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SCIENTIFIC RESEARCH BILLS BEFORE THE UNITED STATES SENATE

IN the October 12 issue of SCIENCE, the hearings on the science Bills currently before the Senate were briefly described, but scientists who have not had access to the Senate's Subcommittee Print entitled "Legislative Proposals for the Promotion of Science" and to the Vannevar Bush report entitled "Science, the Endless Frontier," may not have full comprehension of the scope of the proposed legislation or of all the issues involved. For this reason, and in response to specific requests, the American Association for the Advancement of Science presents, with some editorial changes, a memorandum which was prepared for the biologists and agriculturists.

HOWARD A. MEYERHOFF

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

MEMORANDUM CONCERNING THE SCIENTIFIC RESEARCH BILLS NOW BEFORE THE UNITED STATES SENATE

A discussion of the provisions of the five Bills now before the Senate concerning federal support of science is of immediate interest and value partly because the situation is complicated by the varied provisions of the different Bills, and partly because the whole situation is being carefully studied by the large staff of the Senate Subcommittee on War Mobilization and comprehensive amendments are likely.

It is evident that the Senators interested are anxious to promote the fullest discussion of the measures and would welcome any comments which scientists may care to make. All letters should be sent to both Senator Magnuson and Senator Kilgore at the Senate

Office Building in Washington. The writer should be careful to identify himself by giving his credentials in the way of positions of honor and trust that he holds or has held.

I. *The Legislative Status of Science Bills*

Number	S.1297	S.1285	S.1248	S.825	H.R.3440
Sponsors	Sen. Kilgore, Pepper, Johnson	Sen. Magnuson	Sen. Fulbright	Sen. Byrd	Mr. May
Referred to:	Military Affairs Committee	Commerce Committee	Commerce Committee	Naval Affairs Committee	Naval Affairs Committee and Military Affairs Committee
Present Status:	Referred to Subcommittee on War Mobilization headed by Sen. Kilgore	Referred to Subcommittee headed by Sen. Magnuson	Referred to Subcommittee headed by Sen. Pepper	Reported by Committee July 28, 1945	Passed by H.R. No Senate action as yet

II. *The Purposes of the Bills:*

The *May Bill* (H.R.3440) authorized the National Academy of Sciences to set up a National Defense Board by agreement with the War and Navy Departments. The Bill is solely concerned with military research.

The *Byrd Bill* (S.825) sets up a Research Board for National Security as an independent agency.

The *Fulbright Bill* (S.1248) sets up within the Commerce Department a Bureau of Scientific Research to promote and develop new industrial processes and products.

The *Magnuson Bill* (S.1285) established a National Research Foundation to promote a national policy for scientific research and education, and authorizes support of research relating to national defense and the basic sciences.

The *Kilgore-Pepper-Johnson Bill* (S.1297) establishes a National Science Foundation to support research relative to national defense, medicine and the basic sciences. The Bill provides for the support of such research in non-governmental laboratories, and makes provision for the integration of the over all program of Government financed research.

III. *Joint Hearings on the Bills:*

Three of the above Bills are in essential agreement as to basic aims. Both the Magnuson and Kilgore Bills provide for establishing a Foundation to support research in fundamental and applied sciences, and differ only in the detail of procedures and organization proposed to carry out this aim. The agency proposed by the Fulbright Bill is essentially complimentary to the Foundation.

Senators Kilgore, Magnuson and Fulbright have agreed to hold joint hearings on these several Bills, so that the various aspects of the problem of federal support of research may be fully explored. The hearings opened on October 8, 1945, and will continue until November 2. The hearings will cover all aspects of the problem including the basic sciences, applications in industry, medicine and national defense, the publication and dissemination of information, and scholarships and fellowships for science students.

The hearings have been organized according to subject matter rather than around each of the three bills under consideration. The bills should not be regarded as final insofar as their various detailed provisions are concerned. It is quite likely that they will be altered in the light of the testimony brought forward at the hearings. In fact, a number of revisions of S.1297, based on discussion with various research organizations, are now contemplated; these include:

(1) a provision to protect the Foundation from partisan political pressure;
(2) provision for a Division of Basic Sciences within the Foundation;
(3) provision for the support of long-term research projects;
(4) modification of the patent section to permit the retention of patent rights where a patentable idea produced under a Foundation contract results primarily from privately financed research;
(5) provisions protecting the independence of government laboratories.

Hence, it is anticipated that the hearings will result in the integration of the three legislative proposals in such a manner as to provide the best feasible solution to the problem of federal support of scientific research. This may well result in a joint Kilgore-Magnuson Bill which will include those provisions which are shown by testimony to be most advisable.

The importance of these hearings, both for scientists and the nation, is very clear. Federal support of research holds the promise of new and rapid advances in all fields of science. The problem before us now is

to provide for this support in such a way as to meet the needs both of Science and the National Welfare.

IV. *Basic Issues Involved in the Two Major Bills:*

Because the Kilgore and Magnuson Bills are of major concern to scientists and scientific societies as a whole, there follows a comparison of the two Bills with respect to various major provisions. It should be noted that this comparison refers to the Bills as originally presented and that the Kilgore Bill has already been revised with regard to certain provisions. The final Bill is likely to combine the best features of both S.1285 and S.1297, plus changes prompted by testimony submitted at the hearings.

The Kilgore and Magnuson Bills are in essential agreement concerning the necessity for substantial Federal support of fundamental research in basic sciences and in two fields of Applied Research closely related to the National Welfare: National Defense, and Research in the Medical Sciences. They both recognize the importance of training future leaders in science, and both sponsor a program of federally financed scholarships and fellowships. Likewise they agree on the importance of prompt and full dissemination of scientific findings as a means of promoting the full development of science.

Major Areas of Disagreement

On certain other fundamental issues, however, there are basic differences in philosophy and point of view. The role that a National Foundation will play in American science and in determining the manner in which scientific developments are used in effecting national welfare will depend largely upon the resolution of these issues in the forthcoming legislation. We shall discuss these controversial issues, one at a time, and attempt to indicate the line of reasoning used by those who support the divergent points of view.

1. *Scope and Purpose*

The basic question, assuming that a National Foundation is established, is its relationship to the present structure of the Federal Government and the degree to which the work of a Foundation should be coordinated with other Federally supported research conducted in Government departments and bureaus. The extreme points of view here are:

(a) The creation of a new Government department with a head of Cabinet rank, responsible for the administration of all Government-sponsored research regardless of where conducted.

(b) The creation of an entirely independent agency, charged solely with the administration of Federally financed research in educational institutions and private laboratories, but with no functional relationship to any existent department or bureau.

Obviously neither of the above extreme situations is desirable, nor do either of the two major Bills support either of these extreme positions. The Bills do differ, however, with respect to this basic issue as follows:

The Kilgore Bill provides for support of research in non-governmental institutions (universities); in addition, the Foundation is empowered to make similar contracts with Government laboratories. Finally, the National Foundation is intended to coordinate and integrate all Government-supported research. However, this support should be regarded as supplementing rather than superseding, curtailing or limiting any of the functions or activities of existing Governmental agencies now authorized to engage in scientific research and development. The Kilgore Bill does not authorize the Foundation to exercise any supervisory direction or regulative power over the functions of such agencies or over university or private laboratories. At the same time, however, the Kilgore Bill directs the Foundation to survey continuously all Government-financed research with a view of maintaining a balanced program of research and securing the maximal return on the federal funds used for research purposes.

The Magnuson Bill leans in the other direction. It would direct the Foundation "to promote a National policy for scientific research and scientific education," and "to correlate the Foundation's programs with those undertaken by public and private research groups" but, with the exception of its Division of National Defense, does not provide for any specific tie-in with any existent Government department or agency. Proponents of this Bill argue that science and the public interest will be best served by constituting the Foundation as an independent agency supported by the Government but without functional relationship to any other Government agency.

2. *Control*

Who should control the Activities of the Foundation and be responsible for its program? Again there are two basically different points of view directly related to the divergent philosophy discussed (under 1) above:

(a) Power to be vested in a Director of the Foundation, appointed by the President and solely responsible to him, with provision for an advisory staff composed of government officials, ex-officio, and public members appointed by the President.

(b) Powers vested in a board of public members who serve without compensation, appointed by the President, and responsible to him. Under this system of control, the Board would select a Director of the Foundation to serve as the principal executive officer under the supervision of the Board.

Which of the above types of organization and con-

trol is likely to be in the best public interest? Some argue that a single director can be made much more responsible than a public board and that he is less susceptible to the pressure which various groups would apply in the hope of securing Federal support for special types of projects. This argument furthermore holds that the head of a Government agency such as a Foundation should be responsible directly to the President and not to an intermediate Board of public officials. And since it is a Government agency, the adherents of this position believe that the advisory board should include as ex-officio members Government officials (or their designees) currently responsible for other programs of Government research.

Proponents of alternative (b) above contend that a Science Foundation is a special type of Government agency and as such should be controlled by a Board of public members chosen for their capability but not serving as employees of the Federal Government. This group argues that better administration of scientific research would follow if control is vested in such a board composed of non-Government employees who, they contend, would be more sensitive to the needs of Science.

All those who have given serious thought to the matter of organization and control agree that this problem is of crucial importance, but unfortunately they do not agree on the solution to it. Since the Foundation will be responsible for the distribution of large sums of Government money, it is obvious that pressure groups may seek to divert funds to the type of institution or research in which the groups are most interested. Certainly it is desirable that the Foundation be in the best possible position to withstand such pressure and to plan a program so balanced as to promise the greatest return for the taxpayers' money. One group argues that this will most likely result if administrated by a group of "career scientists who devote their lives to administering research in the public interest." Opponents of this point of view argue that the interests of Science and of the public are not likely to be served by "bureaucrats" but by public representatives who are not Government officials. At this point, the other side suggests that uncompensated members of such a Board would perforce have prior loyalties and, regardless of the composition of the Board, it might not fairly represent all sciences, all types of Institutions, and all sections of the country.

Alternative (a) above is the type of control provided in the Kilgore Bill; alternative (b) is that provided in the Magnuson Bill.

3. *Utilization of Research Findings*

The third and last major issue involved in these science Bills is the question of who should profit economically from such commercially exploitable inventions as may result from Federal-supported research. Again let us note the two possible extreme points of view.

(a) All inventions and discoveries resulting from Government-financed research are to become the property of the United States and to be freely dedicated to the public.

(b) All inventions and discoveries resulting from research sponsored by the Government are to remain the property of the individual inventor, who may in turn dispose of the patent rights in any way he desires.

A current survey of the bureaus and departments now engaged in Government-sponsored research reveals a complete lack of any uniform policy with respect to the assignment of patents. In practically all bureaus, the Government is given a "shop-right"; *i.e.,* the right of royalty-free Government manufacture; but provisions concerning the commercial rights associated with the inventions are extremely variable. In some Government bureaus, it is required that all patents be assigned to the department for free public use, while in other bureaus Government employees retain all commercial rights of patents assigned to them.

Present practice in most commercial organizations requires the assignment of patents to the organization employing the inventor. In most cases the company pays a small flat fee for the patent, but in a few cases, the inventor is allowed a certain royalty. University practice with respect to patents is extremely variable, ranging all the way between the two possible extremes.

Those who lean to alternative (a) above contend that, if public funds are to be spent for research, public interest demands that all the results of the research be made freely available for public use. The proponents of this view point out that most research discoveries do not lend themselves to commercial exploitation and are therefore not patentable. This being the case, they argue that anything other than the free use of all research findings would tend to encourage research talent to concentrate in the areas likely to lead to patentable discoveries with the resultant danger that other equally important areas of scientific endeavor would be neglected.

Those who tend toward alternative (b) argue that permitting the individual scientist to retain patent rights to his inventions constitutes an important motivation for good men to devote their energies to science, and hence that the removal of this reward would result in many able persons or groups refusing to accept Government support for their research.

On the other hand, some scientists argue that permitting the scientist or the research organization to profit from research activities is likely to have certain

untoward effects on the dissemination of scientific data. For example, research work done with the ultimate goal of a patent in mind will tend to be kept apart from the general fund of scientific data, thereby limiting free exchange and dissemination of information.

An intermediate and widely held point of view with respect to the patent issue is that the commercial rights of patents growing out of Government research should accrue, not to the individual inventor, but to the commercial research organization or university by which he is employed. Commercial proponents of this view argue that the salaries paid to scientists employed by their organizations are sufficiently generous to include a financial reward for any probable inventions made by their employees. University spokesmen for this view contend that, in the face of declining financial income from private philanthropy, universities must establish a fund of income-producing patents to support future university research.

Opponents of this intermediary point of view answer the commercial argument as follows: since private industry claims the rights on all inventions growing out of research which it supports, logical consistency demands that the Government claim for the taxpayer the rights to all inventions growing out of research supported by public funds. To the university proponents of this intermediary view, they would reply that, aside from the propriety of using public funds to develop university-owned patents, one of the primary purposes of the Foundation is to provide generous financial support for university research; hence, universities need not worry about accumulating income-producing patents.

The patent issue has many other interesting ramifications. There is, for instance, the ethical question involved in patenting, and thus possibly restricting, the utilization of medical discoveries essential to the promotion of national health. There is also the question of whether a too rigid policy of full and free publication of the results of Government-financed research would result in commercial organizations refusing to accept research and development contracts essential to national defense.

Thus it will be seen that the patent issue is far from clear cut. Many individuals and organizations take strong positions on this issue, but a great many divergent points of view are involved. In general, the larger commercial organizations are strongly behind the position that patent rights for discoveries made by the employee should accrue to their organizations. They are, however, not too happy at the thought that the commercial rights to discoveries made by Government employees may be assigned to their competitors. Small business, on the other hand, because they are unable to support large research organizations, are equally anxious to see all patent rights made freely available on a non-exclusive license basis.

The patent policy of the Kilgore Bill is essentially that of alternative (a) above; *i.e.*, the assignment of all patents resulting from Government-sponsored research to the public. The Magnuson Bill, on the other hand, contains no specific provision regarding patent policy for inventions growing out of Federally sponsored research but leaves the Foundation, like other Government agencies, with the power to negotiate patent arrangements with research contractors as it sees fit.

Minor Issues Involved in the Bills

1. *Use of Existing Research Facilities*

The Kilgore Bill directs the Foundation to use existing facilities of Federal, State, and local government, educational institutions, research foundations and private industrial organizations, and specifies that at least 50 per cent. of the Foundation's funds is to be spent through contracts with nonprofit educational institutions and research institutions. The Magnuson Bill, on the other hand, authorizes the funds to support scientific research, but does not specify the type of facilities to be used, or any limitation on the distribution of funds.

2. *Emphasis on Special Fields of Research*

Both Bills provide for Divisions or Committees on the National Defense and Medical Research. The Kilgore Bill provides that a minimum of 20 per cent. of appropriated funds must be spent in each of these two fields. The Magnuson Bill makes no specific division of distribution of funds for special fields of research.

The Kilgore Bill authorizes the Foundation to permit any research that is in the national interest, including, in addition to National Defense and Medical Research, research in basic science, national resources, methods and processes beneficial to small business, and peacetime uses of wartime facilities. The only additional type of research specifically provided for in the Magnuson Bill is the Division of Physical Sciences "for research in the mathematical and physical sciences." Biological Sciences under this Bill are included under the Division of Medical Research. Administratively, both Bills authorize the Foundation to set up such additional divisions or research committees as may be needed within the provisions of the acts establishing them.

3. *National Science Reserve*

Although both Bills provide for renewable scholarships and fellowships, the Magnuson Bill provides that all recipients of such grants be enrolled in a National

Science Reserve and available for call by the Government for scientific and technical work in time of national emergency. The Kilgore Bill contains no provision for the formal organization of such a reserve.

4. *Appropriations*

Both Bills authorize "such sums as may be necessary," but the Magnuson Bill provides "that the unobligated appropriations are to remain available for four years following the expiration of the fiscal year in which appropriated."

V. *Conclusion*

Revised prints of both S.1285 and S.1297 have narrowed the differences between the two original Bills; but as stated by Senator Kilgore in opening the hearings, full and free discussion of all issues is desirable and necessary to achieve the best legislation. This is the time to introduce changes and to effect improvements. Scientists should make the most of the next two or three weeks to formulate views and to express them.

OBITUARY

HUGH HAMPTON YOUNG
1870–1945

AN appreciation of the life and work of Dr. Hugh Hampton Young can only be expressed here in part, otherwise it would involve the coverage of a prodigious amount of data, for the man manifested no apparent limits to his interests, ambitions and accomplishments.

Dr. Young, the only child of General William Hugh Young and Frances Kemper Young, was born on September 18, 1870, in San Antonio, Texas. There, he attended San Antonio Academy and later Staunton Academy in Virginia. At the University of Virginia, he won a $500 scholarship, and from this institution he received his bachelor's and master's degrees, both in 1893, and doctor of medicine in 1894.

The following year was spent in graduate work at the Johns Hopkins Hospital and Medical School. He became one of the members of a group of distinguished and internationally known physicians who were connected with the development and growth of these two great institutions. Among his famous colleagues were Sir William Osler, Dr. William Henry Welch, Dr. Howard Atwood Kelly and Dr. William Stewart Halsted. Dr. Halsted assigned the task of developing the Department of Genito-urinary Diseases to Dr. Young, who from then on devoted his life to the advancement of this specialty.

He became the friend of presidents, royalty and prominent citizens locally, and in many states and lands. Among his patients were President Wilson, Senator Borah of Idaho, Manuel Luis Quezon (recently deceased President of the Philippine Islands), and a host of others. One of his most renowned friends was "Diamond Jim" Brady, on whom Dr. Young performed an operation on the prostate gland in 1912. As a result, he became a very grateful patient, donating generously to the foundation that bears his name, The James Buchanan Brady Urological Institute.

Dr. Young had a keen interest in civic affairs, and was an active member of many organizations such as the State Mental Hygiene Board, the War Memorial in Baltimore, the Baltimore Museum of Art and the Aviation Commission. As president of the Lyric Theatre from 1919–1945, he practically maintained it for the entertainment and the welfare of the people of the City of Baltimore—one of his most outstanding services to that community.

In 1901, he married Miss Bessy Mason Colston, of Catonsville, Maryland. They had one son and three daughters. At the age of forty-eight years, Mrs. Young died of septicemia (*Streptococcus viridans*). This was a crushing blow to Dr. Young, who had devoted so much effort in an attempt to find a cure for this type of illness through the use of "mercurochrome" and other forms of intravenous chemotherapy.

Upon the entry of the United States into World War I, he sailed to France with General John J. Pershing, who later appointed him Director of the Division of Urology for the American Expeditionary Force. He lowered the rate of venereal diseases far below the pre-war levels. For his accomplishments, he was promoted to the rank of Colonel, and later received the Distinguished Service Medal from Secretary of War Newton D. Baker.

His interests were ever centered around the development of urology. He was a regular attendant at urological meetings in the United States and abroad. He was president of the American Urological Association in 1909. Largely through his efforts, the *Journal of Urology* was founded in 1917. He served well in the capacity of editor-in-chief of this publication to the time of his death, making this journal one of the leading publications of its kind. His scientific achievements included the improvement of the operation of perineal prostatectomy, for which he skilfully devised special instruments, his radical operation for cancer of the prostate gland, the improvement of the cystoscope, the introduction of the Punch instrument, and an instrument for the placing of radium directly upon certain types of bladder neoplasms.