A National Science Foundation

Statement by William C. Foster, Under Secretary of Commerce, before the Committee on Interstate and Foreign Commerce, House of Representatives, March 7, 1947

THE PRINCIPAL DIFFERENCES BETWEEN the bills before Congress for a National Science Foundation relate to: (1) the form of administrative organization of the proposed Foundation; (2) the question of patent policy with respect to government research contracts; (3) the inclusion of the social sciences; and (4) the distribution of research funds.

Administrative Organization

The difference of opinion as to the form of administrative organization of the proposed Foundation is fundamentally between the following two principles: (1) the usual straight-line organization of Federal agencies consisting of an administrator appointed by the President with the advice and consent of the Senate and responsible to the President; and (2) a part-time board of private citizens which in turn selects a full-time administrator. In the bill which passed the Senate last year a combination of these two administrative arrangements was agreed to—a Presidentially appointed administrator supplemented by a part-time advisory board and divisional advisory committees with the right to report to the President and the Congress independently. H.R. 942 also provides for this in-between arrangement.

On the other hand, the four other bills before your Committee represent an extreme form of the part-time board arrangement. Instead of the board of 9 members in the Magnuson and Mills Bills of last year, these four bills provide for an uncompensated part-time board of 48 members appointed by the President. This large board then selects an executive committee of 9 members, which in turn chooses the director of the Foundation. The executive committee in effect exercises all the real duties and powers of the Foundation. In fact, the 48-man board seems to have no other function than to establish the executive committee and to ratify by majority vote the selection of the director of the Foundation by the executive committee.

I should like to make two observations about this wheels-within-wheels arrangement which starts with a 48-man, part-time committee.

First, if the President or the Congress were dissatisfied with the workings of the Foundation, it would be practically impossible to focus responsibility and to bring about any change in policy under this kind of arrangement. The director could hide behind the executive committee and the executive committee behind a board with 8-year terms.

Second, this 48-man board might also be construed as a bargaining device. Since the board has few functions, it could easily be "sacrificed" in a compromise with the principle of a single administrator, leaving a 9-man board which exercised all of the functions anyway. A compromise on this basis would be similar to the well-known fifty-fifty horse and rabbit stew—one horse and one rabbit.

It seems clear, then, that the practical choice boils down once more, as it did last year, to first, a part-time board of about 9 members selecting its own director, or second, an administrator appointed by the President with the advice and consent of the Senate. Or another alternative is the genuine compromise between these two positions contained in S. 1850 last year and H.R. 942 this year, which consists of an administrator plus an advisory board with direct access to the President and to the Congress. In my opinion there is no question that the basic principle of the single administrator advocated by President Truman represents the only sound public policy. The amount of influence on American scientific development which could be exercised by the Foundation, and the volume of public funds which will be allocated by the Foundation, are too great to give to a part-time body of private citizens. This is especially true if complete discretion is given to the Foundation—as in the four almost identical bills before you—to allocate research funds without regard to geographical distribution or type of research institution. We have here a situation in which a small group of men without direct responsibility to the elected representatives of the people—the President and the Congress—could control the public financial support of science outside the framework of our recognized democratic procedure of coupling responsibility with authority in government. Authority without responsibility is basically wrong in principle.

Patent Policy

On the question of patent policy all the bills before you are in agreement that no employee of the Foundation shall be permitted to profit personally by taking out private patents on discoveries arising in the course of his employment with the Foundation. This is also the policy of the Department of Commerce and of most government agencies at the present time with respect to employee patents.

On the other hand, when it comes to applying the same principle to research contractors using government

funds, the bills diverge. The four similar bills state that the Foundation shall "protect the public interest and the equities of the individuals or organizations" with which contracts are made without in any way defining the public interest. On the other hand, H.R. 942 provides that discoveries, including patented discoveries, arising in the course of all Federally-financed research shall be available to all, except that research contractors may in exceptional cases retain patent rights in fields where the contractor has made substantial previous investments of his own funds. It should be noted that H.R. 942 (and S. 1850 which passed the Senate last year) extends the public dedication policy to *all* Federally-financed research and not merely to the research financed by the National Science Foundation.

The question of patent policy is a separable question; it affects all government departments and not only the proposed Foundation. It is the subject of a very detailed and careful study by the Attorney General which has recently been submitted to the President for consideration. It is also a subject of study by the President's Patent Committee. Therefore, I suggest that the question of broad patent policy on research contracts be omitted from this bill so as to expedite its consideration and passage; and that government-wide patent policy be considered as a separate problem.

Social Sciences

There was, as you know, a considerable difference of opinion in the hearings last year as to whether the social sciences should be included in the National Science Foundation. Because of the similarity of terms, social science has carried an unfortunate connotation of social welfare activities or of a vague impracticability. Actually, social science, under more specific terms such as statistics, business analysis, and industrial psychology and 'management,' is an indispensable tool in the operation of any modern large-scale private enterprise and in the operation of Federal, State, and local governments. The Congress itself has acted on this understanding in some of the provisions of the Legislative Reorganization Act of 1946, especially with respect to providing professional staffs to the standing committees.

Social science, however much it may be misunderstood when referred to in that general term, is a part of our everyday life in the 20th Century. We need more and better knowledge about our society if we are to be successful in dealing with some of the complex and difficult problems which we are facing today and in the years ahead. As to the kind of research to be fostered by the Foundation in this field, the Congress will, of course, be able to guide and control this matter through the review of annual appropriations, as it has done in connection with the extensive applied social science activities which have long been part of the operations of other Federal departments and agencies.

Developments in the natural sciences are far in advance of mankind's ability to control the physical forces which they have unleashed—such as atomic energy. As an engineer who has witnessed the impact of technological changes on our society, I am particularly aware of the importance of developing the sciences that deal with man and his institutions. In fact, the future of our society and of man himself may depend on whether we gain sufficient social knowledge in time to control the powerful forces of nature as they have come to be applied. A National Science Foundation which would provide only for the natural sciences would place the social sciences at new and further disadvantages in competing for the best young talent of the country in institutions of higher learning and in research.

Distribution of Research Funds

H.R. 942 contains a formula under which 25 per cent of the research funds (except for national defense research) of the Foundation would be allocated to land-grant colleges and state universities—15 per cent in proportion to the population of each state and 10 per cent in equal shares to all states. However, no individual contract can be made unless it is consistent with the general program and standards of the Foundation. Another 25 per cent of the research funds would be earmarked for nonprofit institutions. The other four bills provide no such guide to the Foundation in the distribution of research funds.

Under practically all legislation providing Federal aid to states there are rather rigid formulae for the distribution of funds—formulae based upon population, area, matching of funds, and various other objective factors. Very little discretion is left to the administrative agencies. The research funds to be allocated under this legislation are not, of course, strictly comparable with Federal aid to the states. On the other hand, some of the same considerations are applicable. Scientific ability is widely enough distributed among the various areas of the United States so that one-quarter of the Foundation's research funds can be expended according to a geographical and population formula without much danger of lowering the quality of research. At the same time such a provision provides some safeguard against the possibility of unnecessary concentration of funds in a few favored institutions. Similarly, it is only proper that the Congress provide some guide to the Foundation on the amount of funds to be allocated to nonprofit institutions, which have hitherto carried the burden of the basic scientific research with which this legislation is concerned. I would urge that your Committee give serious consideration to incorporating into the bill certain minimum standards for the allocation of funds, and yet leave sufficient flexibility so that the quality of research is maintained at the highest level.

Other Provisions of the Bills

I believe that the four points just discussed cover the most important variations in the bills which you are considering. In most other major respects the bills are substantially the same. I am glad to note, for example, that all the bills provide for the coordination of the scientific activities of the Federal Government through a standing Interdepartmental Committee on Science, and that the existing scientific agencies of the Government may receive research contracts from the Foundation as a supplement to their regular activities and appropriations, and not in substitution therefor. These two provisions are of great interest to the Department of Commerce, which includes several of the important scientific agencies in the Government, such as the National Bureau of Standards, Weather Bureau, and Coast and Geodetic Survey in the natural sciences, and the Census Bureau and Bureau of Foreign and Domestic Commerce in the social sciences.

In conclusion, let me say that the general objectives of this legislation have the fullest support and endorsement of the Secretary of Commerce, for whom I am speaking, and of the President. (I am, of course, in no sense committing the President on all the specific points I am raising.) On the other hand, there is serious question as to whether the Foundation could operate properly and in the public interest under some of the forms of administrative organization which have been proposed. The combination of the best features of the single administrator and an advisory board which were worked out last year, and which are incorporated in H.R. 942, seem to be the desirable solution of this problem. With respect to the social sciences and the allocation of research funds, the provisions of H.R. 942 also appear to be preferred to those of the other bills. Finally, it is my judgment that the patent problem is a separable issue and that government-wide patent policy should be considered independently of the Science Foundation Bill.

It has become increasingly recognized that widespread support of science is essential to technological advance, economic progress, and higher standards of living and to our national security. There is no question but that the public financial support of science which you are considering will in the long run represent a small expenditure compared with the great gains which experience has shown we may confidently expect.

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Statement by James B. Conant, president of Harvard University, before the Committee on Interstate and Foreign Commerce, House of Representatives, March 7, 1947

I APPEAR BEFORE YOU TO URGE FAVORABLE action on identical bills H.R. 1815, 1830, 1834, and 2027, which are concerned with a National Science Foundation. I wish to address myself at the outset to those sections which empower the Foundation to grant scholarships and fellowships. For to me these are by far the most important parts of the bills. I make this statement advisedly, for there is no use considering ways and means of spending money on research unless first-rate men are available to do the work.

In all the discussion about research that goes on in these days, an obvious fact is sometimes overlooked, namely, that it is men that count. And today we do not have the scientific man power requisite for the job that lies ahead. The bottleneck of our scientific advance is essentially a man power shortage, and unless something is done about it, the bottleneck will be more constricted a decade hence. Now let no one imagine that, like some of the man power shortages in the war, this can be cured by mobilizing and training for a short time the first people who come to hand. Scientific and technical advances depend on quality as well as on quantity or, to put it another way, on the quantity of exceptional men. These men have to be located when they are young and then given a long and expensive scientific education. If the proposals before you become law and Congress appropriates the money, we will see a flowering of scientific work in this country the like of which the world has never seen before. For only in this Nation, where universal education reaches to the high school level, is it possible to locate the hidden reservoir of talent which, if tapped, can enrich our life and that of all mankind.

The bill before you provides for a long-term plan. The measures proposed would have been desirable even if there had been no war and no consequent deficit in our scientific and technical man power. To the extent that we fail to cure this deficit in the next few years by proper governmental action, to that extent a Federally-supported scholarship and fellowship program is even more essential.

The arguments in favor of Congress providing for such a program and making adequate annual appropriations can be summarized as follows:

(1) The welfare of a free society in an industrial age depends on a continuous advance of science and the application of the new knowledge to useful ends.