of their terms.

Continuity of advisory councils would be obtained, as at present, by staggered terms.

The committee recommends, further, that consideration be given in the selection of advisory committees to obtaining a balanced representation of geographic regions and educational institutions. To the extent possible, consultants should be drawn from among qualified scientists who are not themselves recipients of PHS grants.

INSTITUTIONAL ACCOUNTABILITY

Without an effective system of accountability within grantee institutions for equipment and other major expenditure items, there is little reason to expect economy and efficiency in the expenditure of Federal funds.

[92] *Ibid.*

Traditionally, Federal grants have required that recipients contribute a major share of program costs, usually in accordance with a fixed matching formula. This sharing of costs, together with program specifications and accountability requirements, has normally provided the stimulus for grantees to expend Federal money as carefully as their own.

Project grants, however, are quite different. Here the Federal share is usually a very large proportion of total costs, often approaches 100 percent, and the grant is earmarked for the research of a particular investigator or research group. Consequently, it is not easy for institutional management to control the spending habits of investigators who lack self-restraint, and there is no built-in incentive for the institution itself to economize since unspent research money cannot be used for other purposes. Only with the installation of formal management systems, utilizing modern accounting and auditing, central purchasing, inventory management, and other basic business techniques, and applicable to all institutional expenditures regardless of source, can a sizable grantee institution be equipped to provide meaningful stewardship of Federal grants when spending decisions are made locally.

In this connection, the Wooldridge Committee's Administration Panel—

> noted with concern that effective systems for central purchasing and inventory control seem not to be universally present in the grantee institutions. Each of them, we think, should be expected by NIH to furnish assurance, through a simple inventory system, that any proposed purchase of a major piece of equipment is in response to a need the institution cannot fill except by a new acquisition. NIH should also expect any grantee institution to furnish assurance, through a sufficiently strong central purchasing operation, that its buying is done in an orderly, well-regulated, easily auditable manner.[93]

It was the Panel's view that "certain minimal standards of competence might properly be established by NIH as prerequisites for any institution proposing to become or remain a legal grantee."[94]

While NIH recognized, as a consequence of the subcommittee's 1962 hearings, that it had not "taken adequate steps to make certain that grantee institutions are both capable of and in fact are effectively discharging their responsibilities,"[95] relatively little has been accomplished along these lines in the past 5 years.

One noteworthy effort was NIH's initiation in 1963 of a study in seven institutions of the feasibility of enlarging the grantee institution's role in the management of research projects. The subcommittee was informed late last year that this pilot study has been completed and that NIH, on the basis of it, is planning to expand the number of institutions which will be given more responsibility with corresponding greater authority, in grant administration.

The committee favors the principle of enlarging the management role of grantee institutions, provided that (*a*) individual institutions are equipped to effectively discharge the added responsibility and (*b*)

[93] *Op. cit.*, pp. 119–120.
[94] *Ibid*, p. 101.
[95] See footnote 7.

the decisions involved can properly and effectively be made by grantees. It is not evident from the NIH study that each of the participating institutions possessed satisfactory policies, procedures and systems to administer grants in accordance with existing PHS policies.

To illustrate this point, the Defense Contract Audit Agency recently completed an audit for HEW of all research and training grants made by HEW agencies during the fiscal years 1965 and 1966 to one of PHS's largest grantees—a university which was one of the seven participants in NIH's aforementioned study. The audit report disclosed the following major deficiencies:

(1) Labor costs were charged to grants at the predetermined budgeted amounts estimated by the university at the time the grant was made. The budgeted amounts were not subsequently adjusted to reflect amounts properly supported by time and effort reports, and reports of expenditures also reflected the unadjusted budgeted amounts for salary and wage costs.

(2) The basic source documents (time and effort reports) required to substantiate salary and wage charges to grants were unreliable. For example, at the school of medicine, where the preponderance of grant costs are incurred, the auditors found that the time reports were merely attendance records which did not identify work performance or the grant on which work was performed. It is impossible to determine the amount of labor costs properly allocable to HEW grants from these reports. In addition, time and effort reports were not prepared on a timely basis in accordance with HEW requirements.

(3) No formal records exist to account for vacations actually taken by professional personnel. The university follows the practice of charging vacation salary payments to the grant on which an employee is budgeted immediately prior to his vacation; no attempt is made to determine the vacation pay properly chargeable to a grant or to more than one grant.

The audit report demonstrates the possible consequences of this practice with the following case: An employee who had worked on a HEW grant for 22 days at 50-percent effort was terminated. The proper vacation charge to the grant should have been 11 hours. The grant, however, was actually charged for 16 days of this employee's vacation pay.

(4) There is no universitywide written policy relative to sick leave payments. In general, the university has only a limited number of written policies and procedures for the guidance of personnel involved in the administration of HEW grants.

(5) Procurement policies, systems, and procedures followed by the grantee are inadequate and inefficient for the annual purchase of over $2 million of material and supplies for use on HEW grants. The absence of a formal procurement system has resulted in purchasing practices which cannot be considered sound and prudent business management for the expenditure of public funds.

(6) The grantee does not have procedures to determine that all material and supplies charged to a grant have actually been consumed during the period of the grant.

This audit reveals a surprising laxity in the management of public funds by a large institution receiving very large amounts of PHS

research and training grants. The committee does not know how typical these practices may be of other large grantees. It is reasonable, nevertheless, to expect even less effective management of grants in many smaller institutions.

Grants to this same institution were audited for NIH in 1963 by a certified public accounting firm. The CPA firm reported:

> At * * * University primary control over the propriety of expenditures made from grant funds is the responsibility of the principal investigator. This control is exercised by the principal investigator in initiating or approving expenditures of grant funds and in reviewing monthly expenditure reports prepared by the university treasurer's office.
>
> The bursars or business office of the individual schools are chiefly concerned with ascertaining that the grant budget prepared by the principal investigator is consistent with the budget approved by NIH.
>
> The University treasurer's office, insofar as grants are concerned, is essentially limited to performing the functions of disbursing and recording expenditures. There is no internal audit group at the university.[96]

HEW has informed the committee that these same conditions prevail today: (1) the control of grant funds is still vested in the individual investigator, with no university office having the authority to review and overrule his decisions, and (2) the university has not yet established an internal audit group. The committee was informed, moreover, that the situation is similar in a number of other large institutions.

It is mystifying that NIH would select an institution lacking in such essential elements of financial management to participate in a pilot study which transferred to the grantee institution the authority for making many expenditure decisions normally subject to NIH approval. It is even more surprising that NIH has decided, as a result of the pilot project, to delegate increased authority for expenditure decisions to additional institutions.

Professor and Mrs. Somers, of Princeton University, have analyzed the problem of improving management in grantee institutions, and NIH's experimental project for delegating administrative authority to seven institutions, in the following way:

> But the success of this project and the eventual delegation of greater administrative discretion to all grantee institutions depends primarily on the ability of these institutions to develop and to demonstrate efficient research management. Money is not the principal problem. Medical schools, despite their financial difficulties, are not poverty striken. They do not operate on subsistence budgets. Their faculty salaries are higher than those in other branches of American education. Lack of administrative facilities and leadership is not primarily a matter of money but of academic tradition and, especially, the traditions of academic medicine, including the extreme individualism of the medical profession and the autonomy of faculty members, many of whom are unpaid or employed part time.

[96] Touche, Ross, Bailey, and Smart, *National Institutes of Health; Examination of Selected Grants to . . . University* (Jan. 10, 1964), p. 4.

> Many institutions have no special administrative machinery for handling research grants and contracts. Where the machinery exists, it may be little more than a clerical office for processing grant applications and writing checks. Research committees, while probably more common, may operate in the most perfunctory manner or even on a log-rolling basis. The idea of a research director or dean saying No to a project grant that seems likely to have NIH approval or of calling an investigator on the mat for inadequate attention to a research commitment or for improper travel on Federal funds is highly repugnant to all concerned. Questions of academic freedom would almost certainly be raised.
>
> At this point we wish only to emphasize the necessity for more sophisticated and higher level research administration if the creative new partnership between the Federal Government and the medical schools is not to slide into a general nationalization of science and medical education.[97]

The observation that institutional research committees may operate in a perfunctory manner in reviewing project applications was underscored by the special committee that conducted NIH's pilot study in seven institutions. The committee reported:

> It is also interesting to note that one of the CPA firms which carried out a systems audit of one of the larger PHS grantees made the comment that review of applications by grantee officials tended to be cursory and uncritical, with the view that the PHS staff and consultant review would discern both the fiscal and scientific inadequacies; at the same time review in the PHS has been criticised for cursory review of fiscal aspects of applications. It would not be reasonable to assume that these criticisms apply to all grantees, all applications and all PHS review processes. Nevertheless, there is a distinct danger that the lack of discriminatory review of applications by the grantee administration, before submission to the PHS will sometimes lead to excessive or irrelevant budgetary requests and set the stage for waste or later administrative difficulties. The high disapproval rate, particularly for new applications—many of them arising from institutions of considerable scientific stature and depth of staffing—indicates lack of preliminary screening of applications for major scientific inadequacies before the applications are submitted to the Public Health Service.[98]

It is very important that institutions develop adequate machinery and leadership for internal review and documentation of those administrative decisions that are intimately related to the conduct of research, such as the need for equipment and supplies requested by investigators and the propriety of charging travel expenses to particular projects. These are matters which came within the purview of the NIH pilot study and which deserve further and more intensive PHS attention.

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[97] Anne R. Somers and Herman M. Somers, "Grantsmanship and Stewardship: A Public View," *Public Health Reports*, August 1965, p. 666.

[98] Third and Final Report of a Special Study Committee, *A Study of Increasing the Role of Grantee Institutions in the Management of Research Projects Funded by Public Health Service Grants* (Apr. 15, 1966), p. 48.

How carefully and systematically institutions supervise the use of grants on an institution-wide basis is, in the final analysis, the real key to the efficient and prudent expenditure of Federal research and training funds.

The public has a right to expect that institutions which receive Federal grants for projects requiring relatively small amounts of institutional money will exercise the same prudence and care as they do in spending their own funds. This is not always the case. The committee is aware of instances where office and scientific equipment has been purchased from large research grants in quantities far exceeding any reasonable relationship to the project or the number of investigators participating in it.

Project grants are intended for the purchase of equipment and supplies necessary for the particular projects, and not for the general purpose of instrumenting an institution or providing funds for stockpiling useful items for the future. The temptation is understandably great. However, it is the institution's obligation to establish adequate policies and controls to prevent such abuses, and the Federal agency's responsibility to ascertain that grantees are fully informed and, further, have adequate and effective management controls.

Three years ago a committee of the National Academy of Sciences emphasized the need for strengthening the responsibility of universities for Federal grants. It said:

> The touchstone of the university stewardship of Government funds is the rule that Federal grant money should be expended with the same prudence, economy, and probity that governs the expenditure of university funds from other sources. This rule works well only to the extent that the university has clear policies for the expenditure of large sums. Unfortunately, while Federal research money now equals the entire university budget of a few years ago, adequate mechanisms for supervising its proper, productive use are sometimes lacking.[99]

Dean Price of Harvard's John Fitzgerald Kennedy School of Government has sized up the problem of grant accountability this way:

> Now I am unable to join those who deny that there is a problem, or that it can be dealt with by asserting that professors are morally superior to other people and can be trusted with funds without being subjected to any administrative check whatever. A few years of experience in a grant-making foundation is likely to give anyone a more pessimistic view of human nature. Nevertheless, it is by no means clear that we can solve the problem by imposing on the universities the kind of overly detailed centralized checks that, within the Government itself, have proved so wasteful and so destructive of responsibility.
>
> Perhaps the first thing is for the universities themselves to recognize their own responsibilities more clearly. It is now obvious that their relationship to the Government is now for them big business, and it up to them to organize them-

[99] Committee on Science and Public Policy, National Academy of Sciences, *op. cit.*, p. 91.

selves to handle matters accordingly. On this point I need say no more than was said last year by the Committee on Science and Public Policy of the National Academy of Sciences in its report "Federal Support of Basic Research in Institutions of Higher Learning." The strengthening of university administration, in order to discharge fully whatever responsibility for the custody and expenditure of public funds may be involved in research grants, is a basic necessity.[100]

From the Federal viewpoint, Dean Price believes:

> We must find ways to delegate authority and encourage initiative and responsibility in the relation between Government and universities. We should be able to do so at least as well in this relationship as in State grants-in-aid, where the institution which receives the grants is made more generally responsible for the detailed accountability.
>
> But this depends on a proper system of incentives, and *that* we do not yet have. * * *[101]

He adds:

> The problem cannot be solved by detailed bookkeeping requirements. It can only be solved by a system which gives the university an incentive to take the same point of view as that required by the higher interests of Government policy. And this is of course the most powerful argument for moving, at least in part, from a system which bases support for research on a series of small narrowly defined projects to a system of broader general grants—to the "program project" or the institutional grant.[102]

The committee agrees that we must find ways to encourage institutions to assume more initiative and responsibility in the management of Federal grants. Just what incentives would facilitate this process is not clear. Forms of research support broader than project grants might serve this purpose if academic institutions were permitted to use unspent research money for educational purposes. This, however, would constitute a considerable departure from basic Federal research grant policies and presupposes an equitable distribution of such funds among educational institutions.

There is some precedent for this approach in the NIH general research support and biomedical sciences support grants, which, although computed entirely on the basis of an institution's research expenditures, are available for training as well as research purposes. As is pointed out elsewhere in this report, these programs do not provide an equitable distribution of program funds among institutions; they exclude in particular many schools that confer graduate degrees in the biomedical sciences because they are not already substantial NIH grantees.

The general research support program serves as a useful institutional aid mechanism. But, as noted in chapters IV and VII, it is in need of certain modifications to eliminate abuses and provide for the equitable treatment of smaller and less wealthy institutions.

[100] Don K. Price, "Federal Money and University Research," *Science* (Jan. 21, 1960), p. 287.
[101] *Ibid.*, p. 288.
[102] *Ibid.*

This program provided almost $52 million in 1967, equal to approximately 8 percent of the total amount appropriated for NIH and NIMH research grants. The Public Health Service Act permits up to 15 percent of the NIH (and NIMH) appropriation for research grants to be used for the general research support program.

GRS grants presently serve a wide variety of institutional purposes, including the funding of faculty salaries, trainee stipends, libraries and other central facilities, and new as well as established research projects. In many instances GRS funds are available for exploratory projects and to finance the research of young, inexperienced investigators.

The committee believes that institutional forms of support can be of great value to universities and other grantees engaged in PHS research. However, ***the committee recommends that the percentage of grant funds allocated to the general research support program not be increased, and no new forms of institutional support be initiated, until (1) PHS has modified GRS policies for a more equitable and efficient distribution of these funds, as recommended earlier in this report, and (2) PHS or HEW is prepared to promulgate grants management standards and to determine that institutions wishing to be eligible for research support are in compliance with those standards.***

(b)

APPENDIXES

Appendix 1.—An Analysis of Data on Fiscal Year 1965 NIH Research Grants to Selected Institutions

Child Research Center of Michigan

Four of the six grants made in fiscal year 1965 included indirect cost allowances in excess of the established rate (10 percent). Three of the grants were made at 20 percent of total direct costs, the maximum rate permitted by the appropriation act.

Friends of Psychiatric Research at Spring Grove State Hospital

All 10 of the grants awarded during the fiscal year contained indirect cost allowances in excess of the established rate (14 percent). Eight of the grants were made at the 20-percent maximum rate.

George Washington University

Of the seven grants awarded for off-campus research, all were in excess of the established rates (departmental, 24 percent of salaries and wages; nondepartmental, 12 percent of S. & W.). Six of these grants were made at the 20-percent rate and the seventh at 37 percent of salaries and wages. In addition, one large grant for off-campus research was erroneously classified as on campus, with indirect costs paid at the maximum rate of 20 percent of allowable direct costs.

Johns Hopkins University

Of the five grants identified as off-campus projects, all were awarded at 20 percent of total direct costs, which is substantially above the established rate (16 percent of S. & W.).

Massachusetts General Hospital

Seventy-six of the 90 grants awarded to this institution were made at 20 percent and above the established indirect cost rate (17 percent until Sept. 30, 1964, and 19 percent thereafter).

Massachusetts Health Research Institute

No grants made at rates above the established rate.

Medical & Health Research Association of New York City, Inc.

No grants made at rates above the established rate.

Harvard University

A statistical sampling by the Public Health Service of 201 grants awarded to Harvard University, totaling $8.6 million, for research performed off campus in affiliated hospitals, disclosed that in every instance 20 percent of total direct costs was included in the grant for indirect costs instead of the 13.9-percent rate established for such grants.

University of California

A sample of only two grants was provided for off-campus research projects exclusive of those performed in VA hospitals; in both cases the rates substantially exceeded the 12.6-percent rate established for off-campus research. The subcommittee had requested a statistically significant sample of the NIH grants to the University of California for off-campus research projects, but the Public Health Service was unable to provide this information.

APPENDIX 2.—By the Comptroller General of the United States, June 1966. Report to Intergovernmental Relations Subcommittee. Committee on Government Operations. House of Representatives. Review of certain aspects of indirect cost allowances for research projects. Public Health Service. Department of Health, Education, and Welfare.

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-114836 JUN 30 1966

Dear Mr. Chairman:

In response to a request of March 28, 1966, from a staff member of the Intergovernmental Relations Subcommittee, Committee on Government Operations, House of Representatives, the General Accounting Office has reviewed certain aspects of indirect cost allowances related to selected research project grants awarded by the Public Health Service, Department of Health, Education, and Welfare, and administered by the National Institutes of Health. Our findings and conclusions are summarized in this letter and described in detail in the accompanying report.

In accordance with the request, our review was directed primarily toward ascertaining (1) whether research projects conducted at off-campus locations by the University of California (Berkeley and Los Angeles campuses) were identifiable from available agency records and whether related information requested by the Subcommittee had been withheld by the Public Health Service, (2) the identity of grants awarded for research to be performed at Veterans Administration hospitals and whether indirect cost allowances made at or near 20 percent of allowable direct costs for these grants were based upon negotiation and supporting justification, and (3) the status of audits of indirect costs and of actions to recover indirect cost overpayments at Harvard and Johns Hopkins Universities.

In our analysis of agency grant files pertaining to 282 of the 488 fiscal year 1965 grants in support of investigators at the Berkeley and Los Angeles campuses of the University of California, we found that information in the files was not sufficient in all cases to permit a positive identification of those research projects that were conducted in whole or in part at off-campus locations. However, we were able to identify 43 grants which were for projects indicated to have been conducted off campus or partly off campus but which included indirect cost allowances at the on-campus rates. For 10 of these projects indicated to have been conducted wholly off campus, we estimate that indirect cost allowances were about $11,000, or about 57 percent greater than the amount which would have been awarded had the off-campus rates

been applied. Available information was not sufficient to enable a similar comparison for those projects indicated to have been conducted partly off campus.

We also examined into the efforts made by the National Institutes of Health to furnish information requested by the Subcommittee on off-campus projects at the University of California. We found that, while efforts had been made to obtain the requested information, the steps taken were not properly designed for identifying off-campus projects to the extent possible on the basis of available information. The Public Health Service did not consider the information obtained through these steps to be responsive to the request and accordingly did not transmit the information to the Subcommittee.

We believe that a positive identification of the location of the conduct of research projects financed through Public Health Service grants would not be possible on the basis of existing Public Health Service records. In the interests of guarding against this situation in the future and of enabling a proper determination to be made of the amount of indirect costs applicable to Government sponsored research, we believe that the Public Health Service should require grantees to state in their grant applications the location or locations at which the research will be performed and the portion to be performed at each location and to subsequently report the location or locations at which the research was actually performed.

We reviewed available information relating to 50 grants awarded to 27 grantees in fiscal year 1965, with indirect cost rates at or near 20 percent, for research to be conducted in whole or in part in Veterans Administration hospitals. We found that the indirect cost rates for 19 of these grants had been negotiated; however, no information in support of the negotiated rates was contained in the pertinent files for 6 grants and information tending to support the rates was contained in the files for 13 grants.

Of the remaining 31 of the 50 grants, an indirect cost rate of 20 percent of total direct costs had been allowed for 22 grants on a provisional basis, subject to later adjustment after audit, and composite

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indirect cost rates, computed on the basis of 5 percent of direct costs for the portion of the research to be performed at Veterans Administration hospitals and 20 percent for the portion to be performed on campus, had been awarded for 9 grants. The composite rates ranged from 16.25 to 18.8 percent of total allowable direct costs.

In addition, for 4 of the 27 grantees, we noted that various indirect cost rates had been used by the awarding institutes in computing indirect cost allowances to the same grantee for research conducted in Veterans Administration hospitals.

On the basis of our review, it appears that varying practices have been followed in awarding indirect cost allowances for grant-supported research conducted in whole or in part at Veterans Administration hospitals and that, in many of the awards made on the basis of a 20 percent provisional rate, recoveries will be required after audit. It appears also that where rates were negotiated the bases for negotiation had not in all cases been documented. Therefore, we believe that the Public Health Service should require that uniform policies and procedures be followed by institutes and divisions making grants in their determinations of indirect cost allowances for grant-supported research to be conducted at Veterans Administration hospitals; that a realistic provisional rate be used when a rate for an institution has not been established through negotiation or otherwise; and that, when a rate has been established for a particular institution for research to be conducted wholly at Veterans Administration hospitals, the rate be used by all awarding institutes and divisions.

We found that as of April 1966 neither the audit at Harvard University nor the audit at Johns Hopkins University had progressed to a point where Public Health Service officials could furnish us with an estimate of potential recoveries of indirect costs. The audit at Harvard University was still in progress. The audit work at Johns Hopkins University had been completed and tentative indirect cost rates had been developed; however, according to agency officials, upward adjustments may be required in these rates. It appears that, even if rate adjustments are made, recoveries of part of the indirect cost allowances previously paid to Johns Hopkins University will be required.

Our review showed that the information furnished to your Subcommittee in November 1964, concerning the status of audits at Harvard and Johns Hopkins Universities, was erroneous. We believe, however, that the erroneous information resulted from a misinterpretation of information by agency officials and that there was no deliberate effort to mislead the Subcommittee.

In accordance with agreements reached in discussions with the staff of your Subcommittee, we have not requested formal comments of the Department of Health, Education, and Welfare on the information contained in this report nor have we advised the agency of the procedural changes which we believe are necessary to enable a more proper determination to be made of indirect cost allowances for research project grants.

We plan to make no further distribution of this report unless copies are specifically requested and then distribution will be made only after your approval has been obtained or public announcement has been made by you concerning the contents of the report.

Sincerely yours,

Comptroller General
of the United States

The Honorable L. H. Fountain, Chairman
Intergovernmental Relations Subcommittee
Committee on Government Operations
House of Representatives

REPORT ON REVIEW OF CERTAIN ASPECTS OF INDIRECT COST ALLOWANCES FOR RESEARCH PROJECTS PUBLIC HEALTH SERVICE DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

INTRODUCTION

Pursuant to a request of March 28, 1966, from a staff member of the Intergovernmental Relations Subcommittee, Committee on Government Operations, House of Representatives, the General Accounting Office has reviewed certain aspects of selected indirect cost allowances related to research project grants awarded by the Public Health Service (PHS), Department of Health, Education, and Welfare (HEW), and administered by the National Institutes of Health (NIH).

Our review was directed primarily toward ascertaining (1) whether research projects conducted at off-campus locations by the University of California (Berkeley and Los Angeles campuses) were identifiable from available agency records and whether related information requested by the Subcommittee had been withheld by PHS, (2) the identity of grants awarded for research to be performed at Veterans Administration (VA) hospitals and whether indirect cost allowances made at or near 20 percent of allowable direct costs for these grants were based upon negotiation and supporting justification, and (3) the status of audits of indirect costs and of actions to recover indirect cost overpayments at Harvard and Johns Hopkins Universities. In our review, we examined pertinent PHS grant files and records, including indirect cost proposals submitted by the grantees and records of negotiations, pertaining to the

indirect cost allowances provided for in the selected research grant agreements. We also discussed various related matters with cognizant NIH and PHS officials.

BACKGROUND

The research programs administered by NIH are authorized by the Public Health Service Act (42 U.S.C. 241). The act provides that the Surgeon General, PHS, encourage, cooperate with, and render assistance to appropriate public authorities, scientific institutions, and scientists in the conduct and coordination of research, investigations, experiments, demonstrations, and studies relating to the cause, diagnosis, treatment, control, and prevention of physical and mental diseases and impairments of man. Under this authority the Surgeon General, through NIH and other PHS organizational units, has established various grant-in-aid programs in support of research, consisting largely of grants for specific projects. During fiscal year 1965, NIH awarded 15,183 research project grants totaling about $539 million. Other PHS organizational units awarded 1,189 research project grants totaling about $35 million during fiscal year 1965.

Although research project grants can be made directly to individuals, almost all the NIH grants have been made to universities, colleges, medical schools, hospitals, and other public and private institutions acting as sponsors for investigators named in the grant agreements. The grants are intended to pay for (1) direct costs, such as the salaries of professional and nonprofessional personnel and the costs of consumable supplies and equipment, necessary to the conduct of the projects and (2) indirect costs allocable to the projects, except for grants to nondomestic institutions and to individuals. PHS has defined indirect costs as costs which, because their incurrence is usually for common or joint objectives, are not readily subject to treatment as direct costs of research projects but are supportive in nature and are

incurred by the sponsoring institution for such matters as personnel management services, accounting and purchasing functions, usual utilities, and normal maintenance and protection of the sponsoring institution's facilities. Grant agreements made during fiscal year 1965 provided for payments of indirect costs in terms of a percentage of the salaries and wages or of the allowable direct costs of each project.

Indirect cost allowances for research projects may be made on the basis of percentage rates (1) established through negotiation, (2) agreed to provisionally, subject to adjustment when a final rate has been negotiated, or (3) arrived at as a composite of rates established by the preceding methods.

Negotiated rates may be predetermined fixed-percentage rates established for an individual grantee on the basis of information obtained during appropriate audits by the grantor agency, or they may be rates established by the Financial Management Branch, NIH, on the basis of cost proposals submitted by the grantee institution.

Indirect cost rates are also negotiated when the research is to be conducted fully or partially at a Federal institution, such as a VA hospital. Although the PHS has not established a firm policy on the rate to be used, the accepted practice has been to use a rate of 5 percent of allowable direct costs for the portion of the research to be conducted at a Federal institution.

Provisional rates are used when no institutional rate has been established. PHS operating procedures provide that in such cases the indirect cost allowance be computed at the maximum rate of 20 percent of total direct costs, subject to reduction of the

total grant or refunding of the grant if the institution's substantiated indirect cost rate were subsequently determined to be less than 20 percent of direct costs.

When part of the research is conducted at an off-campus location and part is conducted on campus, composite rates based on the grantee's estimate of the percentage of research to be conducted at each location have been used. For example, if a grantee estimates that 50 percent of the research is to be conducted at a Federal facility at which the use of a 5-percent rate is indicated and 50 percent is to be conducted on campus at an institution at which a provisional rate of 20 percent is used, a composite rate of 12-1/2 percent would be used.

Before July 1955, allowances for indirect costs of research projects were administratively established by PHS at a rate of 8 percent of allowable direct project costs. Effective for projects starting on or after July 1, 1955, the rate was administratively increased to provide up to 15 percent of allowable direct project costs. Two years later, a legal limitation on indirect cost payments to grant recipients was established for the first time by the Departments of Labor, and Health, Education, and Welfare Appropriation Act, 1958 (71 Stat. 210). Section 208 of the act stated that:

> "None of the funds provided herein shall be used to pay any recipient of a grant for the conduct of a research project an amount for indirect expenses in connection with such projects in excess of 15 percentum of the direct costs."

The 15-percent indirect cost limitation remained in effect by inclusion of the same provision in subsequent appropriation acts until the Departments of Labor, and Health, Education, and Welfare

Appropriation Act, 1963 (76 Stat. 361), increased the limitation to 20 percent with no other change in the provision. Also, the Statement of the Managers on the Part of the House attached to the conference report on the 1963 act reads in part:

> "The committee on conference desires that the Department carefully review the expenses incurred under research grants with a view to allowing no more than the actual expenses for indirect costs in cases where such indirect costs amount to less than 20 percent of the direct costs."[1]

As a result of the comments in the conference report, PHS revised its policy in June 1963--retroactive to grants approved on or after January 1, 1963--to require the use of an indirect cost rate of 20 percent or of a lesser percentage when a lower rate has been established in connection with other Government contracts with the same institution or, when a rate has not been established, the use of a provisional rate of 20 percent, subject to a reduction of the total grant if the institution's substantiated rate were subsequently determined to be less than 20 percent. The indirect cost limitation provision in the 1963 appropriation act was included also in the 1964 and 1965 appropriation acts, and the desire that payments for indirect costs not exceed actual costs incurred by the grantees was restated in the reports of both the Senate and the House of Representatives Committee on Appropriations in 1964.

The 20-percent limitation on payments of indirect costs was not included in the Departments of Labor, and Health, Education, and Welfare Appropriation Act, 1966 (79 Stat. 589). However, section 203 of the act (79 Stat. 608) provides:

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[1] H. Rept. 2100, 87th Cong., 2nd sess., p. 10.

> "None of the funds provided herein shall be used to pay any recipient of a grant for the conduct of a research project an amount equal to as much as the entire cost of such project."

The PHS Grants Manual, effective between January 1, 1963, and April 1, 1964, stated that PHS would apply the principles set forth in Bureau of the Budget Circular No. A-21 to the fullest extent practicable in determining indirect cost rates for all grantee institutions. The manual further provided, however, that the indirect cost rate established for an institution for a given period was to apply for all PHS research grants awarded to that institution during that period.

Regulations relating to PHS grants for research projects were first issued in September 1963 (28 F.R. 10420). Section 52.32(b) of the regulations provides:

> "(b) Determination of amount of award for indirect costs. Subject to such maximum amounts or percentages as may be prescribed by law and to accountability as provided in §52.41, the amount of any award for the indirect costs of any project shall be calculated by the Surgeon General either (1) on the basis of his estimate of the actual indirect costs reasonably related to the approved project, or (2) on the basis of a percentage of all, or a portion of, the estimated direct costs of the approved project when there are reasonable assurances that the use of such percentage will not exceed the approximate actual indirect costs."

Despite this provision in the regulations, the revised Grants Manual--effective between April 1, 1964, and July 1, 1965--continued the earlier requirement that the indirect cost rate established for an institution for a given period be applied to all grants to that institution for that period.

The PHS "Grants for Research Projects--Policy Statement" effective July 1, 1965, provides for negotiation of separate rates for indirect costs for certain types of grants. Included are grants where a Federal institution is the grantee or where the research is to be fully or partially conducted at a Federal institution and grants where limited supporting services are furnished by the grantee institution to support a project in which a major part of the work is to be performed off campus.

The Surgeon General has provided for the audit of grants for health and related research projects since 1946. Section 52.23(b) of the PHS regulations provides for audit by representatives of the Surgeon General and stipulates that "*** acceptance of any grant award under section 52.14 shall constitute the consent of the grantee to inspection and fiscal audit ***." The PHS Grants Manual effective April 1, 1964, and the PHS policy statement "Grants for Research Projects" effective July 1, 1965, each include a section on audit and provide for the audit of grant funds.

Before July 1, 1965, responsibility for the audit of research grant funds was assigned to NIH. On July 1, 1965, the audit function was transferred to the Office of the Secretary, HEW. In carrying out their audit responsibilities, both the NIH and the HEW audit groups have used in part the services of cognizant Department of Defense audit groups to provide information on indirect cost rates to be used at grantee institutions.

FINDINGS

IDENTIFICATION OF OFF-CAMPUS PROJECTS AT THE UNIVERSITY OF CALIFORNIA

We analyzed grant files at five institutes or divisions of the NIH and at one bureau of the PHS, which had awarded 282 PHS grants in fiscal year 1965 totaling $12.5 million in support of investigators at the Berkeley and Los Angeles campuses of the University of California. During fiscal year 1965, a total of 488 grants amounting to $18.5 million were awarded to investigators at the two campuses by organizational units of PHS. The organizational units selected for review were those whose research projects were, in our opinion, of the type likely to be performed off campus. We found that information in the grant files was not sufficient in all cases to permit a positive identification of those research projects which were conducted in whole or in part at off-campus locations. However, we were able to identify 43 grants for projects indicated to have been conducted off campus or partly off campus. Included in the 43 projects were 14 conducted at VA hospitals with indirect costs allowed at 10 percent of total direct costs or at a composite rate arrived at after considering the proportion of the research to be conducted at the VA hospital and at the on-campus locations.

Information in the files for the remaining 29 grants indicated that they were conducted totally or partly off campus; however, allowances for indirect costs for these grants were made at the established on-campus indirect cost rates. For example, we found that indirect costs were allowed at the on-campus rate in a grant awarded to the University of California at Berkeley for a juvenile delinquency study which was to be performed at an off-campus location. The grant application showed that the research was to be conducted in rented space at Los Angeles. The budget included in

the application for fiscal year 1965 requested funds for direct payment of items such as rent, utilities, telephone, and equipment and office maintenance.

The 29 grants are listed in schedule 1 (see p. 23) by campus and classified on the basis of our analysis of whether the projects were conducted off campus or partly off campus. The schedule includes a comparison for the totally off-campus projects between the amount of indirect cost awarded and the amount that would have been awarded if the off-campus rate of 11.9 percent of total allowable direct costs had been used to compute the amount. The schedule shows that the indirect cost allowances in the grant were $11,370, or about 57 percent greater than the amount which would have been awarded the 10 off-campus projects had the off-campus rate been applied. We did not make a similar comparison for the projects conducted partly off campus because the grant files did not contain sufficient information for us to identify the percentage of research conducted at off-campus locations.

During 1965, in response to a request from the Intergovernmental Relations Subcommittee of the Government Operations Committee, House of Representatives, NIH unsuccessfully tried to obtain information from the University of California, as well as from the NIH institutes and divisions which made the awards, to determine which of the PHS grants awarded to grantees at the Berkeley and Los Angeles campuses were conducted at off-campus locations.

In a further effort to obtain the information, NIH reviewed 421 "Notification and Statement of Award" notices for awards made to grantees on the two campuses in fiscal year 1965. In this review, grants were classified as being conducted off campus on the basis of an indicated indirect cost rate of less than the on-campus indirect cost rate. Grants on which indirect costs were awarded at

the on-campus rates were not examined to ascertain whether the research was being conducted off campus. Using this procedure, NIH identified 42 fiscal year 1965 research grants, all awarded to grantees at the Los Angeles campus, as being conducted at off-campus locations. Further analysis by NIH showed that, of the 42 projects, 36 were conducted at VA hospitals and 6 at the University of California Center for Health Sciences. (In our review, we found that research work for the 6 projects was also actually conducted in whole or in part at VA hospitals.)

We found that, while efforts had been made to obtain the requested information, the steps taken were not properly designed for identifying off-campus projects to the extent possible on the basis of available information.

The information developed under the procedures described above was forwarded to the PHS in December 1965, accompanied by a letter from NIH expressing the opinion that the information should not be forwarded to the Intergovernmental Relations Subcommittee since such action might jeopardize NIH efforts to resolve the indirect cost problem.

We were informed by a PHS official that the information furnished by NIH was considered inadequate and not responsive to the Subcommittee's request and that the information, therefore, was not submitted to the Intergovernmental Relations Subcommittee. This is the only incident of information being withheld from the Subcommittee that came to our attention in the course of our review.

On the basis of our review pertaining to the University of California, we believe that a positive identification of the location of the conduct of research projects financed through PHS grants would not be possible from existing PHS records. In the interests of guarding against this situation in the future and of

enabling a proper determination to be made of the amount of indirect costs applicable to Government-sponsored research, we believe that PHS should require grantees to state in their grant applications the location or locations at which the research will be performed and the portion to be performed at each location and to subsequently report the location or locations at which the research was actually performed.

INDIRECT COST RATES FOR SELECTED PROJECTS CONDUCTED AT VETERANS ADMINISTRATION HOSPITALS

We reviewed the general information files maintained by the Division of Research Grants (DRG), NIH, relating to 50 grants awarded in fiscal year 1965 with indirect cost allowances at or near a rate of 20 percent for research to be conducted in whole or in part in VA hospitals. The grants were awarded to a total of 27 grantee institutions. The indirect cost rates allowed to the 27 grantees by NIH are presented in schedule 2. (See p. 24.) We used information in the DRG files to ascertain whether the indirect cost rates allowed the grantees by NIH were arrived at by negotiation and, if so, whether the documentation in support of the negotiation was adequate.

We found that negotiated indirect cost rates had been used by NIH in connection with indirect cost allowances for 19 grants made to six grantee institutions. Cost information and correspondence tending to support the negotiated rates used for 13 grants to four of the institutions were available in the DRG files. We found no information in the files in support of the negotiated rates used in connection with the remaining 6 grants which had been made to two institutions.

Information in the DRG files showed that indirect cost allowances for 22 other grants were made at a rate of 20 percent of allowable direct costs, the maximum legal rate in effect at the time of the awards. Information furnished by the awarding NIH institutes in response to a request of the Intergovernmental Relations Subcommittee indicated that indirect cost allowances for 14 of these awards were based upon provisional rates, that 5 grants involved only limited use of the VA facility, and that the rates used for 3 grants were in error--NIH indicating that in two cases

a rate of 5 percent should have been used and in the third a negotiated rate of 19 percent should have been used.

Indirect cost allowances for the remaining 9 of the 50 grants reviewed were made at a composite rate computed on the basis of 5 percent for the portion of the research to be performed at the VA facility and 20 percent for the portion of the research to be performed on campus. These rates ranged from 16.25 to 18.8 percent of allowable direct costs.

In addition, for four grantees which received grants from a number of NIH institutes, we noted that the various awarding institutes used different indirect cost rates in computing indirect cost allowances to the same grantee for research projects conducted in VA hospitals. For example, Yeshiva University was awarded three grants during fiscal year 1965 for support of research to be conducted in VA hospitals. Indirect costs for research to be conducted in VA hospitals under two of the grants, awarded by the National Institute of Arthritis and Metabolic Diseases, were computed at a 5-percent rate; however, indirect costs under the third grant, awarded by the National Institute of General Medical Science, were computed at a 20-percent rate. The use of provisional rates when the use of lower rates is warranted and appropriate for computing indirect cost allowances, such as those noted above and in schedule 3 (see p. 26), results in the unnecessary obligation and/or disbursement of Federal funds and points out the need for more effective management of grant programs. Schedule 3 presents details of the various rates which had been allowed in connection with awards to the four grantees.

On the basis of our review, it appears that varying practices have been followed in awarding indirect cost allowances for

grant-supported research conducted in whole or in part at VA hospitals and that, for many of the awards made on the basis of a 20 percent provisional rate, recoveries will be required after audit. It also appears that where rates were negotiated the bases for negotiation had not in all cases been documented. Therefore, we believe that the PHS should require that uniform policies and procedures be followed by institutes and divisions making grants in their determinations of indirect cost allowances for grant-supported research to be conducted at VA hospitals; that a realistic provisional rate be used when a rate for an institution has not been established through negotiation or otherwise; and that, when a rate has been established for a particular institution for research to be conducted wholly at VA hospitals, the rate be used by all awarding institutes and divisions.

STATUS OF AUDITS OF INDIRECT COSTS AND OF ACTIONS TO RECOVER INDIRECT COST OVERPAYMENTS AT HARVARD AND JOHNS HOPKINS UNIVERSITIES

We found that as of April 1966 neither the audit for fiscal year 1964 at Harvard University nor the audit for fiscal year 1963 at Johns Hopkins University had progressed to a point where PHS officials could furnish us with an estimate of potential recoveries of indirect costs.

Harvard University

Pursuant to the Subcommittee's request, we examined into whether any action was taken to recover indirect cost overpayments at Harvard University as a result of audits reportedly completed as stated in a PHS memorandum dated November 19, 1964, a copy of which had been furnished to the Subcommittee. We were advised by NIH officials in April 1966 that the HEW regional auditors were still working on the audit for fiscal year 1964 and had returned to Harvard University to recheck certain expense figures. At that stage of the audit, NIH could not estimate whether Harvard University had been overpaid indirect costs and thus whether a refund would be forthcoming.

We have been advised that the off-campus projects at Harvard University have been identified as being those which are conducted in hospitals in the Boston area. We were informed that the HEW regional auditors had a list of these projects. We were informed also that the indirect cost rate allowed Harvard University by NIH for off-campus research projects is 13.9 percent of total direct costs.

We were advised by NIH officials that NIH auditors, prior to November 1964, had done only certain work preliminary to undertaking a financial audit at Harvard University. However, the audit referred to in the November 1964 PHS memorandum apparently was either one being made by Department of Defense (DOD) auditors or one which had been made by a national certified public accounting firm under a contract arrangement with NIH.

In regard to the DOD audit, we were informed by NIH officials that the auditors did not adequately consider the overhead costs applicable to PHS research projects in developing an indirect cost rate for fiscal year 1964 for application to Government-financed

projects at Harvard University. Therefore, the NIH auditors at the Boston regional office initiated an audit at Harvard University early in 1965. This audit, delayed somewhat by the transfer of the NIH grants audit group to the departmental level, was referred to in the PHS memorandum of November 9, 1965, to the Subcommittee as being in progress and is currently in the same status.

Johns Hopkins University

An audit covering the fiscal year ended June 30, 1963, has been completed by NIH. However, efforts by NIH to identify off-campus research projects were not too successful--about six off-campus projects having been identified. Rather than developing separate indirect cost rates for on- and off-campus research projects, NIH auditors have developed composite rates for each of the three Johns Hopkins divisions: the Homewood Division, the School of Medicine, and the School of Hygiene and Public Health. NIH officials believe that the composite rates will be lower than the allowable 20 percent of total direct costs and that computation of separate indirect cost rates for off-campus research projects for each division will result only in redistribution of indirect costs among the respective divisions' on- and off-campus PHS research projects with no savings to the Government.

The documentation supporting the composite indirect cost rates developed by NIH shows that the rates applicable to total direct costs are 7.91 percent for the School of Hygiene and Public Health, 9.01 percent for the School of Medicine, and 10.62 percent for the Homewood Division. We were advised by NIH officials that upward adjustments of about 3 percent in these rates may be required. However, even after adjustments, the rates should be considerably below the maximum allowable 20 percent of total direct costs.

NIH has submitted its computation of the composite indirect cost rates for application to fiscal year 1963 to Johns Hopkins for review and expects to receive a formal proposal relating to establishment of an indirect cost rate from the University in June or July 1966. Since PHS has provisionally allowed Johns Hopkins 20 percent of total direct costs for indirect costs and since the actual composite indirect cost rate that NIH proposes for application to fiscal year 1963 grants is less, NIH officials stated that it is likely that a refund will be forthcoming from Johns Hopkins, although not specifically from off-campus grants. However, since negotiations are involved, NIH could not furnish us with an estimate of the amount of probable recovery.

NIH officials informed us that the field work on the NIH audit at Johns Hopkins was nearly complete as of November 1964. The officials believed, however, that, due to a misunderstanding between NIH and PHS, the audit referred to in the November 1964 PHS memorandum was one which was performed by a national certified public accounting firm.

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Based on the information obtained during our review, we believe that the information contained in the PHS memorandum of November 19, 1964, concerning the status of the audits at Harvard University and Johns Hopkins University was erroneous. We believe, however, that the erroneous information resulted from a misinterpretation of information by NIH officials and that there was no deliberate effort on the part of either NIH or PHS to mislead the Subcommittee. Also, our review showed that subsequent information on audits at these universities, provided to the Subcommittee on November 9, 1965, was substantially correct.

At the time of our review, neither of the NIH audits at the two universities had resulted in sufficient information to enable us to provide the Subcommittee with an estimate of the amount of indirect costs, previously awarded for PHS-supported research projects, which may be recovered. It appears, however, that some of these funds will be recovered from Johns Hopkins University, although not specifically as a result of indirect cost overpayments for off-campus research projects.

SCHEDULES

SCHEDULE 1

UNIVERSITY OF CALIFORNIA

RESEARCH PROJECTS CONDUCTED AT OFF-CAMPUS LOCATIONS

AND COMPARISON OF INDIRECT COSTS

AT ON-CAMPUS AND OFF-CAMPUS RATES

FISCAL YEAR 1965 AWARDS

Grant number	Indirect cost awarded by PHS at on-campus rates	Indirect cost at 11.9 percent off-campus rate	Difference
OFF-CAMPUS:			
Berkeley:			
MH 10563 -01	$ 1,391	$ 828	$ 563
MH 10160 -01S1	448	267	181
MH 10564 -01	1,122	668	454
MH 7677 -03	18,449	10,978	7,471
MH 11629 -01	1,065	855	210
MH 11628 -01	573	943	-370
MH 8507 -02	468	278	190
MH 11273 -01	1,069	636	433
MH 11487 -01	-	443	-443
Los Angeles:			
NB 5427 -01	6,620	3,939	2,681
Total	$31,205	$19,835	$11,370
PARTLY OFF-CAMPUS:			
Berkeley:			
GM 13197 -01	$ 4,759		
MH 4000 -05S1	2,097		
MH 4000 -06	8,611		
MH 10627 -01	583		
MH 4087 -05	9,686		
MH 1341 -02	10,504		
MH 8565 -02	6,494		
MH 970 -03	11,981		
MH 1430 -02	3,436		
Los Angeles:			
GM 9053 -04	2,605		
GM 11959 -02	703		
MH 11430 -01	700		
MH 4684 -05	5,076		
MH 8744 -02	8,109		
MH 10460 -01	2,985		
MH 89 -07S1	1,610		
MH 89 -08	824		
MH 10083 -01	6,074		
NB 1162 -09	5,890		
Total	$92,727		

RESEARCH PROJECTS

AT

VETERANS ADMINISTRATION HOSPITALS

INDIRECT COSTS AWARDED AT OR NEAR 20 PERCENT RATE

FISCAL YEAR 1965 FUNDS

Grantee institution	Awarding institute (note e)	Number of grants	Rate and basis of indirect cost allowance
Duke University	NHI	1	20 percent - Negotiated
	NIAMD	6	20 percent - Negotiated
George Washington University	NHI	1	20 percent - Negotiated
Harvard University	NHI	1	20 percent - Negotiated
Indiana University	NHI	1	20 percent - Provisional (note a)
	NHI	2	19 percent - Negotiated
	NIAMD	3	19 percent - Negotiated
Johns Hopkins University	NICHD	1	20 percent - Limited use (note b)
Rutgers University	NIMH	1	20 percent - Provisional
Stanford University	NIMH	1	20 percent - Provisional
State University of Iowa	NHI	1	20 percent - Provisional (note c)
Wayne State University	NIAMD	2	17 percent and 18.5 percent - Composite rates (note d)
Yeshiva University	NIGMS	1	20 percent - Provisional
	NIAID	1	18.8 percent - Composite rate (note d)
University of Alabama	NIAMD	1	17 percent - Composite rate (note d)
University of Arizona	NIGMS	1	20 percent - Provisional
	NIAMD	1	17.75 percent - Composite rate (note d)
University of Arkansas	NHI	1	20 percent - Limited use (note b)
	NIMH	1	20 percent - Provisional
University of California			
Berkeley	NIAID	1	20 percent - Limited use (note b)
Los Angeles	NIMH	1	20 percent - Provisional
	NIAMD	1	20 percent - Limited use (note b)
University of Cincinnati	NIMH	2	20 percent - Provisional
University of Illinois	NIMH	1	20 percent - Provisional

SCHEDULE 2
Page 2

RESEARCH PROJECTS

AT

VETERANS ADMINISTRATION HOSPITALS

INDIRECT COSTS AWARDED AT OR NEAR 20 PERCENT RATE

FISCAL YEAR 1965 FUNDS (continued)

Grantee institution	Awarding institute (note e)	Number of grants	Rate and basis of indirect cost allowance
University of Miami	NHI	1	20 percent - Negotiated
	NCI	1	20 percent - Negotiated
	NIMH	1	20 percent - Provisional
	NICHD	1	20 percent - Negotiated
University of Michigan	NIAMD	2	20 percent - Negotiated
University of New Mexico	NHI	1	20 percent - Provisional (note c)
	NIAMD	1	16.25 percent - Composite rate (note d)
University of Pittsburgh	NIMH	1	20 percent - Provisional
University of Southern California	NIMH	1	20 percent - Provisional
University of South Florida	NIMH	1	20 percent - Provisional
University of Washington	NIAMD	1	16.4 percent - Composite rate (note d)
Institute for Behavioral Research, Inc.	NIMH	1	20 percent - Provisional
Oklahoma Medical Research Foundation	NIAMD	1	18.5 percent - Composite rate (note d)
Philadelphia General Hospital	NIAID	1	20 percent - Limited use (note b)
Cedars of Lebanon Mt. Sinai Hospital of Los Angeles	NIAMD	1	18.5 percent - Composite rate (note d)

[a] Rate in error, should be 19 percent.

[b] Provisional rate of 20 percent - awarding institute justification based upon grant applications which show that little use of VA facility was contemplated.

[c] Rate in error, should be 5 percent.

[d] Rate based on grantee's estimate of percentage of research to be conducted off campus. Off-campus portion computed at 5 percent or at off-campus rate. On-campus portion computed at provisional rate of 20 percent.

[e] See schedule 4 for full names of awarding institutes.

SCHEDULE 3

RESEARCH PROJECTS

AT VETERANS ADMINISTRATION HOSPITALS

VARYING INDIRECT COST RATES

USED FOR SAME GRANTEE INSTITUTION

FISCAL YEAR 1965 FUNDS

Grantee institution	Awarding institute (note b)	Number of grants	Rate and basis of indirect cost allowance
Yeshiva University	NIAMD	1	5 percent - Federal facility
	NIAMD	1	18.8 percent - Composite rate (note a)
	NIGMS	1	20 percent - Provisional
University of Arizona	NIAMD	1	17.75 percent - Composite rate (note a)
	NIGMS	1	20 percent - Provisional
University of Miami	NHI	1	20 percent - Negotiated
	NCI	1	20 percent - Negotiated
	NIAID	2	15 percent - Negotiated
	NIMH	1	20 percent - Provisional
	NIGMS	1	15 percent - Negotiated
	NICHD	1	20 percent - Negotiated
University of Pittsburgh	NHI	2	5 percent - Federal facility
	NIMH	1	20 percent - Provisional
	NIAMD	2	5 percent - Federal facility

[a]Rate based on grantee's estimate of percentage of research to be conducted off campus. Off-campus portion computed at 5 percent; on-campus portion computed at provisional rate of 20 percent.

[b]See schedule 4 for full names of awarding institutes.

SCHEDULE 4

NATIONAL INSTITUTES OF HEALTH

IDENTIFICATION OF AWARDING INSTITUTES SHOWN IN SCHEDULES 2 AND 3

NCI - National Cancer Institute

NHI - National Heart Institute

NIAID - National Institute of Allergy and Infectious Disease

NIAMD - National Institute of Arthritis and Metabolic Diseases

NICHD - National Institute of Child Health and Human Development

NIGMS - National Institute of General Medical Sciences

NIMH - National Institute of Mental Health

U.S. GAO, Wash., D.C.

A Grant Program for the Development of the Health Sciences in Institutions of Higher Education

An Administrative Document
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GENERAL RESEARCH SUPPORT BRANCH
DIVISION OF RESEARCH FACILITIES AND RESOURCES
National Institutes of Health
Bethesda, Maryland
20014

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
April 1966

HEALTH SCIENCES ADVANCEMENT AWARD PROGRAM

INTRODUCTION:

The National Institutes of Health has initiated a new program of support to institutions, primarily graduate academic institutions, to aid in the implementation of specific proposals whereby institutions can advance to higher levels of achievement by developing new and strengthening existing health science activities. The program objectives are to accelerate the advancement of existing capabilities in health research and related graduate research educational activities within institutions of higher education which already have demonstrated some achievement in the health sciences or in scientific fields related to the biomedical area; support the advancement of new health research and training endeavors in emerging and less well established academic institutions of higher education which, however, possess an appropriate base for the development of the health sciences; promote the better training of biomedical investigators, and increase the total number of well-trained health scientists.

WHO MAY APPLY:

Health Sciences Advancement Awards are initially limited to institutions of higher education within the United States, its territories and possessions. Preference for Health Sciences Advancement Awards will be given to applicant institutions which offer the greatest promise for advancing to new levels of health science activity. Institutions eligible to apply under this program include: (1) a university or any one or a combination of its major organizational components such as one or more of its health professional schools, entire medical center, or colleges, and (2) colleges which grant master or doctoral level degrees and health professional schools which are not a part of a university.

EXCEPTION: In university systems each of the campuses and colleges which are listed in boldface type in the most recent edition of the "Education Directory, Part 3, Higher Education," issued by Office of Education, Department of Health, Education, and Welfare is considered a separate institution and must file separately. Examples of university systems are the State University of New York, the Texas A & M University System, and the University of California.

IMPORTANT: A university, with the exception noted above, may submit only one application, whether this includes one or more than one of the university's major organizational components. The application, however, does not have to embody programs which formally involve the total university structure. For example, a university may apply for a Health Sciences Advancement Award on behalf of its school of medicine, its entire medical center, or a division which bridges several schools or colleges within the university.

GENERAL CONDITIONS OF HEALTH SCIENCES ADVANCEMENT AWARDS:

Health Sciences Advancement Awards will be made on a competitive, non-renewable basis, and will provide funds to a grantee for no more than a single, five-year period. No grant may be awarded without a prior recommendation of approval by the National Advisory Health Council and acceptance of this recommendation by the Surgeon General. At the time that a grant is funded the institution will receive an official "Notification of Grant Awarded" together with supplementary informational materials relevant to administration of the grant. As the result of NIH experience in its General Research Support program, grantee institutions will be given wide latitude in exercising discretion in grants management matters customarily reserved to the funding agency. Usual administrative and fiscal controls will be required of the grantee together with annual progress and expenditures reports. Levels of support will be negotiated annually and, if justified, funds may be carried forward throughout the project period of the grant. The principles of cost-sharing will be applicable to these grants. Health Sciences Advancement Award funds may not be used for construction. Applicants in need of additional facilities should consider whether an application under Title VII A of the Public Health Service Act might meet the anticipated need. The general level of funding for each grantee is expected to average about $1-$3 million for the total period of support. PHS requirements relative to civil rights, patents, conduct of clinical research using human beings as subjects, etc. will apply to Health Sciences Advancement Awards.

PROCEDURE FOR APPLYING:

Because of the interest this program is expected to receive and the relatively modest level of funding available for next year, it is requested that each interested institution submit at this time only a letter of intent and summary statement of the institution's plans. Guidelines are presented below concerning the nature of the information this summary should contain. A deadline of July 15, 1966 for receiving all letters and summaries has been established. In recognition of the fact that each institution has its own unique and separate set of conditions, interests and needs, flexibility will be exercised in the

evaluation and assessment of its proposed program. For this reason, only general guidelines are provided so as not to restrict institutions from submitting plans most suitable to their requirements.

REVIEW PROCEDURES:

Summaries will be reviewed for the purposes of evaluating those which best appear to meet the stated objectives of the program. Following the review of the summary, the applicant will be informed of its status; a relatively small number of applicants will be invited to prepare full-scale, formal applications for subsequent review through a dual review procedure. The number of institutions invited to prepare full-scale applications will depend in part upon the funds available in FY 1967 and those projected for future years. As expansion of the program occurs, future additional open filing periods will be announced.

WHAT TO SUBMIT:

1. A letter of intent signed by the President or Chief Executive Officer of the institution which attests to his approval for the proposal.

2. A face page (see suggested format) identifying the title of the proposal, the institution, its address, major organizational components involved, name of program director, his title, address and telephone number, estimated first year and total costs of the program and amounts requested of the NIH, and date of application.

3. A summary of approximately 3,000 to 5,000 words which includes the following information:

   a. INFORMATION ABOUT THE PROPOSED PLAN

      Nature of the program to be supported.

      Principal goals, areas and fields to be advanced.

      Relationship of the plan to the institution's overall development plans.

      Major changes that can be expected if objectives are reached.

      Facilities available and those needed to carry out the proposed program. (Funds for new construction should not be included since these cannot be provided from these grants.)

Specialized research equipment which will be needed.

Evidence of the commitment of the university's resources to the plan.

b. INFORMATION ABOUT THE BUDGET

Estimate of the total and each year's cost of the plan by major category of expenditure (e.g., personnel, equipment, research training support) showing: (1) the institution's proposed share of the costs and, (2) the amounts requested of the National Institutes of Health.

Present commitments of the applicant institution, state legislature, community, etc.

Plans and principal sources for maintenance of program beyond the termination of the grant.

c. INFORMATION ABOUT THE APPLICANT INSTITUTION

Present areas of scientific strength throughout the institution, including health research and research training programs, their scope and magnitude.

Total current Federal support for the institution's health-related programs, (e.g., NSF, DOD, NASA, AEC, PHS).

Major science facilities built or acquired in past five years. Identify scientific area (physics, biological sciences, etc.), total cost and approximate amounts obtained from Public Health Service.

In order to expedite the internal processing and review of summaries, it is requested that an original and three carbon copies of each letter of intent and summary statement be provided.

WHEN AND WHERE TO SUBMIT LETTER OF INTENT AND SUMMARY:

For consideration for a grant for FY 1967, the requested material must be postmarked no later than July 15, 1966, and should be mailed to:

Health Sciences Advancement Award Program
General Research Support Branch
Division of Research Facilities and Resources
National Institutes of Health
Bethesda, Maryland 20014

(Suggested Format for Face Page Summary)

SUMMARY OF HEALTH SCIENCES ADVANCEMENT AWARD PROPOSAL

FR _____
(Applicant leave blank)

Title of Proposal: _____

Applicant Institution: _____

Major Organizational Components Represented: _____
(e.g. Total University, School of Medicine only)

Address: _____

Telephone No.: _____

Name of Program Director: _____

Title: _____

Address: _____

Telephone No.: _____

Budget Summary:

	Total Cost	Estimated Requested of NIH
First Year:		
Total Project Period (____ years):		

Date: _____

Appendix 4.—Number of Doctors' Degrees [1] Conferred in Basic Medical Sciences, by School and Field, 1964–65

State and school	Total basic medical sciences	Anatomy [2]	Biochemistry	Biophysics	Microbiology [3]	Pathology [4]	Pharmacology	Physiology [5]
Total, all schools	**879**	**85**	**290**	**39**	**225**	**33**	**79**	**128**
Alabama: University of Alabama	1	------	------	------	------	------	------	1
Arizona: University of Arizona	5	------	2	------	3	------	------	------
California								
California Institute of Technology	3	------	2	1	------	------	------	------
Stanford University	11	1	1	5	2	------	------	2
University of California, Berkeley	32	------	11	6	11	------	------	4
University of California, Davis	31	------	6	------	3	14	1	7
University of California, Los Angeles	20	6	4	3	6	------	------	1
University of California, San Francisco	15	3	5	------	------	2	5	------
University of Southern California	5	------	2	1	1	------	------	1
Colorado:								
Colorado State University	8	------	1	------	3	------	------	4
University of Colorado	4	1	------	------	1	------	------	2
Connecticut:								
University of Connecticut	7	------	3	------	3	------	1	------
Yale University	15	1	4	3	1	------	5	1
District of Columbia:								
Catholic University of America	2	------	------	------	2	------	------	------
Georgetown University	9	------	2	------	2	2	------	3
George Washington University	7	------	2	------	2	------	1	2
Howard University	2	------	------	------	------	------	2	------
Florida:								
Florida State University	15	------	------	------	9	------	------	6
University of Florida	6	------	2	------	1	------	2	1
University of Miami	7	------	4	------	1	------	------	2
Georgia:								
Emory University	6	2	2	------	------	------	2	------
University of Georgia	2	------	------	------	2	------	------	------
Hawaii: University of Hawaii	1	------	1	------	------	------	------	------
Idaho: University of Idaho	2	------	2	------	------	------	------	------
Illinois:								
Illinois Institute of Technology	5	------	4	------	1	------	------	------
Loyola University	2	------	------	------	------	------	2	------
Northwestern University	3	------	1	------	1	1	------	------
Southern Illinois University	3	------	------	------	2	------	------	1
University of Chicago	16	1	5	2	------	1	3	4
University of Illinois	24	4	4	1	6	1	------	8
Indiana:								
Indiana University	13	------	6	------	5	------	------	2
Purdue University	11	------	11	------	------	------	------	------
Iowa:								
Iowa State University of Science and Technology	11	------	6	------	5	------	------	------
University of Iowa	10	1	4	------	------	------	2	3
Kansas:								
Kansas State University of Agriculture and Applied Science	2	------	1	------	1	------	------	------
University of Kansas	4	2	------	------	1	------	------	1
Kentucky:								
University of Kentucky	2	1	------	------	------	------	------	1
University of Louisville	6	------	------	------	1	------	3	2
Louisiana:								
Louisiana State University and Agricultural and Mechanical College	4	------	1	------	2	------	------	1
Tulane University of Louisiana	18	6	5	------	4	------	1	2
Maryland:								
Johns Hopkins University	8	3	2	3	------	------	------	------
University of Maryland	22	3	3	------	12	------	2	2
Massachusetts:								
Boston University	2	------	1	------	1	------	------	------
Brandeis University	4	------	4	------	------	------	------	------
Harvard University-Radcliffe	12	1	8	1	------	------	------	2
Tufts University	1	------	1	------	------	------	------	------
University of Massachusetts	3	------	------	------	3	------	------	------
Michigan:								
Michigan State University of Agriculture and Applied Science	21	5	6	------	5	3	------	2
University of Michigan	15	1	4	------	5	------	3	2
Wayne State University	3	2	------	------	------	------	------	1
Minnesota: University of Minnesota	38	6	11	------	7	4	5	5
Mississippi: University of Mississippi	8	1	1	------	2	------	4	------

See footnotes at end of table, p. 110.

APPENDIX 4.—NUMBER OF DOCTORS' DEGREES [1] CONFERRED IN BASIC MEDICAL SCIENCES, BY SCHOOL AND FIELD, 1964–65—Con.

State and school	Total basic medical sciences	Anatomy [2]	Biochemistry	Biophysics	Microbiology [3]	Pathology [4]	Pharmacology	Physiology [5]
Missouri:								
St. Louis University	5	------	3	------	------	------	2	------
University of Missouri	14	------	12	------	------	------	------	2
Montana: Montana State University	2	------	------	------	2	------	------	------
Nebraska: University of Nebraska	3	------	------	------	1	------	------	2
New Jersey:								
Princeton University	2	------	2	------	------	------	------	------
Rutgers, the State University	24	------	3	------	21	------	------	------
New York:								
Columbia University	11	2	5	1	------	------	2	1
Cornell University	18	1	9	------	4	1	------	3
Fordham University	4	3	------	------	------	------	------	1
New York University	6	------	------	------	------	1	------	5
Rockefeller Institute	6	------	3	2	1	------	------	------
SUNY, College of Forestry	1	------	1	------	------	------	------	------
SUNY, Downstate Medical Center	3	------	------	------	------	------	2	1
SUNY, University of Buffalo	15	1	2	2	6	------	2	2
SUNY, Upstate Medical Center	4	------	2	------	------	------	2	------
Syracuse University	6	------	------	------	6	------	------	------
University of Rochester	16	2	5	1	2	------	1	5
Union University	6	------	3	------	1	------	2	------
Yeshiva University	2	1	1	------	------	------	------	------
North Carolina:								
Duke University	13	1	8	------	2	------	------	2
University of North Carolina at Chapel Hill	16	------	7	------	4	------	------	5
University of North Carolina State at Raleigh	3	------	------	------	2	------	------	1
North Dakota: University of North Dakota	8	6	2	------	------	------	------	------
Ohio:								
Ohio State University	9	2	2	------	2	1	------	2
University of Cincinnati	2	------	------	------	2	------	------	------
Western Reserve University	8	1	3	------	2	------	2	------
Oklahoma:								
Oklahoma State University of Agriculture and Applied Science	4	------	------	------	3	------	------	1
University of Oklahoma	6	------	1	------	4	------	------	1
Oregon:								
Oregon State University	1	------	1	------	------	------	------	------
University of Oregon	2	------	2	------	------	------	------	------
Pennsylvania:								
Bryn Mawr	2	------	2	------	------	------	------	------
Hahnemann Medical College and Hospital	5	------	------	------	1	------	3	1
Jefferson Medical College	4	1	------	------	3	------	------	------
Pennsylvania State University	8	------	5	1	2	------	------	------
Philadelphia College of Pharmacy and Science	2	------	------	------	------	------	2	------
University of Pennsylvania	18	3	5	1	2	1	------	6
University of Pittsburgh	7	------	3	1	3	------	------	------
Wmn's Medical College of Pennsylvania	2	------	------	------	------	------	2	------
Tennessee:								
University of Tennessee	9	2	3	------	2	1	1	------
Vanderbilt University	9	2	5	------	------	------	1	1
Texas:								
Baylor University	4	------	1	------	1	------	------	2
Texas A. & M. University	6	------	4	------	2	------	------	------
University of Texas	12	1	1	1	9	------	------	------
Utah:								
Brigham Young Utah	1	------	------	------	1	------	------	------
University of Utah	6	1	------	------	2	------	3	------
Utah State University of Agriculture and Applied Science	2	------	------	------	1	------	------	1
Vermont: University of Vermont	2	------	1	------	------	------	------	1
Virginia:								
University of Virginia	1	------	------	------	1	------	------	------
Virginia Polytechnic Institute	5	------	4	------	1	------	------	------
Washington:								
University of Washington	20	2	12	2	2	------	2	------
Washington State University	1	------	------	------	1	------	------	------
West Virginia: West Virginia University	8	------	5	------	1	------	2	------
Wisconsin:								
Marquette University	7	------	------	------	------	------	3	4
University of Wisconsin	31	2	17	1	8	------	1	2

[1] Ph. D's, Sc. D's.
[2] Includes histology, cytology, and embryology.
[3] Includes bacteriology, virology, mycology, and parasitology.
[4] Excludes plant pathology
[5] Excludes plant physiology.

Source: National Center for Educational Statistics, Office of Education, Department of Health, Education, and Welfare.

Appendix 5.—Number of Doctors' Degrees[1] Conferred in Biosciences (Other Than Basic Medical), by School and Field, 1964–65

State and school	Total, biosciences	Biology	Botany	Entomology	Genetics	Plant pathology	Zoology	All others[2]
Total, all schools	1,049	180	202	132	86	81	239	129
Alabama:								
Auburn University	6		1	2			3	
University of Alabama	4	4						
Alaska: University of Alaska	2							2
Arizona:								
Arizona State University	2		1				1	
University of Arizona	10		2			3	5	
California:								
California Institute of Technology	1							1
Stanford University	12	12						
University of California, Berkeley	51		5	12	7	5	18	4
University of California, Davis	39		3	8	10	2	2	14
University of California, Los Angeles	25		12				13	
University of California, Riverside	4			2				2
University of California, San Diego	1							1
University of California, Santa Barbara	1	1						
University of Southern California	9	9						
Colorado:								
Colorado State University	11		4		1	1	2	3
University of Colorado	7		2				5	
Connecticut:								
University of Connecticut	1		1					
Yale University	9	9						
Delaware: University of Delaware	5	5						
District of Columbia:								
Catholic University of America	6		1	1			3	1
George Washington University	3	1	1				1	
Howard University	3						3	
Florida:								
Florida State University	4	1	1				2	
University of Florida	15	2	8	3				2
University of Miami	10							10
Georgia:								
Emory University	1	1						
University of Georgia	7		3				4	
Hawaii: University of Hawaii	11		4	2	1		4	
Idaho: University of Idaho	1		1					
Illinois:								
Illinois Institute of Technology	1	1						
Northwestern University	8	8						
Southern Illinois University	4						4	
University of Chicago	21		10				4	7
University of Illinois	23		3	7		3	10	
Indiana:								
Indiana University	8		3				5	
Purdue University	15	11		2			2	
University of Notre Dame	10	10						
Iowa:								
Iowa State University of Science and Technology	17		4	3	1	6	1	2
University of Iowa	8		5				3	
Kansas:								
Kansas State University of Agriculture and Applied Science	13		3	5	1	4		
University of Kansas	14		5	2			7	
Kentucky:								
University of Kentucky	1		1					
University of Louisville	5		1				4	
Louisiana:								
Louisiana State University and Agricultural and Mechanical College	11		1	1		7	2	
Tulane University of Louisiana	4						4	
Maryland:								
Johns Hopkins University	19				3			16
University of Maryland	12		2	4		1	3	2

See footnotes at end of table, p. 113.

APPENDIX 5.—NUMBER OF DOCTORS' DEGREES [1] CONFERRED IN BIOSCIENCES (OTHER THAN BASIC MEDICAL) BY SCHOOL AND FIELD, 1964–65—Continued

State and school	Total, biosciences	Biology	Botany	Entomology	Genetics	Plant pathology	Zoology	All others [2]
Massachusetts:								
Boston University	4	4	------	------	------	------	------	------
Brandeis University	2	2	------	------	------	------	------	------
Clark University	3	3	------	------	------	------	------	------
Harvard University-Radcliffe	14	14	------	------	------	------	------	------
Massachusetts Institute of Technology	17	8	------	------	------	------	------	9
Tufts University	1	1	------	------	------	------	------	------
University of Massachusetts	9	------	1	2	1	------	5	------
Michigan:								
Michigan State University of Agricultural and Applied Science	22	------	16	1	------	------	5	------
University of Michigan	17	------	6	------	4	------	7	------
Wayne State University	2	2	------	------	------	------	------	------
Minnesota: University of Minnesota	37	------	5	5	9	9	6	3
Mississippi:								
Mississippi State University	4	------	------	3	------	------	1	------
University of Mississippi	1	1	------	------	------	------	------	------
Missouri:								
University of Missouri	10	------	3	2	4	------	1	------
Washington University	2	------	------	------	------	------	1	1
Montana: Montana State University	6	------	------	1	4	------	1	------
Nebraska: University of Nebraska	3	------	2	------	------	------	1	------
New Hampshire: University of New Hampshire	3	------	1	------	------	------	2	------
New Jersey:								
Princeton University	3	3	------	------	------	------	------	------
Rutgers, the State University	19	------	4	8	------	2	5	------
New Mexico: University of New Mexico	2	2	------	------	------	------	------	------
New York:								
Columbia University	16	------	5	------	------	------	7	4
Cornell University	26	------	3	8	6	5	2	2
Fordham University	1	------	------	------	------	------	------	1
New York University	11	11	------	------	------	------	------	------
Rockefeller Institute	5	------	------	------	------	------	------	5
St. Bonaventure	3	3	------	------	------	------	------	------
St. Johns University	4	4	------	------	------	------	------	------
SUNY, College of Forestry	4	------	2	------	------	------	2	------
SUNY, University of Buffalo	3	3	------	------	------	------	------	------
University of Rochester	6	2	------	------	------	------	------	4
North Carolina:								
Duke University	14	------	7	------	------	------	7	------
University of North Carolina at Chapel Hill	3	------	2	------	------	------	1	------
University of North Carolina State at Raleigh	22	------	------	4	11	6	------	1
North Dakota: North Dakota State	1	------	1	------	------	------	------	------
Ohio:								
Kent State	1	1	------	------	------	------	------	------
Ohio State University	23	------	7	5	------	4	7	------
University of Cincinnati	1	------	1	------	------	------	------	------
Western Reserve University	5	5	------	------	------	------	------	------
Oklahoma:								
Oklahoma State University of Agriculture and Applied Science	18	------	1	4	6	------	7	------
University of Oklahoma	7	------	4	------	------	------	3	------
Oregon:								
Oregon State University	20	------	5	6	2	1	6	------
University of Oregon	6	6	------	------	------	------	------	------
Pennsylvania:								
Lehigh University	3	3	------	------	------	------	------	------
Pennsylvania State University	12	1	------	3	1	3	4	------
University of Pennsylvania	7	------	1	------	------	------	5	1
University of Pittsburgh	8	5	------	------	------	------	------	3
Rhode Island:								
Brown University	8	7	1	------	------	------	------	------
University of Rhode Island	7	------	------	------	------	------	------	7
South Carolina:								
Clemson University	3	------	------	1	------	2	------	------
University of South Carolina	1	1	------	------	------	------	------	------
Tennessee:								
University of Tennessee	13	------	5	------	------	------	4	4
Vanderbilt University	4	3	------	------	------	------	------	1
Texas:								
Rice University	8	8	------	------	------	------	------	------
Texas A. & M. University	13	------	------	3	2	1	4	3
University of Houston	1	1	------	------	------	------	------	------
University of Texas	16	------	10	------	------	------	6	------

See footnotes at end of table, p. 113.

APPENDIX 5.—NUMBER OF DOCTORS' DEGREES [1] CONFERRED IN BIOSCIENCES (OTHER THAN BASIC MEDICAL), BY SCHOOL AND FIELD, 1964–65—Continued

State and school	Total, biosciences	Biology	Botany	Entomology	Genetics	Plant pathology	Zoology	All others [2]
Utah:								
University of Utah	3		1				2	
Utah State University of Agriculture and Applied Science	2						2	
Vermont: University of Vermont	1		1					
Virginia:								
University of Virginia	1							1
Virginia Polytechnic Institute	4		1	3				
Washington:								
University of Washington	24		9		3		8	4
Washington State University	12		3	2	3	4		
West Virginia: West Virginia University	4					3	1	
Wisconsin:								
Marquette University	1	1						
University of Wisconsin	54		6	17	7	8	8	8
Wyoming: University of Wyoming	3						3	

[1] Ph. D.'s, Sc. D.'s.
[2] Includes ecology, nutrition, plant physiology, and all others.

Source: National Center for Educational Statistics, Office of Education, Department of Health, Education, and Welfare.