

## THE FEDERAL GOVERNMENT LOOKS AT MEDICAL RESEARCH<sup>1</sup>

NORMAN TOPPING, M.D.<sup>2</sup>

The Federal government must look at medical research from at least three viewpoints—as a “consumer” of medical research, as a “producer” of medical research and as a “source of support” for medical research.

In each role the Federal government faces an array of policy problems that are not fully resolved. As a “consumer” of medical research, for example, the Federal government purchases under contract some findings that must be kept secret in the interest of National security. I need not elaborate on the basic conflict between secrecy of research and scientific progress.

As a “producer” of medical research, the Federal government faces another set of problems. The perennial difficulties of reconciling Civil Service regulations designed for the standard administrative structure of Federal agencies to the special needs of research organizations have not been resolved. However, substantial progress was begun on this problem during the last session of Congress when the new Civil Service Classification Act was passed. In the Public Health Service we have the problem of maintaining a sound research program within institutes created by Congress to deal with specific diseases. We must prevent these institutes from becoming ingrown and from concentrating solely upon work directly related to specific diseases without due attention to fundamental problems in the medical and biological sciences.

Finally, the Federal government has become one of the major sources of support for the research programs of universities and medical schools. I should like to devote my time at today's luncheon to what seem to me to be some major questions that have emerged during the last three or four years as a result of increased Federal support of medical research. In particular, my discussion will turn around the impact of Federal medical research grants on the administrative structure of universities and medical schools, changing patterns of medical research, and some implications of the geographical distribution of these grants.

We have, first, an impression that a substantial number of institutions have not developed adequate means of handling relatively large research funds derived from sources other than endowment.

Some heads of departments and deans, for example, tell us that so much money is available for research that men devote too little time to teaching. Others say that some faculty members apply for and accept such large sums from outside sources that the university—or medical school—must give them an undue share of the school's limited space and other facilities. Finally, we are urged to change from support of research projects to support of the general research program of the institution because support of projects prevents the institution from establishing a well balanced research program.

<sup>1</sup> Presidential Address at the Annual Meeting of the American Society of Tropical Medicine, Memphis, Tennessee, November 8, 1949.

<sup>2</sup> Associate Director, National Institutes of Health.

A common thread draws these apparently unrelated comments together. They all reflect inadequate formulation or administration of a research policy for the institutions.

In the absence of a well conceived and soundly administered research policy, a number of difficulties—such as those I have outlined—appear to be traceable to the research grants of the Federal government. When an institution does not have a sound research policy, it sometimes looks as if the Federal government rather than the institution is setting major institutional policies. This can be interpreted as “control over” the institutions by the Federal government. I maintain, however, that most of these problems should be solved, as they have been solved by many medical schools and universities, not through the elimination of Federal support for medical research or demands for major changes in the research grant policies of the Federal government but through more effective research administration in the medical schools and universities.

It seems to me that whenever some factor essential to research in a university or medical school is in short supply—whether the scarce factor is space, equipment, men or funds—the question of allocation must be faced. Without a research policy, the allocation is on a hit-or-miss basis and the institution in effect abdicates its responsibility. Reluctance to “administer” research is understandable, for it will almost certainly involve saying “No” occasionally to a faculty member who could do better for himself if there were no policy. The question of freedom of research is often discussed, often with more heat than light, when decisions of this sort are made. But, failure to have and to administer effectively an institutional research policy can have consequences which the institution may later regret. One of these is to permit the Federal government, as a source of research funds, to have a large share in setting the content of the research undertaken by the institution.

This problem is, I am sure, common to all large scale undertakings. We face it in government. At the National Institutes of Health, for example, we must divide our appropriations among six constituent institutes—such as the Microbiological Institute, the National Heart Institute and the National Cancer Institute, which are comparable with the departments of universities. Rarely is any group satisfied that it receives the share of the budget to which the importance of its work and the competence of its investigators rightly entitles it.

This thorny problem of setting institutional research policies that will increase the overall effectiveness of research leads naturally to consideration of a broader question. This question is whether the traditional pattern of organization—research as an integral part of the institutional organization for teaching—can or should withstand the impact of research undertaken as a large scale activity.

In the decades before World War II, medical research was, in large part, a part-time adjunct to teaching. Formal classroom lectures and teaching and research were of necessity combined. From this historical relationship there developed a widespread impression that all types of research and all levels of teaching were at all times and under all circumstances mutually self-supporting, yet interdependent. A candid examination of medical research as it is today, and as

it appears to be developing, leads to the hypothesis that research of the highest quality—"applied" or "fundamental"—is not necessarily linked to teaching except in the narrow sense that those engaged in research—advanced students as well as investigators—learn from each other.

There are a number of indications that the traditional organization is not adequate in all institutions. Some medical schools, for example, are worried about the place of full time investigators in their permanent faculty plans. They feel that they cannot assume full and continuing responsibility for persons who do not contribute to the teaching function. It seems quite likely that this difficulty will become progressively more acute. In broad perspective, we are witnessing an expansion of the research function at a much more rapid rate than the teaching function, and the organization established primarily around the teaching function is creaking under the load.

What the adaptation to this new situation will be, no one can foretell. One development that appears quite likely is the emergence of research organizations—call them institutes, research centers, or what you will—that will be loosely allied to or divorced from the teaching structures of the institutions. This has happened over the last two decades in other research fields—particularly the physical sciences—where funds were more adequate than in medicine and related fields. Developments such as this are foreshadowed not simply by the growth but also by the changing character of a substantial proportion of medical research. Some problems can be profitably attacked only by the coordinated full time efforts of investigators in a number of fields.

The long sought integration of the physical and the biological sciences, a development that promises to be the source of major research advances over the coming years, will necessitate a wider area of collaboration among disciplines that have not as yet been adequately concentrated upon specific problems. Among these can be cited problems related to radiation in relation to biological problems and the complex biochemical and biophysical phenomena involved in studies of the endocrine system.

For these reasons, given an expanding universe of medical research over the next few years, I would anticipate the development of an extensive array of medical research institutes—some related to universities and medical schools, some allied to hospitals, others financed and operated by private foundations and others operated by government. By this, I do not mean to imply that research has no place in the structure of medical schools and universities. On the contrary, the opportunity to do research is indispensable to the maintenance of a faculty of the highest caliber. What I do mean is that research undertaken in educational institutions will probably be supplemented to an ever-increasing degree by research undertaken under other auspices.

As we look at the total medical and related research of universities and medical schools, we are impressed by the concentration of men, money and facilities in relatively few institutions and in relatively few geographical areas. We have been taken to task for not attempting to broaden the base for research by wider distribution of funds.

I can assure you, first, that the Public Health Service feels a keen sense of responsibility to do what we can to support research in regions where research has been relatively weak. We are interested not only in aiding the output of research findings in the near future, but in helping to build strong regional research centers. No one can read the history of science, including medicine, without a sharp realization that diversity of approach and a reasonable degree of iconoclasm are necessary if sterility is to be avoided. Geographical dispersion of research is one means of promoting the vigorous growth of competing points of view.

I can assure you, second, that no Federal official could long ignore this responsibility even if he wished to.

To see how the Public Health Service has dealt with this question, we found how applications for research grants and grants actually awarded were distributed by geographical region. Then we devised a measure that might be called the medical "research potential" of the Nation. This was done by finding the geographical distribution of scientists competent to conduct medical and related research, as a guide to the distribution of manpower; the distribution of approved residencies, fellowships and advanced degrees, as a guide to the distribution of facilities; and the distribution of research articles published in outstanding journals over a period of several years, as a guide to research output. These three factors were given equal weight in an "index of research potential." The index showed, for example, that 25 percent of the Nation's medical research potential is concentrated in the New England states and 9 percent in the Pacific states. We found that both applications for Public Health Service research grants and the grants awarded were distributed in virtually exact proportion to the medical research potential. Thus, 24 percent of our grants have gone to the New England states and 9 percent to the Pacific states (1). This, I hasten to point out, does not mean that we are doing a perfect job. What it does mean is that we are not promoting the concentration of research only in areas already well stocked with investigators and facilities. For example, in the Mountain States with a research potential of 1 percent, 5 percent of grants have been made.

Our efforts to further diversify the distribution of grants have met practical difficulties. As I have pointed out, we simply do not receive a large volume of applications from areas where there are few research personnel and limited research facilities. The reason for this is obvious, and has been confirmed time after time by talks with university and medical school officials. When an institution is so pressed financially that the faculty must spend full time—and more—on teaching, and all available funds must be devoted to maintenance and improvement of teaching, a substantial research program is impossible.

We have found that there are sharp limits upon the extent to which research grants alone can promote a more widespread geographical dispersion of research.

A research program can be effective only in a congenial environment. If time for research must be added to an already over-extended teaching schedule; if there is not at least a small group anxious and competent to do research; and if research is not actively encouraged by the administrative hierarchy of the school;

provision of research funds alone—from the Federal government or any other source—will not effectively stimulate research.

This had led us to the conclusion that Federal funds for general aid to medical education must supplement Federal research funds if there is to be a really substantial shift in the geographical distribution of medical research.

As you know, a law for this purpose recently passed the Senate and is now pending in the House of Representatives. It seems quite probable that this law will be enacted in the next session. If this measure is enacted, we will have the opportunity to develop a sound system of complementary general aid and specific research aid.

We in the Public Health Service have a sense of living in a period of profound change in medical research and medical education. This, rather than any set of narrow problems, is what impresses us most in our relationships with the medical schools and universities. It may be that we feel this sense of change more acutely than those connected with a single institution because we are affected, through the research grants and fellowship program, by the pressures that impinge on all medical schools and most universities.

These problems are particularly significant because they are not transitory. The growth of Federal support of medical research seems to us to be deeply rooted in economic, social and political changes that are not reversible. The rate of return on endowment, for example, is far below pre-war levels, and will probably remain at relatively low levels. The era of gigantic fortunes, the major source of large endowments in the past, is passing. These problems are, of course, common to all higher education. It seems quite likely, therefore, that Federal support of medical and related research and general support of medical and related education will set precedents of the utmost significance when the problems of Federal aid to all higher education is dealt with by Congress.

In closing, I want to stress what seems to me to be a fundamental change in the relationship between investigators and educational institutions on the one hand and the Federal government on the other. This is the development of working relationships that are closer than ever before in history. And I speak now not only of the Public Health Service but of all Federal agencies engaged in and supporting scientific research.

I am fully confident that Federal support will contribute its share to an unprecedented flowering of research if there is a free and frank interchange of views between people in government and those in universities and medical schools.

For this reason, I cannot overemphasize the contribution to formulation of public policy made by those—many of whom are in this audience—who have participated so willingly and effectively to the design and execution of this critically important experiment in the financing of research.

#### REFERENCE

- (1) REYNOLDS, FRANK W. AND PRICE, DAVID E.: Federal Support of Medical Research Through the Public Health Service, *American Scientist*, 37: 4, 578, 1949.