clearinghouse for the dissemination of technical information obtained from foreign and domestic sources of value to industry, with special emphasis on assistance to small business with limited technical facilities; (2) cooperative research through utilization of commercial laboratories, and public and institutional research facilities, partially financed by industry, dealing with specific technical problems of an industrywide nature when requested by representatives of such industry; and (3) the filing of inventions as a matter of record, the collection and evaluation of military inventions for the armed services, and general advice and assistance to inventors.

Practically all who appeared before the committee were in general accord with that part of the bill having to do with dissemination of information. The opposition was primarily centered on the section providing for assistance to inventors, through the evaluation of their ideas and the technical services provided to assist them in properly marketing their inventions and to the provisions in regard to research and experimentation. The committee considered these objections to be well founded, and has, accordingly, eliminated those sections from the bill.

In summary, the committee said:

It is the opinion of this committee that such service will result in an extremely valuable means of utilizing available technology from military and other Federal basic research and development, by encouraging adaptation of techniques and processes having industrial value resulting from the hundreds of millions of dollars currently being appropriated by the Congress for such research. Without this bill, we will be paying billions for military research, and losing the opportunity for widespread peace-time, commercial applications.

d. Debates in Congress

Senator Ferguson spoke against the bill on July 23, 1947 (Congressional Record, pp. 9791–9792), saying it would merely create another bureau; that the Patent Office and the Library of Congress were performing the same task adequately. No further action was taken n the 80th Congress.

3. S. 868, FEBRUARY 8, 1949 (MR. JOHNSON, OF COLORADO)—81ST CONGRESS

a. Provisions

Identical to amended bill S. 493.

b. Action, Senate

The Senate Committee on Interstate and Foreign Commerce reported out S. 868 (S. Rept. 675) on July 14, 1949, during the 1st session of the 81st Congress.

Mr. Johnson, by way of explanation, said S. 868 would (1) establish a clearinghouse in the Commerce Department for the dissemination

budget for the Office of Technical Services and would charge fees which would defray cost of additional functions.

He presented a study on the relationship of the Fulbright-Aiken bill (S. 493) to existing functions of the Department of Commerce, and added:

> The Department feels that passage of the bill is imperative to enable it to keep its business services up to the needs of the postwar age, and to provide guidance in the reorganization of its technical services that will be required with the expiration of strictly temporary functions, such as the collection of technical data from Germany, in the coming fiscal year.

He described how the bill would aid inventors, especially in obtaining legal protection from the time of conception of a new process. Where private research was lagging, the Secretary could initiate such research on his own initiative, but this would be done only where private enterprise was unlikely to undertake the research.

Mr. Green also warned:

> Fundamental matters, such as the role of the commercial laboratory in perfecting an invention, or the necessity for complete disclosure to and confidence in one's patent attorney, will be valuable. However, attempts to forecast the market value of an invention or similar services should be scrupulously avoided.

(3) In oral testimony, *Senator J. William Fulbright* (pp. 37–52) explained the differences between the bills to establish the National Science Foundation and his bill (S. 493). The National Science Foundation, he pointed out, was designed for basic research, whereas his bill related to applied research.

He felt that the bill would help to prevent monopoly, and emphasized that all our business should not be concentrated in a few corporations since this would eventually lead to Government control. He added that the Office should be directed along lines which would strengthen the competitive system and discourage monopolies.

He also urged the need for an agency to serve inventors. The Patent Office does not offer service until an idea is reduced to practice; the Office of Technical Information, on the other hand, would enable an inventor to register the conception of an idea so that the date on which he conceived the idea would be made a matter of record which could be admissible as evidence. Commercial evaluation of an inventor's idea would be provided. This information would be supplied to anyone, not only inventors and small businessmen, but to large business organizations and Government units. The service here contemplated would not compete with patent attorneys and industrial engineers.

He described how agricultural experiment stations had benefited farmers.

(4) *Edward U. Condon*, Director of the National Bureau of Standards (pp. 54–57), said that some sections of the bill were of value, others not.

> I personally do not see as clear a need for the parts of the bill which have to do with providing public records of invention and providing inventors with preliminary reports on them as described in section 4.

ment of an astronomical observatory which would publish its observations and a nautical almanac (sec. 6).

No action was taken on either bill.

3. H.R. 1, MARCH 5, 1840 (MR. ADAMS)—26TH CONGRESS

H.R. 1 differed from H.R. 1160 (25th Cong.) in that it provided for additional trustees and established a board of visitors for inspection of the institution.

The report on H.R. 1 [54] opposed using the fund to establish an educational institution, stating that the Government should not compete with existing private institutes, that there was already a college in Washington, and that the States should govern the teaching of children (p. 16). The committee felt that the fund should not be limited to the establishment of an observatory, but that an observatory was a good beginning (p. 18). The House of Representatives took no action on H.R. 1.

4. H.R. 386, REPORTED APRIL 12, 1842 (MR. ADAMS)—27TH CONGRESS

H.R. 386, which was almost identical to H.R. 1 (26th Cong.), contained additional sections providing for equipment and a library for the observatory. It differed from the bills above as to appointment of trustees.

Although H.R. 386 was reported from the select committee,[55] no action was taken on it.

5. S. 245, FEBRUARY 11, 1841 (MR. LINN)—26TH CONGRESS

Section 1 of S. 245 provided for the appointment of trustees, while section 3 stated that the National Institute of Washington would nominate certain officers of the institution and would exercise general supervisory power. Section 4 read:

> The buildings for said institution shall be erected thereon, (on the Mall) and in which shall be preserved the philosophical instruments, apparatus and collections, necessary to promote the objects of the institution. And all collections of works of art and of natural history, owned by the United States, not otherwise assigned, shall be deposited in said buildings. * * *"

On February 17, 1841, S. 245 was reported from the Committee on the Library by Senator William C. Preston, but no further action was taken.

6. S. 259, REPORTED FEBRUARY 17, 1841 (MR. PRESTON)—26TH CONGRESS; S. 224, REPORTED APRIL 11, 1842 (MR. PRESTON)—27TH CONGRESS

S. 259 and S. 224 gave the National Institute of Washington even greater power over the Smithsonian Institution than was provided in S. 245 (26th Cong.). The National Institute was to elect the Smithsonian's officers (sec. 1), and its superintendent was to govern the institution (sec. 2). Section 4 provided for the assignment of Government collections to the Smithsonian Institution.

[54] Smithsonian bequest, 26th Cong., Report 277 (1840).
[55] Smithsonian bequest, 27th Cong., Report 587 (1842).

(14) *R. J. Dearborn*, chairman, patents committee of the National Association of Manufacturers (pp. 107–109), asserted that commercialization was not a job for Government:

> * * * if the Government were to assist the inventor and carry the development only part way, such as might be represented by the building of a model or a tryout of the idea, the inventor would be left in an impossible position to obtain capital to commercialize his invention if the U.S. Government owned a half interest in it and if he was required to grant nonexclusive licenses to any who desired to acquire the license.

He was against all the patent provisions of H.R. 1248.

(15) *Vannevar Bush*, Director, Office of Scientific Research and Development (pp. 108–109), stated:

> In regard to the proposal in S. 1248 that the Government establish some administrative mechanism for obtaining private exploitation of worthy inventions, I recommend considerable caution in acting. This would be a tremendous administrative undertaking. Before embarking on it, I would urge that some detailed effort be made to assess the experience of those private, nonprofit organizations which have attempted the same thing. Is it a fruitful field for Government participation? Would the administrative burden be too onerous? Is there a need in certain areas for Government assistance in exploiting new inventions? By what mechanism and under what conditions can that assistance be rendered best? Other questions of importance will also occur to you for inquiry.

He emphasized that the program should avoid conflict with the National Science Foundation, and maintained that the Government could help in other ways than through full-scale legislation, e.g., by improvement in Government information services on technical matters, by adjustments in our tax laws to allow deductions for research and development expenses, and by strengthening the patent system.

(16) *Casper W. Ooms*, Commissioner of Patents (pp. 110–112), believed that the bill would fill a real need in our society and pay large dividends. He suggested improvements in the patent provisions.

c. Report and amendments

The Senate Committee on Commerce favorably reported the bill, with amendments, on January 29, 1946 (S. Rept. 908).

The report stated that the primary purpose of the bill was to coordinate the Government's technological research facilities and information and make them readily available to business. The second important purpose was to afford facilities to independent inventors for evaluation of their inventions. It also provided for wider use of public-controlled patents in private business.

Examples given to point out the benefits of this bill were (*a*) a veteran wanting to start a small manufacturing business could have access to the technological clearinghouse to find out what new products or devices were available for him to produce; and (*b*) if he invented a

Ethnology, the Canal Zone Biological Area, the Freer Gallery of Art, the International Exchange Service, the National Air Museum, the National Collection of Fine Arts, the National Gallery of Art, the National Zoological Park, and the United States National Museum. Legislation relating to the establishment of these branches is considered below.

a. General expansion

The collections of the Smithsonian Institution were increased by the act of March 3, 1879, which provided:

> All collections of rocks, minerals, soils, fossils, and objects of natural history, archaeology, and ethnology, made by the Coast and Geodetic Survey, the Geological Survey, or by any other parties for the Government of the United States, when no longer needed for investigations in progress shall be deposited in the National Museum.

The act of April 10, 1928, made provision for the cooperation of the Smithsonian Institution in ethnological research. Section 2 read in part:

> That at such time as the Smithsonian Institution is satisfied that any State, educational institution, or scientific organization in any of the United States is prepared to contribute to such investigation and when, in its judgment, such investigation shall appear meritorious, the Secretary of the Smithsonian Institution may direct that an amount from this sum ($20,000 appropriated from Treasury funds) equal to that contributed by such State, educational institution, or scientific organization, not to exceed $2,000, to be expended from such sum in any one State during any calendar year, be made available for cooperative investigation * * *.

The scope of this ethnological research was extended by the act of August 22, 1949. The act of August 15, 1949, provided for similar cooperation by the Smithsonian Institution in paleontological investigations.

b. National Zoological Park

The act of April 30, 1890, gave control of the National Zoological Park to the Smithsonian Institution.

c. National Gallery of Art

On December 22, 1936, Andrew W. Mellon, through the A. W. Mellon Educational and Charitable Trust, offered the United States his collection of paintings and sculptures and sufficient funds to construct a National Gallery of Art. His offer also included an endowment fund, later set at $5 million, "the income from which shall be used to pay the annual salaries of a director, assistant director, secretary, and curators of the gallery, and for future art acquisitions." [65]

In both Houses of Congress proposals were introduced to set up a National Gallery of Art as a bureau of the Smithsonian Institution in

[65] Letter from A. W. Mellon to President Franklin D. Roosevelt, Dec. 22, 1936. Quoted in hearings on H.J. Res. 27, before the House Committee on the Library, 75th Cong., 1st sess., pp. 1–3 (1937).

priate branches of the armed services all inventions, inventive ideas, and new products and processes submitted by the public as a contribution to the war effort. The council included in its membership noted inventors, industrialists, and public officials, including Army and Navy representatives. In January 1947 the Secretaries of War and Navy asked the council to continue for an indefinite period its work of screening military inventions. The technical supporting staff which receives and evaluates inventions is now a part of the Office of Technical Services of the Department of Commerce. Dr. Charles F. Kettering, General Motors Research Corp., was chairman until his death in 1958. He was succeeded by Dr. Charles Stark Draper, Massachusetts Institute of Technology. Homer H. Ewing is secretary.

William C. Foster, Under Secretary of Commerce, in testifying before the Senate Committee on Commerce (on the bill to establish an Office of Technical Services, May 19, 1957, p. 58), described the work of the council as providing a two-way service:

> (1) Important inventive problems encountered by the armed services are brought to the attention of American inventors, and (2) the ideas of inventors of potential military use are received by the council and after being sifted are referred to the appropriate military agencies.

Maj. Gen. Henry S. Aurand, director of Research and Development Division, War Department, testified before the Senate Committee on Commerce (May 21, 1947, p. 77), and gave statistics about the National Inventors Council. Between 1940 and 1946, the council received over 360,000 cases. Of these, 204,000 were evaluated and 14,000 interviews were given. Of these, 8,000 were recommended to the Army and Navy, 750 were tested, and 107 accepted for production and use.

The National Inventors Council was given statutory authority under Public Law 776, which established the Office of Technical Services (discussed supra). This law provided for continuation of the functions relating to the reference to the armed services of all scientific or technical information having an immediate or potential practical military value or significance. Public Law 776 provided for further reference of information to the heads of other Government agencies in cases where such information related to activities within the primary responsibility of such agencies.

V. SMITHSONIAN INSTITUTION

A. BACKGROUND

On June 27, 1829, James Smithson, an Englishman, died at Genoa, Italy. His will stated that in the event his nephew had died and had no heirs, Smithson's money was to go to the United States:

> I then bequeath the whole of my property * * * to the United States of America, to found, at Washington, under the name of the Smithsonian Institution an establishment for the increase and diffusion of knowledge among men.[61]

[61] House Select Committee on the Smithsonian Bequest, H. Rept. 277, 26th Cong., 1st sess. (1840). The reports by this House committee are hereinafter cited as "Smithsonian bequest."

and the Division of Medical Sciences has studied the after effects of the atomic bomb explosions in Japan.[88]

The U.S. National Committee for the International Geophysical Year was established by the Academy-Research Council. The Council also assumed direction of the United States World Data Center.[89]

The achievements reported above show only a few of the research projects and activities undertaken by the National Research Council, in carrying out the aims prescribed for it in its "Articles of Organization":

> It shall be the purpose of the National Research Council to promote research in the mathematical, physical, and biological sciences, and in the application of these sciences to engineering, agriculture, medicine, and other useful arts, with the object of increasing knowledge, of strengthening the national defense, and of contributing in other ways to the public welfare, as expressed in the Executive Order of May 11, 1918 (art. I).[90]

VII. NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

On October 1, 1958, the National Advisory Committee for Aeronautics was absorbed into the new National Aeronautics and Space Administration, and its independent existence came to an end.

A. BILLS PROPOSING RESEARCH IN AERONAUTICS—PRIOR TO 1915

Although proposals for an Advisory Committee for Aeronautics were not introduced until 1915, three bills prior to that date provided for research in aeronautics.

S. 8402 (Mr. Stone) and H.R. 28679 (Mr. Peters), were introduced in the 62d Congress on February 7, 1913.

S. 8402 and H.R. 28679 proposed establishment of a National Aeronautical Laboratory which was to be under the supervision of the Board of Regents of the Smithsonian Institution (sec. 1). Section 2 set forth the duties of the Laboratory as follows:

> That the functions of the Laboratory shall be the study of the problems of aeronautics, with such research and experimentation as may be necessary to increase the safety and effectiveness of aerial navigation for the purpose of commerce and national defense.

The Laboratory was to work for the Government and also for private concerns, who would pay the costs of the research (sec. 3); it was to make public the results of its experiments through "bulletins for public distribution" (sec. 7). Section 8 established an aeronautical committee, composed of the Laboratory's director, an aeronautical officer from the War Department and one from the Navy Department, the Secretary of the Smithsonian Institution, the Chief of the Weather Bureau, the Chief of the U.S. Bureau of Standards, and seven other persons acquainted with the field, three of whom were to be from

[88] British Commonwealth Scientific Office, North America. Notes on science in U.S.A. 1954, pp. 4–5 (London, Her Majesty's stationery office, 1955).
[89] National Science Foundation, Eighth Annual Report, 1958, pp. 93, 94.
[90] Quoted in consolidated report upon the activities of the National Research Council 1919–32, p. 9.

On April 2, 1958, President Eisenhower's message to the Congress (H. Doc. 365) relative to space science and exploration proposed the establishment of a strong civilian agency, with the National Advisory Committee for Aeronautics as its nucleus, to direct a national program for outer space. This message read, in part:

> Recent developments in long-range rockets for military purposes have for the first time provided man with new machinery so powerful that it can put satellites into orbit, and eventually provide the means for space exploration. The United States of America and the U.S.S.R. have already successfully placed in orbit a number of earth satellites. In fact, it is now within the means of any technologically advanced nation to embark upon practicable programs for exploring outer space. The early enactment of appropriate legislation will help assure that the United States takes full advantage of the knowledge of its scientists, the skill of its engineers and technicians, and the resourcefulness of its industry in meeting the challenges of the space age.
>
> During the past several months my Special Assistant for Science and Technology and the President's Science Advisory Committee, of which he is the Chairman, have been conducting a study of the purposes to be served by a national space program, of the types of projects which will be involved, and of the problems of organizing for space-science functions. In a statement which I released on March 26, 1958, the Science Advisory Committee listed four factors which in its judgment give urgency and inevitability to advancement in space technology. These factors are (1) the compelling urge of man to explore the unknown; (2) the need to assure that full advantage is taken of the military potential of space; (3) the effect on national prestige of accomplishment in space science and exploration; and (4) the opportunities for scientific observation and experimentation which will add to our knowledge of the earth, the solar system, and the universe.
>
> These factors have such a direct bearing on the future progress as well as on the security of our Nation that an imaginative and well-conceived space program must be given high priority and a sound organization provided to carry it out. Such a program and the organization which I recommend should contribute to (1) the expansion of human knowledge of outer space and the use of space technology for scientific inquiry, (2) the improvement of the usefulness and efficiency of aircraft, (3) the development of vehicles capable of carrying instruments, equipment, and living organisms into space, (4) the preservation of the role of the United States as a leader in aeronautical and space science and technology, (5) the making available of discoveries of military value to agencies directly concerned with national security, (6) the promotion of cooperation with other nations in space science and technology, and (7) assuring the most effective utilization of the scientific and engineering resources of the United States and the avoidance of duplication of facilities and equipment.

Committee on the Transit of Venus, 1871.
Committees on the Restoration of the Declaration of Independence, 1880, 1903.
Committee on the Inauguration of a Rational Forest Policy for the Forested Lands of the United States, 1896.

The number of Government requests decreased somewhat after 1888 and it is important to note that although science was becoming increasingly important, research in later years was being carried on not only by the National Academy, but also by many new scientific organizations. The necessity of coordinating the research of these groups and that of the National Academy was largely met by the founding of the National Research Council,[73] considered infra.

B. THE NATIONAL RESEARCH COUNCIL

1. ESTABLISHMENT

The National Research Council was not established by congressional legislation, but was created as a result of President Wilson's acceptance in April 1916 of an offer by the National Academy of Sciences to bolster America's scientific strength in the light of the impending war. On June 19, 1916, the National Academy of Sciences approved the plan of its Committee on Organization and urged: [74]

> That there be formed a National Research Council, whose purpose shall be to bring into cooperation existing governmental, educational, industrial, and other research organizations with the object of encouraging the investigation of natural phenomena, the increased use of scientific research in the development of American industries, the employment of scientific methods in strengthening the national defense, and such other applications of science as will promote the national security and welfare; (and)
>
> That the Council be composed of leading American investigators and engineers, representing the Army, Navy, Smithsonian Institution, and various scientific Bureaus of the Government; educational institutions and research endowments; and the research divisions of industrial and manufacturing establishments.

President Wilson accepted the plan on July 24, 1916. The National Research Council met for the first time on September 20, 1916, and for 2 years it served the military needs of the country. On May 11, 1918, it was given a more permanent status by Executive Order No. 2859 issued by President Wilson.[75] The order stated:

> The National Research Council was organized in 1916 at the request of the President by the National Academy of Sciences, under its congressional charter, as a measure of national preparedness. The work accomplished by the

[73] Detlev W. Bronk, News Report, National Academy of Sciences, National Research Council, vol. 1 (January-February 1951).
[74] "Preliminary Report of the Organizing Committee," proceedings, National Academy of Sciences, vol. 2, p. 508 (August 1916). (Quoted in National Research Council Consolidated Report upon the "Activities of the National Research Council, 1919–32," pp. 5–6, prepared in the Office of the Permanent Secretary with the assistance of the Chairman of Divisions of the Council (Washington, 1932).)
[75] "Consolidated Report Upon the Activities of the National Research Council 1919–32," pp. 6–7.

PART 3. PATENT EXTENSIONS

I. HISTORICAL BACKGROUND

In the early days of this country, a considerable number of patents were extended both by special act of Congress and, for a time, by the Patent Office. Between 1809 and 1887, 37 special acts were enacted by Congress, extending the patents of various individuals. Since 1887, only one patent has been similarly extended, to wit, the "Ronson lighter" patent which was extended in 1944 under some unusual circumstances, discussed infra. A table listing these 38 special acts is set forth in appendix C.

Prior to the act of 1836, the power to extend patents was lodged in Congress. At that time, the term of the patent was 14 years and no more. In 1836, jurisdiction over the renewal as well as the first issue of letters patent was conferred upon the Patent Office, subject to numerous restrictions as to the grounds of renewal and the duration of the extended term. The term of 14 years was retained in the act of 1836, but the provision for the extension was 7 years.

By the act of March 2, 1861,[111] this jurisdiction over extensions was withdrawn as to all patents granted after the passage of that act, and Congress thereby became the only source from which an increase of the monopoly created by future patents could be obtained. At the same time, however, the act of 1861 extended the term of patents to 17 years.

This act had its origin in Senate bill No. 10. It repealed section 5 of the act of 1836, which had fixed the term of a patent at 14 years, and section 18 of the same act, which had provided for an extension of the original term for a period of 7 years. This bill, in the form in which it passed the Senate, contained no provision for either extending the term of a patent or for repealing or modifying section 18 of the act of 1836. The House, however, amended the bill by adding a section which read as follows:

> * * * there shall be no further extension of any patent when it shall appear to the Commissioner that the profits of said patent, including sales made by the assignee or assignees of said invention, shall amount to one hundred thousand dollars.

The Senate disagreed with the House provision as to assignees, on the ground that the assignees might be unable or unwilling to give an accounting, and that the inventor could not compel them to do so. The bill then went to a conference committee. Up to this time it had not contained any provision either to change the duration of patents or to repeal the law providing for their extension. The conference committee struck out the entire section, and substituted the short one, which stands as section 16 of the act, reading as follows:

> That all patents hereafter granted shall remain in force for the term of seventeen years from the date of issue; and all extension of such patents is hereby prohibited.

[111] 12 Stat. 246 (1861).

"These men (scientists) have a natural—and historically by no means groundless—apprehension that Federal subsidy can be a serious threat to the academic independence that higher education has always guarded so jealously."

(5) A formula for the distribution of research funds which is unduly restrictive.

(6) Patent provisions which do not belong in a measure of this nature.

(7) Patent provisions which because of their nature virtually might confiscate a form of private property.

(8) Patent provisions which because of their complex language provide much uncertainty as to what the law might be.

(9) Patent provisions which because of their tenor might well tend to discourage rather than encourage private initiative.

The reasons for approving certain features and disapproving others, as above enumerated, are set forth in our main statement.

(9) *William C. Foster*, Under Secretary of Commerce (pp. 171–177), declared:

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. 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 * * *.

* * * 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.

(10) *Randolph T. Major*, director of research and development, Merck & Co. (pp. 177–181), supported establishment of a Foundation as proposed in the four bills, but did not favor enactment of the Celler bill. He preferred a board to a single administrator. He disapproved the inclusion of social sciences. As for the patent provisions, he said:

I think that it would be particularly undesirable to tack on to the Science Foundation bill a rider proposing to make drastic changes in the patent policies of all Government agencies as is attempted in the Celler bill (H.R. 942).

(11) *Robert M. Yerkes*, emeritus professor of psychobiology, Yale University, chairman of Committee on the Federal Government and Research, Social Science Research Council (pp. 182–191), gave reasons why the Foundation would need a broad scope. He listed some of the important issues to be studied as follows:

(1) Labor-management relations—problems of man versus machine in a highly industrialized free-enterprise system; (2) population control—quantity, migrations, immigration; (3) taxation—which bristles with social and other biological

closure of a new and useful invention, society grants to him the right to practice it (if he can also overcome these hurdles) and exclude others from so doing, for an intended period of 17 years. He delivers his part of the contract; he naturally expects society to do the same. Having overcome these hurdles he has the right to expect that society itself will not interpose unexpected hurdles of its own, to interfere with what returns he can derive from his efforts at invention. If, however, society itself does interfere with his exploitation of the invention for any portion of that 17-year period, the inventor is in the position of one who has delivered his part of a contract and finds himself shortchanged by the other party to the bargain.

(4) *Paul A. Rose*, chairman, committee on laws and rules, American Patent Law Association (pp. 93–102), said that the American Patent Law Association was opposed in principle to the extension of the terms of patents as proposed in the bills under consideration. Such extensions, he stated, were not believed to be in the public interest or in the interest of the patent system in this country. They were also contrary to the established policy of the Congress against extension. The proper remedy, according to the association, would be by way of special legislation restricted to individual patents, rather than general legislation.

These bills were not reported out of committee, and no further action was taken on them.

2. OTHER BILLS INTRODUCED IN THE 82D CONGRESS

H.R. 3231, March 14, 1951 (Mr. Davis of Wisconsin).
H.R. 7394, April 4, 1952 (Mr. Budge).
H.R. 7552, April 23, 1952 (Mr. Magnuson).
S. 1986, August 9, 1951 (Mr. Dirksen).
S. 3096, May 1, 1952 (Mr. Dworshak).

No hearings were held on any of these bills and they received no further action.

3. BILLS INTRODUCED IN THE 83D CONGRESS, UPON WHICH HEARINGS WERE HELD

a. Provisions

H.R. 1228, January 7, 1953 (Mr. Budge). It proposed to amend the act of June 30, 1950, to allow an extension to "persons, firms, or corporations as coowners of patents." This would increase the coverage of the law, which at that time allowed an extension to the inventor-veteran only if he were sole owner of the patent or coowner with his wife.

H.R. 1301, January 7, 1953 (Mr. Reed). This bill was similar to H.R. 323 (82d Cong), described supra, p. 164.

H.R. 2309, January 29, 1953 (Mr. Scott). It contained the following provisions:

(a) it is the policy and purpose of this act to provide for the extension of the term of any patent where—

(1) to further the interests of the United States of America, the owner of such patent has heretofore granted

award the Government title to patents developed with the use of Government funds would, in any way, infringe upon this right.

Perhaps some may think that this oversimplifies the matter but I have long felt that the patent provisions of the many laws surrounding Government research work could be simplified to a greater extent.

I do feel strongly that no provision of the law setting up the Space Agency should ever be construed to confer on any individual a right which could in any way impede or restrict the use of relevant technology by our Government for domestic or for international purposes. An unequivocal statement to this effect in the law would be an earnest of our intention to help other nations.

I hope these comments are of help to you.

Sincerely yours,

H. G. RICKOVER,
Rear Admiral, U.S. Navy.

(3) *Rear Adm. John T. Hayward,* Assistant Chief of Naval Operations (Research and Development) (pp. 274–306), agreed with the need for a comprehensive program of research in space sciences and a national space program.

He commented briefly on the Soviet system of awards, saying:

> They also have competition in designs and incentives. The results of people like Djurvich and Alushkin, who have won the Lenin prize four or five times; and that is $3,500 tax free in our country's money.
>
> Of course, they do have a double incentive, as Admiral Rickover said; they either produce or get shot. If they produce, they are rewarded. If they do not, they get shot.

(4) *Dr. John P. Hagen,* Director of the Vanguard Project, Naval Research Laboratory (pp. 307–367), began his testimony as follows:

> It is a great opportunity for me to be here to talk with the committee concerning this bill. I think the work of this select committee arises because the Russian satellite accomplishments brought into focus, and into the public eye, the Soviets' determined national effort and singleness of purpose not only to lead the world in the arts of weaponry, including ballistic missiles, but to base this effort on a broad foundation of education, research, and science and technology with the very obvious purpose of outstripping and perhaps dominating she world we know and the world that is to come. It is also obvious that the Russians have a plan for doing this and are dedicated to the task.
>
> * * * * *
>
> However, before we figuratively leap into space we must learn well the lessons of the past, carefully examine our present needs and bring our resources forward with purpose and utilize them wisely to their maximum potential.
>
> We should revitalize the free spirit of inquiry which is so essential to our democratic way of life. We should investigate rather than fear the unknown and allow freer range of

11. Classified scientific material does not exist for the many scientists who do not work on Government contracts.

(6) *Dr. H. Guyford Stever*, associate dean of engineering, Massachusetts Institute of Technology, chairman, National Advisory Committee on Aeronautics, Special Committee on Space Technology (pp. 389–400), had the following to say about the type of organization which would best handle the problems of astronautics and space exploration:

> Without going into great detail about all the possible organizations proposed to do this job, let me say that, for several reasons, I favor the use of the NACA as a nucleus of a new organization to conduct our nonmilitary work in astronautics and space exploration. In the first place, the NACA laboratories have already done, and are continuing to do, a great deal of work in this field, particularly on the flight techniques. In the second place, NACA's relationship with the National Science Foundation and the National Academy of Sciences is such that they can use the important scientific research capabilities which these two organizations have. In the third place, NACA has longstanding close relationships with the military; there is a great overlap in the military and the nonmilitary uses of equipment for space exploration and experimentation. The new organization can use these well-founded relationships, first, to help the military solve its problem, and, second, to help itself by using military equipment.
>
> It is important to consider this a new organization rather than an expanded NACA, for it must have a capability to contract with industry and academic institutions to perform sizable portions of this program. The NACA does not do this at the present time to the extent that will be necessary in this new activity.
>
> Finally, there is one important point which is fundamental to this entire operation. It has to do with the decentralization of authority and responsibility, once the program is decided upon. In those stages in which we are now, essentially, discovering what our objectives are, what our organization should be, and what general program should be followed, I think it is important to tap all of the ideas from all sources. As we begin to carry out this program, we must continue to tap these ideas from capable organizations and individuals to find out what scientific experiments to perform, and to discover what techniques we should use to carry out scientific experiments into space. But, having decided upon an experiment or a program of experiments, I believe it is essential that responsibility and authority be delegated down to the working, technical level. A very complicated superstructure of detailed technical management within the Government, I believe, has seriously hampered some of our most important projects in space technology to date.
>
> I believe that the leaders within the NACA understand this fundamental requirement for rapid progress in a technical venture.

out the major points on which there was room for differences of opinion:

The first was whether there should be a Policy Board and an operating agency headed by a single civilian or just the one-man agency We decided on having a Policy Board, with the operating agency under the Policy Board—with the Board located in the Office of the President of the United States.

Another question was whether there should be a joint committee of Congress, or two separate committees, one in the House and one in the Senate, having jurisdiction over the field, covered by the bill. The House bill provided for separate committees. The Senate committee bill has provided for a joint committee. That question can be ironed out in conference.

The third subject was the question of special pay. That question has been worked out briefly in the Senate bill by permitting enough authority for supergrades for the space agency to commence operations, and then getting a recommendation from the Civil Service Commission on pay scales.

The fourth question concerned the transfer authority. There is no provision for transfer authority in the Senate bill. Broad transfer authority was provided in the House bill. It was felt that the subject could be worked out in conference.

The Senate has deleted the patent rights provision from the bill. That matter can also be worked out in conference as is true of the transfer authority provision.

Lastly, there was the question of the jurisdiction of the Department of Defense on purely defense matters. That provision was amended by the full committee in the draft of the bill, and has been discussed by the eminent Senator from Texas and the eminent Senator from New Hampshire. I shall not elaborate on it.

H.R. 12575, as amended by the Senate, was passed in lieu of S. 3609 on June 16, 1958.

D. CONFERENCE REPORT AND PUBLIC LAW 568

A conference was held on July 15, 1958 (H. Rept. 2166), and the differences reconciled and some of the original provisions rewritten. This bill was agreed to by the House and the Senate on July 16, 1958, and signed into law on July 29, 1958.

Some major points of the substitute bill, and some of the differences between it and the House and Senate versions, are as follows:

Section 102, dealing with policy and purpose, declared in subsection (a) that it is to be the policy of the United States that activities in space should be devoted to peaceful purposes.

Subsection (b) delineated in the field of aeronautical and space activities the responsibility which will be exercised by the new civilian space agency and that which will be exercised by the Department of Defense. The House and Senate language differed considerably in approach but not in intent, and both provisions suffered from what the

outer space be devoted to peaceful purposes, and that the exploration of space be so conducted as to promote world peace. (2) While keeping control in a straight-line civilian organization formed around the NACA as a nucleus, with authority and responsibility vested in a single Administrator assisted by an Advisory Committee, the bill sought to assure maximum cooperation and exchange of scientific and technical ideas and information between civilian and military organizations by providing for (a) such cooperation on all matters involving both peaceful applications and military requirements; and (b) freedom for the military department to conduct such basic and applied research and development as may be necessary and appropriate to their military missions.

To accomplish these purposes, the civilian agency was directed, and not merely authorized, to cooperate with the Department of Defense—and also with the Atomic Energy Commission and other departments and agencies concerned. In describing the field of cooperation, the committee kept the language of the previous bill—"peculiar to or primarily associated with weapons systems or military operations"—but broadened it by adding: "or the defense of the United States (including the research and development necessary for the defense of the United States)."

Other important changes are summarized in the committee report as follows (pp. 7–8):

> (3) As to matters of organization, the bill provides not only for an Administrator but for a Deputy Administrator (both appointed by and with the advice and consent of the Senate) and for a General Counsel. It further provides for divisions on military and nuclear application respectively, and for such other divisions as the Administrator finds necessary.
>
> (4) The bill establishes a Military Liaison Committee, similar to that of the Atomic Energy Commission, and also an Atomic Energy Liaison Committee. The Chairmen of these Committees would be appointed by the President. Other members would be assigned by the Secretary of Defense and the Atomic Energy Commission respectively.
>
> In effect, the Military Liaison Committee provides the machinery for carrying out the policy of civilian control and civilian-military cooperation.
>
> (5) The composition of the 17-member Advisory Committee has been changed. The bill provides that 9 members, rather than a maximum of 8, shall be appointed from appropriate departments and agencies of the Federal Government, and that a minimum of 3, rather than 1, shall be from the Department of Defense. In making this change, also recommended by the administration at a late stage, your committee's thought was that the Advisory Committee would perform liaison and coordinating, as well as advisory, functions within the Federal Government. Four-year terms are stipulated for the members, except that the President may make initial appointments for shorter terms.
>
> In the previous bill (which designated the head of the Agency as the Director), the Director was required to consult the Board (as it was then designated), though not to take

A Board of 24 members was to be selected solely on the basis of established records of distinguished service, and to consist of persons eminent in the fields of the sciences, etc.

The Director of the Foundation shall be appointed by the President, with the advice and consent of the Senate. The Board may make recommendations to the President with respect to his appointment, and the Director shall not be appointed until the Board has had an opportunity to make such recommendations. The Director should exercise powers in accordance with the policies established by the Board. The Board must review and approve actions taken by him.

The divisions within the Foundation are to be: (1) Division of Medical Research; (2) Division of Mathematical, Physical, and Engineering Sciences; (3) Division of Biological Sciences; and (4) Division of Scientific Personnel and Education, which shall be concerned with programs of the Foundation relating to the granting of scholarships and graduate fellowships in the mathematical, physical, medical, biological, engineering and other sciences. The Board may establish such other divisions as it deems necessary.

Scholarships and fellowships are to be given solely on the basis of ability, but in cases of two equally qualified applicants and one scholarship, it will be awarded so as to achieve the widest geographical distribution.

In the case of patent rights, each contract shall contain provisions governing the disposition of inventions 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 made, provided that the Foundation shall not enter into any arrangement inconsistent with the patent law. No employee may retain rights under the patent laws to any invention he makes during performance of his duties with the Foundation.

H. 83D CONGRESS (1953–54)

1. BILLS INTRODUCED (S. 977 AND H.R. 4689)

S. 977 (Messrs. Smith (N.J.) and Aiken) was introduced February 18, 1953; and H.R. 4689 (Mr. Wolverton), identical to S. 977, was introduced April 20, 1953. They called for amendment to the National Science Foundation Act as follows:

(1) By striking from subsection (d) of section 4 the sentence "A majority of the voting members of the Board shall constitute a quorum" and inserting in lieu thereof the sentence, "Eight of the voting members of the Board shall constitute a quorum."

(2) By striking from subsection (a) of section 16 the words "not to exceed $500,000 for the fiscal year ending June 30, 1951, and not to exceed $15,000,000 for fiscal years thereafter" and inserting in lieu thereof the words "such sums as may be necessary to carry out the provisions of the Act."

Hearings were held by the House Committee on Interstate and Foreign Commerce and by the Senate Committee on Labor and Public Welfare. S. 977 was reported out on July 11, 1953 (S. Rept. 396), and H.R. 4689 on May 11, 1953 (H. Rept. 374), both with amendments. S. 977 was passed in the Senate on June 13, 1953. It was passed in the House, in lieu of H.R. 4689, on August 3, 1953.

S. 977 became Public Law No. 223 on August 8, 1953.

programs of committees but, rather, it adds to and greatly expands the role of each. In fact, if our blueprints are proper and our building adequate, we should assure that after this period of transition there will be a diminished need for special agencies and special committees to deal with space.

Space affects all of us and all that we do, in our private lives, in our business, in our education, and in our Government. We shall succeed or fail in relation to our national success at incorporating the exploration and utilization of space into all aspects of our society and the enrichment of all phases of our life on this earth.

(2) *Wilber M. Brucker*, Secretary of the Army (pp. 215–236), told of the immensity of the task involved in forging ahead and maintaining indefinitely a commanding lead in the scientific and technological progress leading to development of outer space. His views on the legislation were summarized as follows:

I concur in the concept that the National Aeronautics and Space Agency should be a civilian agency with Department of Defense representation. Such military representation is particularly important to the overall success of NASA since within the Department of Defense programs are to be found most of the talent, and most of the physical assets which are necessary to the immediate programs which would be carried on by the NASA. The NASA, therefore, will have major dependence upon the Department of Defense for a long time to come.

As set up under S. 3609, the Advisory National Aeronautics and Space Board would consist of not to exceed 17 members, at least 1 to represent the military interest, and the rest concerned with the civilian interest. It seems clear to me that whatever the composition of the Advisory Board may be, fully adequate military liaison will be established and maintained with the working group of the Agency to the end that military requirements are given adequate consideration.

I believe the Department of Defense should be assured the same working relationship with the proposed NASA as with the National Advisory Committee on Aeronautics. I see no major problems in establishing effective cooperation between the National Aeronautics and Space Agency and the Department of Defense, particularly since Department of Defense responsibility is now centered in the Advanced Research Projects Agency. However, it is possible that the bill now under consideration could be interpreted so as to restrict unduly the activities of the Department of Defense in the astronautics and space field. It is frequently difficult to determine as we embark on so vast and unknown an enterprise as space exploration just what facets of this exploration will have application to weapons systems and military operation. I do not believe it to be the intent of the administration or of the Congress to prohibit research in this area by the agencies of the Department of Defense.

The legislative line should not be drawn too sharply between what the Department of Defense and its agencies can

b. S. 2385, March 25, 1948 (Messrs. Smith, Cordon, Revercomb, Saltonstall, Thomas (Utah), Kilgore, Magnuson, and Fulbright)

S. 2385 did not clearly define the role and authority of the Director or the Board. There was no provision for a percentage distribution of funds. It provided that each contract should contain provisions for disposition of inventions. There was no provision for inclusion of the social sciences.

c. Other bills (H.R. 6238 and H.R. 4852)

H.R. 6238, April 14, 1948 (Mr. Van Zandt), was identical to H.R 6007. H.R. 4852, January 6, 1948 (Mr. Priest), was similar to S. 526, passed and vetoed the previous session.

2. HEARINGS AND SIGNIFICANT TESTIMONY

Hearings were held on June 1, 1948, before the House Committee on Interstate and Foreign Commerce on H.R. 6007 and S. 2385.

a. Specific witnesses

(1) *Vannevar Bush* (pp. 15–16) expressed gratification that the final issue in controversy—the form of organization of the Foundation—had been resolved to the satisfaction of the principal groups concerned. He found the organization proposed by H.R. 6007 to be sound and workable.

He said:

> It would assure full responsibility of the Foundation to the President on those administrative matters which are properly the function of the Executive. At the same time, real authority is matched with responsibility in a representative group of scientists with respect to matters involving scientific evaluation and basic policies.

(2) *Lawrence R. Hafstad*, executive secretary of the Research and Development Board (pp. 29–45), described the need for basic research in the field of guided missiles and other military research. He agreed with Dr. Bush on the administration. Although he stressed the utmost importance of basic research, he objected to wording that would limit the organization to basic research only, since there might be occasions (emergency, etc.) where it would be desirable to carry on applied research, too.

(3) *Hugh Wolfe*, representing the Federation of American Scientists, and professor of physics, New York City College (pp. 80–94), told of the Federation's wanting an early establishment of the Foundation. As between the two bills, S. 2385 and H.R. 6007, he said:

> We see great advantages in the executive committee setup which is provided for in H.R. 6007, and the more precise delineation of responsibilities which in one section seems to say that the Director, within the limits of policy set by the executive committee, shall be responsible for carrying out the intent on the bill.

approval of the Attorney General, to approve agreements between small business firms for joint programs of research and development, if the Administrator finds that the joint program proposed will maintain and strengthen the free enterprise system and the economy of the Nation.

g. S. 4033, June 19, 1958 (Mr. Javits)

Small Business Research and Development Assistance Act of 1958 authorized the Small Business Administrator, with the approval of the Attorney General, to approve any agreement between small business firms providing for a joint program of research and development, if the Administrator finds that the joint program proposed is consistent with the competitive, free enterprise system and will strengthen the national economy. Authorized the Administrator to make loans to any research and development organization established pursuant to an approved agreement, in order to provide such organization with funds needed for sound financing, growth, and experience, such loans to have a maturity not exceeding 30 years. Increased the revolving fund to a total of $550 million (now $530 million). Provided that loans to research and development organizations shall not exceed an aggregate of $20 million outstanding at any one time.

2. HEARINGS AND ACTION TAKEN

a. Hearings, House of Representatives

Hearings on H.R. 6645 and H.R. 7474 were held by the House Committee on Banking and Currency, May 14, 15, 16, 21, and 22, 1957. The only testimony of significance relating to the encouragement and support of research and development and assistance to small business in that area, was by *Wendell B. Barnes*, administrator of the Small Business Administration (pp. 18–113), who reported as follows on the contracts awarded in fiscal year 1956:

> The Department of Defense has reported that small business concerns were awarded 5.9 percent of its research and development prime contracts during fiscal year 1956. Small firms were awarded 9.7 percent of total Army contracts, 9.4 percent of Navy contracts, and 3.7 percent of Air Force contracts. However, since awards to educational and nonprofit institutions are included in these small business percentages, they do not adequately reflect the volume of research and development contracts going to small firms.
>
> In their procurement counseling, Small Business Administration staff members stress to qualified small business concerns the importance of their trying for research and development work and guide them to the proper offices. This is important, because a firm which performs a research and development contract has an advantage over competitors when the production contract for the item is awarded.
>
> During the last half of calendar year 1956, one-fourth of the value of all procurements screened by the agency's representatives at the Quartermaster Research and Development Command, Natick, Mass., was jointly set aside for

It provided for the transfer of the functions, powers, duties, property, and personnel of the National Advisory Committee for Aeronautics to the Administration, and authorized the President during the next 4-year period to transfer to the Administration any function of any other department or agency which relates primarily to the functions, powers, and duties of the Administration.

Section 305 relating to patent rights (the full text of which appears in appendix B, infra) provided in substance as follows: (a) An invention made under Administration contract shall belong to the Administration (1) in the case of research employment, where it relates to such research, is within the inventor's duties, or involves Government facilities, time, etc., and (2) in the case of nonresearch employment, where it relates to the inventor's duties and involves Government facilities, time, etc. (b) Administration contracts shall require contractors to report any inventions made in the performance thereof. (c) No patent may issue (except to the Administrator) on inventions useful in conducting aeronautical and space activities unless the applicant files a statement with the Commissioner of Patents of the circumstances of the invention and the relation, if any, to work under Administration contract. (d) Any patent on an invention referred to in subsection (c) shall issue to the Administrator on his request unless the Board of Patent Interference, to which the applicant may refer the matter, concludes that the latter is entitled to it. (e) Any patent issued to applicant under subsection (d) as a result of misrepresentation by him may be assigned to the Administrator upon proceedings, as prescribed, brought in the Patent Office. (f) The Administrator may waive rights in any invention upon determination that "the interests of the United States will be served thereby," but subject to a free nonexclusive license for the United States (and foreign countries pursuant to treaty); proposals for such waiver to be made to an Inventions and Contributions Board which, after hearings, shall make recommendations to the Administrator with respect thereto. (g) The Administration shall set the terms and conditions for licensing patents held by it. (h) It shall take suitable action to protect inventions it owns and require others to protect those under which it is licensed. (i) The Administration is classified as a defense agency for purposes of chapter 17 of title 35. (j) Definitions.

Section 306 relating to "contributions awards" (the full text of which appears in appendix B, infra) provides as follows: (a) The Administration may make monetary awards to persons making scientific or technical contributions of significant value in aeronautical and space activities; the Inventions and Contributions Board, after hearings, shall make recommendations to the Administration; factors to be considered are: (1) value of the contribution, (2) development expenses of the applicant, (3) compensation previously received, and (4) other factors. (b) If there is more than one applicant for the same contribution, the Administration shall make or apportion the award in such manner as it deems equitable; the conditions of the award are (1) that applicant surrender all claims against the United States (or foreign countries pursuant to treaty) and (2) a $100,000 maximum, except that a larger award may be made if submitted to Congress and the latter does not object within 30 days.

the original term of which remains unexpired at the time of filing * * *.

* * * * * *

(F) The period of extension * * * shall in no case exceed a further term of three times the length of his said service in the military or naval forces * * *.

b. Hearings and significant testimony

Hearings were held before the House Committee on Patents on March 23 and April 13, 1928, on H.R. 10435.

Testifying in favor of the legislation were representatives from the American Legion and the Disabled Veterans.

(1) *Col. John Thomas Taylor*, National Legislative Committee, American Legion (pp. 2–7), explained his reasons for favoring the bill as follows:

> This bill won't cost the U.S. Government a single penny. We contend that when this Government granted a patent to these men, the Government entered into a quasi contract with them for a period of 17 years. Then along came the war and there was a bigger contract, a much bigger contract, and the Government reached over and just took these men and put them in the service. The second contract that the Government entered into with the men, the contract for them to perform military service, interfered with this first contract to such an extent that they were not able to develop the possibility of making some money out of their patents.

(2) *James F. Smathers*, Legionnaire (pp. 15–20), told of his own experience of loss on his invention.

> In 1913 I secured a patent and my means were very limited and I had to work a while and pay a modelmaker, then work a while again. So the years went by and I got a model built and was just about to make some arrangements for marketing it, or planning at least for marketing it, when the war came on. * * *
>
> I went into the Army in November 1917, went overseas and was brought back home and discharged in June 1919, approximately 21 months after entering the Army. I had borrowed money and had made fair arrangements for carrying on my development work before I joined the Army. When I came back all those financial plans were disrupted; the banks knew I did not have anything and I could not resume my borrowing from them, as I had done prior to the time I went away. So I first had to turn in and work for a year or two to revamp my bank account before I could even start to make models, and in about 1921 I was able to get another model done and to start again along the course of planning and marketing my invention, and in 1923 I succeeded in making arrangements whereby a manufacturing concern took over the engineering and development work.
>
> Mr. LANHAM. In other words, but for your service in the war you could have brought this up to the point that you did in 1923 at a much earlier date?

SEC. 3. On the filing of such application * * * the Commissioner shall cause notice of such application to be published at least once in the Official Gazette. Any person who believes that he would be injured by such extension may within forty-five days from such publication oppose the same on the ground that any statement in the application for extension is not true in fact, * * * In all cases where notice of opposition is filed the Commissioner of Patents shall notify the applicant for extension thereof and set a day of hearing. If after such hearing the Commissioner is of the opinion that such extension should not be granted, he may deny the application therefor, stating in writing his reasons for such denial. Where an extension is refused, the applicant therefor shall have the same remedy by appeal from the decision of the Commissioner as is now provided by law where an application for patent is refused. * * *

2. H.R. 6346, MAY 7, 1946 (MR. RICH)—79TH CONGRESS

This bill was similar to H.R. 1190 (79th Cong.). However, it imposed in section 1 two additional conditions that the patentee must meet to be eligible for an extension:

(C) That between December 7, 1941, and the date of enactment of this Act, he was not receiving from said patent an income, or that his income therefrom was reduced by his said service.

(D) That at the time of his induction into the service he was making diligent effort to exploit the invention covered by his patent.

H.R. 6346 was submitted to the House Committee on Patents, and was reported out July 27, 1946 (H. Rept. 2686), with seven amendments which, however, did not change the original bill very much. The committee said:

Under existing law, the Government grants to the patentee the exclusive right to make, use, or sell his patented invention within and throughout the United States and its territories for a limited period of time (17 years). In other words, in consideration of the patentee's disclosing his secret to the world, Congress has provided the patentee with the exclusive right to practice his creation during the time mentioned. The courts have held that this is a contract. The bill would tend to complete the Government's part of the bargain by restoring to the patentee that which he would have enjoyed but for the interruption caused by the war.

When World War II was declared, the Selective Service Act was passed, and all able-bodied men were called to the colors, including men who were the owners of patents or who had rights under them; and it has developed that a few of them started to form or had formed organizations for the development of their patented inventions. The call to war, however, necessitated the temporary abandonment of their plans to exploit their inventions. The purpose of this legisla-

> on only a part of our national economy, although all efforts to write such provisions in the patent law itself have properly failed.

He said that the Government should have the right to use inventions free of patent claim, and should have patent rights for projects starting from scratch under Government auspices. He presented a letter from R. Morton Adams, president, New York Patent Law Association, disapproving the Celler bill.

(15) *John F. Victory*, executive secretary, National Advisory Committee for Aeronautics (pp. 224–230), declared as to administration:

> I believe that the committee-over-director form of organization has, in the NACA, been successful to a degree which would not have been attained had our director of aeronautical research been free to ignore what would have been merely the "advice" of his board of directors.

He stressed the importance of scholarships.

(16) *Vannevar Bush*, president of Carnegie Institution of Washington, chairman of the Joint Army-Navy Research Board, and Director of the Office of Scientific Research and Development (pp. 231–254), said:

> Now, both bills have many desirable objectives in common. They both establish a National Science Foundation as an independent agency. They both provide that the Foundation should support basic research. They both provide that, with respect to matters affecting the national defense, the Foundation may not only support basic research, but also perform applied research and development. They both provide for the award of scholarships and fellowships in science, to young men and women of outstanding ability, and neither bill attempts to limit the recipients to any particular field of scientific study, nor to retain any control over them after completion of their studies. Both bills contemplate an internal structure for the Foundation composed of divisions, each of which is to be concerned with a major field of science, and in addition, a Division of Scientific Personnel and Education. Moreover, they both permit additional divisions to be established when necessary or desirable. Both bills provide for an advisory committee of specialists to be attached to each division. Both bills provide for correlation of existing Government research and for fostering the interchange of scientific information, both domestically and internationally.

On differences between the bills, he said:

> The most important of these differences is the focus of ultimate authority and responsibility within the Foundation. H.R. 942 vests this authority and responsibility in a single administrator who would act with the advice of a part-time board. On the other hand, under H.R. 1830 the Foundation would be headed by a board of outstanding men, which in turn, would appoint an administrator to carry out its policies and to handle the administration affairs of the agency.

whether any such false representation was contained in such statement. Such question shall be heard and determined, and determination thereof shall be subject to review, in the manner prescribed by subsection (d) for questions arising thereunder. No request made by the Administrator under this subsection for the transfer of title to any patent, and no prosecution for the violation of any criminal statute, shall be barred by any failure of the Administrator to make a request under subsection (d) for the issuance of such patent to him, or by any notice previously given by the Administrator stating that he had no objection to the issuance of such patent to the applicant therefor.

(f) Under such regulations in conformity with this subsection as the Administrator shall prescribe, he may waive all or any part of the rights of the United States under this section with respect to any invention or class of inventions made or which may be made by any person or class of persons in the performance of any work required by any contract of the Administration if the Administrator determines that the interests of the United States will be served thereby. Any such waiver may be made upon such terms and under such conditions as the Administrator shall determine to be required for the protection of the interests of the United States. Each such waiver made with respect to any invention shall be subject to the reservation by the Administrator of an irrevocable, nonexclusive, nontransferable, royalty-free license for the practice of such invention throughout the world by or on behalf of the United States or any foreign government pursuant to any treaty or agreement with the United States. Each proposal for any waiver under this subsection shall be referred to an Inventions and Contributions Board which shall be established by the Administrator within the Administration. Such Board shall accord to each interested party an opportunity for hearing, and shall transmit to the Administrator its findings of fact with respect to such proposal and its recommendations for action to be taken with respect thereto.

(g) The Administrator shall determine, and promulgate regulations specifying, the terms and conditions upon which licenses will be granted by the Administration for the practice by any person (other than an agency of the United States) of any invention for which the Administrator holds a patent on behalf of the United States.

(h) The Administrator is authorized to take all suitable and necessary steps to protect any invention or discovery to which he has title, and to require that contractors or persons who retain title to inventions or discoveries under this section protect the inventions or discoveries to which the Administration has or may acquire a license of use.

(i) The Administration shall be considered a defense agency of the United States for the purpose of chapter 17 of title 35 of the United States Code.

(j) As used in this section—

(1) the term "person" means any individual, partnership, corporation, association, institution, or other entity;

(2) the term "contract" means any actual or proposed contract, agreement, understanding, or other arrangement, and includes any assignment, substitution of parties, or subcontract executed or entered into thereunder; and

b. Debates in Congress

On July 16, 1947, the House debated H.R. 4102 (Congressional Record, pp. 9060–9095).

Mr. Wolverton warned of the dangers in the shortage of skilled scientists, especially in the field of basic research. He said that the committee had concluded that the enlargement of the reservoir of scientists could not be accomplished without the Federal scholarship and fellowship program and it was in the interest of the Nation's welfare and security that positive steps be taken by the Federal Government to eliminate the current deficit in trained scientists.

Representatives Brown (Ohio), Sabath, and Stevenson all presented views favoring the establishment of the National Science Foundation.

Mr. Hugh D. Scott, Jr., offered an amendment striking out all after the enacting clause and inserting income tax benefits for those who had made essential contribution to fundamental research in the sciences. A point of order made by Mr. Hinshaw was sustained. Mr. Hale supported the amendment of Mr. Scott. He recognized the importance of science, but did not believe it could be helped by being "bureaucratized." He believed science could be helped by private contributions, which would come about through a change in tax laws.

Mr. Robertson offered an amendment apportioning 25 percent of the funds for research activities equally among the States; two-fifths to be apportioned among the States in equal shares and the remainder among the States in proportion to their population. The amendment was rejected.

Mr. Wolverton offered an amendment to strike out all after the enacting clause of the bill, S. 526 (see infra, pp. 59–62) and insert in lieu thereof the provisions of the bill H.R. 4102. This amendment was agreed to.

S. 526, with Mr. Wolverton's amendments, was passed by the House on July 16, 1947.

4. IMPORTANT BILLS INTRODUCED—SENATE

a. S. 525, February 7, 1947 (Mr. Thomas)

S. 525 followed the lines of the bills favoring an Administrator to be appointed by the President, 25 percent of the funds to be apportioned among the States, Government licensing of patents, and the inclusion of the social sciences.

b. S. 526, February 7, 1947 (Messrs. Smith, Cordon, Revercomb, Saltonstall, Magnuson, and Fulbright)

As introduced, S. 526 favored vesting power in a Board, did not strictly apportion the funds among the states, provided for operation within the existing patent practices of the Government, and did not include the social sciences.

H.R. 9246 (Mr. Dixon) was introduced on August 13, 1957. It would direct the National Science Foundation to initiate and support a program of study, research, and evaluation in the field of weather modification. It would abolish the Advisory Committee on Weather Control and transfer its functions, duties, and records and any unexpended funds to the National Science Foundation. No action was taken on this bill.

H.R. 10180 (Mr. Sikes) was introduced on January 21, 1958. It was, in many respects, similar to the bills introduced by Mr. Holland (H.R. 11200 in the 84th Cong. and H.R. 2450 in the 85th Cong.). It would provide for the training of additional engineers and scientists and the expansion of facilities for engineering and science education by providing scholarships and fellowships for engineering and science students under the National Science Foundation Act. No action was taken on this bill.

H.R. 11950 (Mr. Teague of Texas) was introduced on April 16, 1958. This bill was similar to H.R. 10180, above. No action was taken on this bill.

H.R. 11985 (Mr. Celler) was introduced on April 17, 1958. It would establish within the National Science Foundation, a National Scientific and Technical Information Service for the collection and dissemination of information in the fields of science and technology. No action was taken on this bill.

S. 3268 (Mr. Hill and Mr. Smith of New Jersey) was introduced on February 13, 1958, and H.R. 11257 (Mr. Harris) was introduced March 10, 1958. These bills would amend the National Science Foundation Act to provide for the annual meeting of the National Science Board during the last 2 weeks of May (now first Monday in December); to authorize the Director or the executive committee to take final action in awarding scholarships, fellowships, or contracts where such action is taken pursuant to the delegation of authority from the Board (now each scholarship, etc., requires approval by the Board); to provide for the executive committee to consist of from five to nine members (now consists of nine members); to authorize the awarding of scholarships or fellowships for study or work at any nonprofit institution (now limited to institutions of higher education); to authorize the Foundation to enter into contracts or arrangements for the carrying on of scientific activities deemed necessary (now limited to basic scientific activities); to authorize the Foundation to facilitate any international scientific activity (now cooperate with) consistent with the purposes of the act; to authorize the Foundation, with the approval of the Secretary of State, to grant scholarships, etc., to foreign nationals (foreign nationals now excluded); to authorize the Foundation, with the approval of the Secretary of State, to undertake programs of scientific activities abroad deemed to be in the interest of the United States; to authorize the Director to conduct or provide training for employees of the Foundation under certain conditions.

S. 3268 was reported, with amendment (S. Rept. No. 2367) and H.R. 11257 was reported, with amendment (H. Rept. No. 2642). S. 3268 was amended and passed by the Senate. It was also amended and passed by the House in lieu of H.R. 11257. However, the bill never got out of conference, and therefore this bill was not passed in the 85th Congress.

44515—60——6

under such rules as the Bureau shall prescribe, and such person shall by such filing waive all rights existing under the patent laws of the United States. The Bureau may analyze each invention, product, or process, when properly filed, from a scientific, economic, and legal standpoint before approving such invention, product, or process. If * * * the Bureau finds such invention * * * practicable and * * * would promote industry * * *, the Administrator, acting on behalf of the Federal Government, shall patent such invention * * * any provision of law to the contrary notwithstanding. No fee shall be charged by the Commissioner of Patents for the granting of a patent to the Administrator pursuant to this act. If the Bureau shall find such invention * * * not practicable it shall return it, together with all rights pertaining thereto, to the person submitting the same.

Section 6 provided that any person, corporation, or other organization desiring to use any invention developed under the act, shall be granted a nonexclusive license for the utilization of such invention for such period as the Administrator deems advisable. A license could not be granted if granting it to the applicant would tend to increase monopoly.

The Bureau would be paid a royalty by the licensee not to exceed 4 percent of the gross income resulting from the utilization of such invention, and the Bureau would pay a portion, not less than 50 percent of such amount, to the inventor.

Section 6 also provided:

(c) All applications for patents, question of patent interference, and infringement litigation, in which the United States is interested by virtue of its interest in such inventions, products, or processes, as provided in section 3(e) of this Act, shall be handled by the Department of Justice. The Department of Justice, upon request by the Administrator, shall intervene in behalf of any licensee of the Bureau in any litigation brought by any patent owner against such licensee for infringement or any other interference growing out of the issuance of a license by the Bureau.

(d) Notwithstanding any other provision of this Act, the Bureau shall declare secret or restricted any scientific or technical information, data, patents, inventions, or discoveries in, or coming into, the possession or control of the Bureau or any other Federal agency, the secrecy or restriction of which the President or his designee or designees certify as being essential in the interest of national defense.

b. Hearings and significant testimony

Hearings were held before a Senate subcommittee of the Committee on Commerce on December 12, 13, and 14, 1945.

(1) *Senator Fulbright* (pp. 8–13), in his explanation of S. 1248, said that it was originally to be considered with the Magnuson-Kilgore bill (S. 1850 to establish the National Science Foundation), but that S.

out the major points on which there was room for differences of opinion:

The first was whether there should be a Policy Board and an operating agency headed by a single civilian or just the one-man agency We decided on having a Policy Board, with the operating agency under the Policy Board—with the Board located in the Office of the President of the United States.

Another question was whether there should be a joint committee of Congress, or two separate committees, one in the House and one in the Senate, having jurisdiction over the field, covered by the bill. The House bill provided for separate committees. The Senate committee bill has provided for a joint committee. That question can be ironed out in conference.

The third subject was the question of special pay. That question has been worked out briefly in the Senate bill by permitting enough authority for supergrades for the space agency to commence operations, and then getting a recommendation from the Civil Service Commission on pay scales.

The fourth question concerned the transfer authority. There is no provision for transfer authority in the Senate bill. Broad transfer authority was provided in the House bill. It was felt that the subject could be worked out in conference.

The Senate has deleted the patent rights provision from the bill. That matter can also be worked out in conference as is true of the transfer authority provision.

Lastly, there was the question of the jurisdiction of the Department of Defense on purely defense matters. That provision was amended by the full committee in the draft of the bill, and has been discussed by the eminent Senator from Texas and the eminent Senator from New Hampshire. I shall not elaborate on it.

H.R. 12575, as amended by the Senate, was passed in lieu of S. 3609 on June 16, 1958.

D. CONFERENCE REPORT AND PUBLIC LAW 568

A conference was held on July 15, 1958 (H. Rept. 2166), and the differences reconciled and some of the original provisions rewritten. This bill was agreed to by the House and the Senate on July 16, 1958, and signed into law on July 29, 1958.

Some major points of the substitute bill, and some of the differences between it and the House and Senate versions, are as follows:

Section 102, dealing with policy and purpose, declared in subsection (a) that it is to be the policy of the United States that activities in space should be devoted to peaceful purposes.

Subsection (b) delineated in the field of aeronautical and space activities the responsibility which will be exercised by the new civilian space agency and that which will be exercised by the Department of Defense. The House and Senate language differed considerably in approach but not in intent, and both provisions suffered from what the

11. Classified scientific material does not exist for the many scientists who do not work on Government contracts.

(6) *Dr. H. Guyford Stever*, associate dean of engineering, Massachusetts Institute of Technology, chairman, National Advisory Committee on Aeronautics, Special Committee on Space Technology (pp. 389–400), had the following to say about the type of organization which would best handle the problems of astronautics and space exploration:

> Without going into great detail about all the possible organizations proposed to do this job, let me say that, for several reasons, I favor the use of the NACA as a nucleus of a new organization to conduct our nonmilitary work in astronautics and space exploration. In the first place, the NACA laboratories have already done, and are continuing to do, a great deal of work in this field, particularly on the flight techniques. In the second place, NACA's relationship with the National Science Foundation and the National Academy of Sciences is such that they can use the important scientific research capabilities which these two organizations have. In the third place, NACA has longstanding close relationships with the military; there is a great overlap in the military and the nonmilitary uses of equipment for space exploration and experimentation. The new organization can use these well-founded relationships, first, to help the military solve its problem, and, second, to help itself by using military equipment.
>
> It is important to consider this a new organization rather than an expanded NACA, for it must have a capability to contract with industry and academic institutions to perform sizable portions of this program. The NACA does not do this at the present time to the extent that will be necessary in this new activity.
>
> Finally, there is one important point which is fundamental to this entire operation. It has to do with the decentralization of authority and responsibility, once the program is decided upon. In those stages in which we are now, essentially, discovering what our objectives are, what our organization should be, and what general program should be followed, I think it is important to tap all of the ideas from all sources. As we begin to carry out this program, we must continue to tap these ideas from capable organizations and individuals to find out what scientific experiments to perform, and to discover what techniques we should use to carry out scientific experiments into space. But, having decided upon an experiment or a program of experiments, I believe it is essential that responsibility and authority be delegated down to the working, technical level. A very complicated superstructure of detailed technical management within the Government, I believe, has seriously hampered some of our most important projects in space technology to date.
>
> I believe that the leaders within the NACA understand this fundamental requirement for rapid progress in a technical venture.

programs of committees but, rather, it adds to and greatly expands the role of each. In fact, if our blueprints are proper and our building adequate, we should assure that after this period of transition there will be a diminished need for special agencies and special committees to deal with space.

Space affects all of us and all that we do, in our private lives, in our business, in our education, and in our Government. We shall succeed or fail in relation to our national success at incorporating the exploration and utilization of space into all aspects of our society and the enrichment of all phases of our life on this earth.

(2) *Wilber M. Brucker*, Secretary of the Army (pp. 215–236), told of the immensity of the task involved in forging ahead and maintaining indefinitely a commanding lead in the scientific and technological progress leading to development of outer space. His views on the legislation were summarized as follows:

I concur in the concept that the National Aeronautics and Space Agency should be a civilian agency with Department of Defense representation. Such military representation is particularly important to the overall success of NASA since within the Department of Defense programs are to be found most of the talent, and most of the physical assets which are necessary to the immediate programs which would be carried on by the NASA. The NASA, therefore, will have major dependence upon the Department of Defense for a long time to come.

As set up under S. 3609, the Advisory National Aeronautics and Space Board would consist of not to exceed 17 members, at least 1 to represent the military interest, and the rest concerned with the civilian interest. It seems clear to me that whatever the composition of the Advisory Board may be, fully adequate military liaison will be established and maintained with the working group of the Agency to the end that military requirements are given adequate consideration.

I believe the Department of Defense should be assured the same working relationship with the proposed NASA as with the National Advisory Committee on Aeronautics. I see no major problems in establishing effective cooperation between the National Aeronautics and Space Agency and the Department of Defense, particularly since Department of Defense responsibility is now centered in the Advanced Research Projects Agency. However, it is possible that the bill now under consideration could be interpreted so as to restrict unduly the activities of the Department of Defense in the astronautics and space field. It is frequently difficult to determine as we embark on so vast and unknown an enterprise as space exploration just what facets of this exploration will have application to weapons systems and military operation. I do not believe it to be the intent of the administration or of the Congress to prohibit research in this area by the agencies of the Department of Defense.

The legislative line should not be drawn too sharply between what the Department of Defense and its agencies can

It provided for the transfer of the functions, powers, duties, property, and personnel of the National Advisory Committee for Aeronautics to the Administration, and authorized the President during the next 4-year period to transfer to the Administration any function of any other department or agency which relates primarily to the functions, powers, and duties of the Administration.

Section 305 relating to patent rights (the full text of which appears in appendix B, infra) provided in substance as follows: (a) An invention made under Administration contract shall belong to the Administration (1) in the case of research employment, where it relates to such research, is within the inventor's duties, or involves Government facilities, time, etc., and (2) in the case of nonresearch employment, where it relates to the inventor's duties and involves Government facilities, time, etc. (b) Administration contracts shall require contractors to report any inventions made in the performance thereof. (c) No patent may issue (except to the Administrator) on inventions useful in conducting aeronautical and space activities unless the applicant files a statement with the Commissioner of Patents of the circumstances of the invention and the relation, if any, to work under Administration contract. (d) Any patent on an invention referred to in subsection (c) shall issue to the Administrator on his request unless the Board of Patent Interference, to which the applicant may refer the matter, concludes that the latter is entitled to it. (e) Any patent issued to applicant under subsection (d) as a result of misrepresentation by him may be assigned to the Administrator upon proceedings, as prescribed, brought in the Patent Office. (f) The Administrator may waive rights in any invention upon determination that "the interests of the United States will be served thereby," but subject to a free nonexclusive license for the United States (and foreign countries pursuant to treaty); proposals for such waiver to be made to an Inventions and Contributions Board which, after hearings, shall make recommendations to the Administrator with respect thereto. (g) The Administration shall set the terms and conditions for licensing patents held by it. (h) It shall take suitable action to protect inventions it owns and require others to protect those under which it is licensed. (i) The Administration is classified as a defense agency for purposes of chapter 17 of title 35. (j) Definitions.

Section 306 relating to "contributions awards" (the full text of which appears in appendix B, infra) provides as follows: (a) The Administration may make monetary awards to persons making scientific or technical contributions of significant value in aeronautical and space activities; the Inventions and Contributions Board, after hearings, shall make recommendations to the Administration; factors to be considered are: (1) value of the contribution, (2) development expenses of the applicant, (3) compensation previously received, and (4) other factors. (b) If there is more than one applicant for the same contribution, the Administration shall make or apportion the award in such manner as it deems equitable; the conditions of the award are (1) that applicant surrender all claims against the United States (or foreign countries pursuant to treaty) and (2) a $100,000 maximum, except that a larger award may be made if submitted to Congress and the latter does not object within 30 days.

the original term of which remains unexpired at the time of filing * * *.

* * * * *

(F) The period of extension * * * shall in no case exceed a further term of three times the length of his said service in the military or naval forces * * *.

b. Hearings and significant testimony

Hearings were held before the House Committee on Patents on March 23 and April 13, 1928, on H.R. 10435.

Testifying in favor of the legislation were representatives from the American Legion and the Disabled Veterans.

(1) *Col. John Thomas Taylor*, National Legislative Committee, American Legion (pp. 2–7), explained his reasons for favoring the bill as follows:

> This bill won't cost the U.S. Government a single penny. We contend that when this Government granted a patent to these men, the Government entered into a quasi contract with them for a period of 17 years. Then along came the war and there was a bigger contract, a much bigger contract, and the Government reached over and just took these men and put them in the service. The second contract that the Government entered into with the men, the contract for them to perform military service, interfered with this first contract to such an extent that they were not able to develop the possibility of making some money out of their patents.

(2) *James F. Smathers*, Legionnaire (pp. 15–20), told of his own experience of loss on his invention.

> In 1913 I secured a patent and my means were very limited and I had to work a while and pay a modelmaker, then work a while again. So the years went by and I got a model built and was just about to make some arrangements for marketing it, or planning at least for marketing it, when the war came on. * * *
>
> I went into the Army in November 1917, went overseas and was brought back home and discharged in June 1919, approximately 21 months after entering the Army. I had borrowed money and had made fair arrangements for carrying on my development work before I joined the Army. When I came back all those financial plans were disrupted; the banks knew I did not have anything and I could not resume my borrowing from them, as I had done prior to the time I went away. So I first had to turn in and work for a year or two to revamp my bank account before I could even start to make models, and in about 1921 I was able to get another model done and to start again along the course of planning and marketing my invention, and in 1923 I succeeded in making arrangements whereby a manufacturing concern took over the engineering and development work.
>
> Mr. LANHAM. In other words, but for your service in the war you could have brought this up to the point that you did in 1923 at a much earlier date?

and the Division of Medical Sciences has studied the after effects of the atomic bomb explosions in Japan.[88]

The U.S. National Committee for the International Geophysical Year was established by the Academy-Research Council. The Council also assumed direction of the United States World Data Center.[89]

The achievements reported above show only a few of the research projects and activities undertaken by the National Research Council, in carrying out the aims prescribed for it in its "Articles of Organization":

> It shall be the purpose of the National Research Council to promote research in the mathematical, physical, and biological sciences, and in the application of these sciences to engineering, agriculture, medicine, and other useful arts, with the object of increasing knowledge, of strengthening the national defense, and of contributing in other ways to the public welfare, as expressed in the Executive Order of May 11, 1918 (art. I).[90]

VII. NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

On October 1, 1958, the National Advisory Committee for Aeronautics was absorbed into the new National Aeronautics and Space Administration, and its independent existence came to an end.

A. BILLS PROPOSING RESEARCH IN AERONAUTICS—PRIOR TO 1915

Although proposals for an Advisory Committee for Aeronautics were not introduced until 1915, three bills prior to that date provided for research in aeronautics.

S. 8402 (Mr. Stone) and H.R. 28679 (Mr. Peters), were introduced in the 62d Congress on February 7, 1913.

S. 8402 and H.R. 28679 proposed establishment of a National Aeronautical Laboratory which was to be under the supervision of the Board of Regents of the Smithsonian Institution (sec. 1). Section 2 set forth the duties of the Laboratory as follows:

> That the functions of the Laboratory shall be the study of the problems of aeronautics, with such research and experimentation as may be necessary to increase the safety and effectiveness of aerial navigation for the purpose of commerce and national defense.

The Laboratory was to work for the Government and also for private concerns, who would pay the costs of the research (sec. 3); it was to make public the results of its experiments through "bulletins for public distribution" (sec. 7). Section 8 established an aeronautical committee, composed of the Laboratory's director, an aeronautical officer from the War Department and one from the Navy Department, the Secretary of the Smithsonian Institution, the Chief of the Weather Bureau, the Chief of the U.S. Bureau of Standards, and seven other persons acquainted with the field, three of whom were to be from

[88] British Commonwealth Scientific Office, North America. Notes on science in U.S.A. 1954, pp. 4-5 (London, Her Majesty's stationery office, 1955).
[89] National Science Foundation, Eighth Annual Report, 1958, pp. 93, 94.
[90] Quoted in consolidated report upon the activities of the National Research Council 1919-32, p. 9.

On April 2, 1958, President Eisenhower's message to the Congress (H. Doc. 365) relative to space science and exploration proposed the establishment of a strong civilian agency, with the National Advisory Committee for Aeronautics as its nucleus, to direct a national program for outer space. This message read, in part:

> Recent developments in long-range rockets for military purposes have for the first time provided man with new machinery so powerful that it can put satellites into orbit, and eventually provide the means for space exploration. The United States of America and the U.S.S.R. have already successfully placed in orbit a number of earth satellites. In fact, it is now within the means of any technologically advanced nation to embark upon practicable programs for exploring outer space. The early enactment of appropriate legislation will help assure that the United States takes full advantage of the knowledge of its scientists, the skill of its engineers and technicians, and the resourcefulness of its industry in meeting the challenges of the space age.
>
> During the past several months my Special Assistant for Science and Technology and the President's Science Advisory Committee, of which he is the Chairman, have been conducting a study of the purposes to be served by a national space program, of the types of projects which will be involved, and of the problems of organizing for space-science functions. In a statement which I released on March 26, 1958, the Science Advisory Committee listed four factors which in its judgment give urgency and inevitability to advancement in space technology. These factors are (1) the compelling urge of man to explore the unknown; (2) the need to assure that full advantage is taken of the military potential of space; (3) the effect on national prestige of accomplishment in space science and exploration; and (4) the opportunities for scientific observation and experimentation which will add to our knowledge of the earth, the solar system, and the universe.
>
> These factors have such a direct bearing on the future progress as well as on the security of our Nation that an imaginative and well-conceived space program must be given high priority and a sound organization provided to carry it out. Such a program and the organization which I recommend should contribute to (1) the expansion of human knowledge of outer space and the use of space technology for scientific inquiry, (2) the improvement of the usefulness and efficiency of aircraft, (3) the development of vehicles capable of carrying instruments, equipment, and living organisms into space, (4) the preservation of the role of the United States as a leader in aeronautical and space science and technology, (5) the making available of discoveries of military value to agencies directly concerned with national security, (6) the promotion of cooperation with other nations in space science and technology, and (7) assuring the most effective utilization of the scientific and engineering resources of the United States and the avoidance of duplication of facilities and equipment.

Committee on the Transit of Venus, 1871.
Committees on the Restoration of the Declaration of Independence, 1880, 1903.
Committee on the Inauguration of a Rational Forest Policy for the Forested Lands of the United States, 1896.

The number of Government requests decreased somewhat after 1888 and it is important to note that although science was becoming increasingly important, research in later years was being carried on not only by the National Academy, but also by many new scientific organizations. The necessity of coordinating the research of these groups and that of the National Academy was largely met by the founding of the National Research Council,[73] considered infra.

B. THE NATIONAL RESEARCH COUNCIL

1. ESTABLISHMENT

The National Research Council was not established by congressional legislation, but was created as a result of President Wilson's acceptance in April 1916 of an offer by the National Academy of Sciences to bolster America's scientific strength in the light of the impending war. On June 19, 1916, the National Academy of Sciences approved the plan of its Committee on Organization and urged: [74]

> That there be formed a National Research Council, whose purpose shall be to bring into cooperation existing governmental, educational, industrial, and other research organizations with the object of encouraging the investigation of natural phenomena, the increased use of scientific research in the development of American industries, the employment of scientific methods in strengthening the national defense, and such other applications of science as will promote the national security and welfare; (and)
>
> That the Council be composed of leading American investigators and engineers, representing the Army, Navy, Smithsonian Institution, and various scientific Bureaus of the Government; educational institutions and research endowments; and the research divisions of industrial and manufacturing establishments.

President Wilson accepted the plan on July 24, 1916. The National Research Council met for the first time on September 20, 1916, and for 2 years it served the military needs of the country. On May 11, 1918, it was given a more permanent status by Executive Order No. 2859 issued by President Wilson.[75] The order stated:

> The National Research Council was organized in 1916 at the request of the President by the National Academy of Sciences, under its congressional charter, as a measure of national preparedness. The work accomplished by the

[73] Detlev W. Bronk, News Report, National Academy of Sciences, National Research Council, vol. 1 (January–February 1951).
[74] "Preliminary Report of the Organizing Committee," proceedings, National Academy of Sciences, vol. 2, p. 508 (August 1916). (Quoted in National Research Council Consolidated Report upon the "Activities of the National Research Council, 1919–32," pp. 5–6, prepared in the Office of the Permanent Secretary with the assistance of the Chairman of Divisions of the Council (Washington, 1932).)
[75] "Consolidated Report Upon the Activities of the National Research Council 1919–32," pp. 6–7.

PART 3. PATENT EXTENSIONS

I. HISTORICAL BACKGROUND

In the early days of this country, a considerable number of patents were extended both by special act of Congress and, for a time, by the Patent Office. Between 1809 and 1887, 37 special acts were enacted by Congress, extending the patents of various individuals. Since 1887, only one patent has been similarly extended, to wit, the "Ronson lighter" patent which was extended in 1944 under some unusual circumstances, discussed infra. A table listing these 38 special acts is set forth in appendix C.

Prior to the act of 1836, the power to extend patents was lodged in Congress. At that time, the term of the patent was 14 years and no more. In 1836, jurisdiction over the renewal as well as the first issue of letters patent was conferred upon the Patent Office, subject to numerous restrictions as to the grounds of renewal and the duration of the extended term. The term of 14 years was retained in the act of 1836, but the provision for the extension was 7 years.

By the act of March 2, 1861,[111] this jurisdiction over extensions was withdrawn as to all patents granted after the passage of that act, and Congress thereby became the only source from which an increase of the monopoly created by future patents could be obtained. At the same time, however, the act of 1861 extended the term of patents to 17 years.

This act had its origin in Senate bill No. 10. It repealed section 5 of the act of 1836, which had fixed the term of a patent at 14 years, and section 18 of the same act, which had provided for an extension of the original term for a period of 7 years. This bill, in the form in which it passed the Senate, contained no provision for either extending the term of a patent or for repealing or modifying section 18 of the act of 1836. The House, however, amended the bill by adding a section which read as follows:

> * * * there shall be no further extension of any patent when it shall appear to the Commissioner that the profits of said patent, including sales made by the assignee or assignees of said invention, shall amount to one hundred thousand dollars.

The Senate disagreed with the House provision as to assignees, on the ground that the assignees might be unable or unwilling to give an accounting, and that the inventor could not compel them to do so. The bill then went to a conference committee. Up to this time it had not contained any provision either to change the duration of patents or to repeal the law providing for their extension. The conference committee struck out the entire section, and substituted the short one, which stands as section 16 of the act, reading as follows:

> That all patents hereafter granted shall remain in force for the term of seventeen years from the date of issue; and all extension of such patents is hereby prohibited.

[111] 12 Stat. 246 (1861).

"These men (scientists) have a natural—and historically by no means groundless—apprehension that Federal subsidy can be a serious threat to the academic independence that higher education has always guarded so jealously."

(5) A formula for the distribution of research funds which is unduly restrictive.

(6) Patent provisions which do not belong in a measure of this nature.

(7) Patent provisions which because of their nature virtually might confiscate a form of private property.

(8) Patent provisions which because of their complex language provide much uncertainty as to what the law might be.

(9) Patent provisions which because of their tenor might well tend to discourage rather than encourage private initiative.

The reasons for approving certain features and disapproving others, as above enumerated, are set forth in our main statement.

(9) *William C. Foster,* Under Secretary of Commerce (pp. 171–177), declared:

> 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. 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 * * *.
>
> * * * 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.

(10) *Randolph T. Major,* director of research and development, Merck & Co. (pp. 177–181), supported establishment of a Foundation as proposed in the four bills, but did not favor enactment of the Celler bill. He preferred a board to a single administrator. He disapproved the inclusion of social sciences. As for the patent provisions, he said:

> I think that it would be particularly undesirable to tack on to the Science Foundation bill a rider proposing to make drastic changes in the patent policies of all Government agencies as is attempted in the Celler bill (H.R. 942).

(11) *Robert M. Yerkes,* emeritus professor of psychobiology, Yale University, chairman of Committee on the Federal Government and Research, Social Science Research Council (pp. 182–191), gave reasons why the Foundation would need a broad scope. He listed some of the important issues to be studied as follows:

> (1) Labor-management relations—problems of man versus machine in a highly industrialized free-enterprise system; (2) population control—quantity, migrations, immigration; (3) taxation—which bristles with social and other biological

closure of a new and useful invention, society grants to him the right to practice it (if he can also overcome these hurdles) and exclude others from so doing, for an intended period of 17 years. He delivers his part of the contract; he naturally expects society to do the same. Having overcome these hurdles he has the right to expect that society itself will not interpose unexpected hurdles of its own, to interfere with what returns he can derive from his efforts at invention. If, however, society itself does interfere with his exploitation of the invention for any portion of that 17-year period, the inventor is in the position of one who has delivered his part of a contract and finds himself shortchanged by the other party to the bargain.

(4) *Paul A. Rose*, chairman, committee on laws and rules, American Patent Law Association (pp. 93–102), said that the American Patent Law Association was opposed in principle to the extension of the terms of patents as proposed in the bills under consideration. Such extensions, he stated, were not believed to be in the public interest or in the interest of the patent system in this country. They were also contrary to the established policy of the Congress against extension. The proper remedy, according to the association, would be by way of special legislation restricted to individual patents, rather than general legislation.

These bills were not reported out of committee, and no further action was taken on them.

2. OTHER BILLS INTRODUCED IN THE 82D CONGRESS

H.R. 3231, March 14, 1951 (Mr. Davis of Wisconsin).
H.R. 7394, April 4, 1952 (Mr. Budge).
H.R. 7552, April 23, 1952 (Mr. Magnuson).
S. 1986, August 9, 1951 (Mr. Dirksen).
S. 3096, May 1, 1952 (Mr. Dworshak).

No hearings were held on any of these bills and they received no further action.

3. BILLS INTRODUCED IN THE 83D CONGRESS, UPON WHICH HEARINGS WERE HELD

a. Provisions

H.R. 1228, January 7, 1953 (Mr. Budge). It proposed to amend the act of June 30, 1950, to allow an extension to "persons, firms, or corporations as coowners of patents." This would increase the coverage of the law, which at that time allowed an extension to the inventor-veteran only if he were sole owner of the patent or coowner with his wife.

H.R. 1301, January 7, 1953 (Mr. Reed). This bill was similar to H.R. 323 (82d Cong), described supra, p. 164.

H.R. 2309, January 29, 1953 (Mr. Scott). It contained the following provisions:

(a) it is the policy and purpose of this act to provide for the extension of the term of any patent where—

(1) to further the interests of the United States of America, the owner of such patent has heretofore granted

award the Government title to patents developed with the use of Government funds would, in any way, infringe upon this right.

Perhaps some may think that this oversimplifies the matter but I have long felt that the patent provisions of the many laws surrounding Government research work could be simplified to a greater extent.

I do feel strongly that no provision of the law setting up the Space Agency should ever be construed to confer on any individual a right which could in any way impede or restrict the use of relevant technology by our Government for domestic or for international purposes. An unequivocal statement to this effect in the law would be an earnest of our intention to help other nations.

I hope these comments are of help to you.

Sincerely yours,

H. G. RICKOVER,
Rear Admiral, U.S. Navy.

(3) *Rear Adm. John T. Hayward,* Assistant Chief of Naval Operations (Research and Development) (pp. 274–306), agreed with the need for a comprehensive program of research in space sciences and a national space program.

He commented briefly on the Soviet system of awards, saying:

> They also have competition in designs and incentives. The results of people like Djurvich and Alushkin, who have won the Lenin prize four or five times; and that is $3,500 tax free in our country's money.
>
> Of course, they do have a double incentive, as Admiral Rickover said; they either produce or get shot. If they produce, they are rewarded. If they do not, they get shot.

(4) *Dr. John P. Hagen,* Director of the Vanguard Project, Naval Research Laboratory (pp. 307–367), began his testimony as follows:

> It is a great opportunity for me to be here to talk with the committee concerning this bill. I think the work of this select committee arises because the Russian satellite accomplishments brought into focus, and into the public eye, the Soviets' determined national effort and singleness of purpose not only to lead the world in the arts of weaponry, including ballistic missiles, but to base this effort on a broad foundation of education, research, and science and technology with the very obvious purpose of outstripping and perhaps dominating she world we know and the world that is to come. It is also obvious that the Russians have a plan for doing this and are dedicated to the task.
>
> * * * * *
>
> However, before we figuratively leap into space we must learn well the lessons of the past, carefully examine our present needs and bring our resources forward with purpose and utilize them wisely to their maximum potential.
>
> We should revitalize the free spirit of inquiry which is so essential to our democratic way of life. We should investigate rather than fear the unknown and allow freer range of

outer space be devoted to peaceful purposes, and that the exploration of space be so conducted as to promote world peace. (2) While keeping control in a straight-line civilian organization formed around the NACA as a nucleus, with authority and responsibility vested in a single Administrator assisted by an Advisory Committee, the bill sought to assure maximum cooperation and exchange of scientific and technical ideas and information between civilian and military organizations by providing for (a) such cooperation on all matters involving both peaceful applications and military requirements; and (b) freedom for the military department to conduct such basic and applied research and development as may be necessary and appropriate to their military missions.

To accomplish these purposes, the civilian agency was directed, and not merely authorized, to cooperate with the Department of Defense—and also with the Atomic Energy Commission and other departments and agencies concerned. In describing the field of cooperation, the committee kept the language of the previous bill—"peculiar to or primarily associated with weapons systems or military operations"—but broadened it by adding: "or the defense of the United States (including the research and development necessary for the defense of the United States)."

Other important changes are summarized in the committee report as follows (pp. 7–8):

> (3) As to matters of organization, the bill provides not only for an Administrator but for a Deputy Administrator (both appointed by and with the advice and consent of the Senate) and for a General Counsel. It further provides for divisions on military and nuclear application respectively, and for such other divisions as the Administrator finds necessary.
>
> (4) The bill establishes a Military Liaison Committee, similar to that of the Atomic Energy Commission, and also an Atomic Energy Liaison Committee. The Chairmen of these Committees would be appointed by the President. Other members would be assigned by the Secretary of Defense and the Atomic Energy Commission respectively.
>
> In effect, the Military Liaison Committee provides the machinery for carrying out the policy of civilian control and civilian-military cooperation.
>
> (5) The composition of the 17-member Advisory Committee has been changed. The bill provides that 9 members, rather than a maximum of 8, shall be appointed from appropriate departments and agencies of the Federal Government, and that a minimum of 3, rather than 1, shall be from the Department of Defense. In making this change, also recommended by the administration at a late stage, your committee's thought was that the Advisory Committee would perform liaison and coordinating, as well as advisory, functions within the Federal Government. Four-year terms are stipulated for the members, except that the President may make initial appointments for shorter terms.
>
> In the previous bill (which designated the head of the Agency as the Director), the Director was required to consult the Board (as it was then designated), though not to take

A Board of 24 members was to be selected solely on the basis of established records of distinguished service, and to consist of persons eminent in the fields of the sciences, etc.

The Director of the Foundation shall be appointed by the President, with the advice and consent of the Senate. The Board may make recommendations to the President with respect to his appointment, and the Director shall not be appointed until the Board has had an opportunity to make such recommendations. The Director should exercise powers in accordance with the policies established by the Board. The Board must review and approve actions taken by him.

The divisions within the Foundation are to be: (1) Division of Medical Research; (2) Division of Mathematical, Physical, and Engineering Sciences; (3) Division of Biological Sciences; and (4) Division of Scientific Personnel and Education, which shall be concerned with programs of the Foundation relating to the granting of scholarships and graduate fellowships in the mathematical, physical, medical, biological, engineering and other sciences. The Board may establish such other divisions as it deems necessary.

Scholarships and fellowships are to be given solely on the basis of ability, but in cases of two equally qualified applicants and one scholarship, it will be awarded so as to achieve the widest geographical distribution.

In the case of patent rights, each contract shall contain provisions governing the disposition of inventions 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 made, provided that the Foundation shall not enter into any arrangement inconsistent with the patent law. No employee may retain rights under the patent laws to any invention he makes during performance of his duties with the Foundation.

H. 83D CONGRESS (1953–54)

1. BILLS INTRODUCED (S. 977 AND H.R. 4689)

S. 977 (Messrs. Smith (N.J.) and Aiken) was introduced February 18, 1953; and H.R. 4689 (Mr. Wolverton), identical to S. 977, was introduced April 20, 1953. They called for amendment to the National Science Foundation Act as follows:

(1) By striking from subsection (d) of section 4 the sentence "A majority of the voting members of the Board shall constitute a quorum" and inserting in lieu thereof the sentence, "Eight of the voting members of the Board shall constitute a quorum."

(2) By striking from subsection (a) of section 16 the words "not to exceed $500,000 for the fiscal year ending June 30, 1951, and not to exceed $15,000,000 for fiscal years thereafter" and inserting in lieu thereof the words "such sums as may be necessary to carry out the provisions of the Act."

Hearings were held by the House Committee on Interstate and Foreign Commerce and by the Senate Committee on Labor and Public Welfare. S. 977 was reported out on July 11, 1953 (S. Rept. 396), and H.R. 4689 on May 11, 1953 (H. Rept. 374), both with amendments. S. 977 was passed in the Senate on June 13, 1953. It was passed in the House, in lieu of H.R. 4689, on August 3, 1953.

S. 977 became Public Law No. 223 on August 8, 1953.

In 1836 the U.S. Congress passed a bill providing that the President through agents should "assert and prosecute" a case in the English Court of Chancery for this country's right to the Smithson legacy. Section 3 of this act of July 1, 1836, stated:

> And be it further enacted, that any and all sums of money, and other funds, which shall be received for, or on account of, the said legacy, shall be applied in such manner as Congress may hereafter direct, to the purpose of founding and endowing at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of knowledge among men; to which application of the said moneys, and other funds, the faith of the United States is hereby pledged.

The United States received the legacy on September 1, 1838. On December 10, 1838, President Van Buren urged congressional attention to the fact that no effort had been made to use the fund for an institution. Thereafter, many legislative proposals were made concerning the best way of achieving "the increase and diffusion of knowledge among men." These bills for the establishment of the Smithsonian Institution will be considered here.

B. BILLS PROPOSING ESTABLISHMENT OF THE SMITHSONIAN INSTITUTION (1839–1845)

1. S. 292, REPORTED FEBRUARY 18, 1839 (MR. ROBBINS); H.R. 1161, REPORTED FEBRUARY 16, 1839 (MR. JOHN QUINCY ADAMS)—25TH CONGRESS

The Senate and the House of Representatives in January 1839 passed a resolution setting up a joint committee on the Smithsonian bequest.[52] S. 292 and H.R. 1161, which were reported from this committee, provided for administration of the Smithsonian fund by nine trustees, who were "to prepare * * * a charter of incorporation, and * * * a plan of an institution for the increase and diffusion of knowledge among men." The bills included no directives as to the type of institution.

On February 25, 1839, S. 292 was laid on the table by a vote of 20 in favor and 15 opposed.[53] No action was taken on H.R. 1161.

2. S. 293, REPORTED FEBRUARY 18, 1839 (MR. ROBBINS); H.R. 1160, REPORTED FEBRUARY 16, 1839 (MR. ADAMS)—25TH CONGRESS

S. 293 and H.R. 1160, which were reported from the joint committee, called for the establishment of a board of trustees for the Smithsonian fund and provided:

> And be it further enacted, that no part of the said Smithsonian fund, principal or interest, shall be applied to any school, college, university, institute of education, or ecclesiastical establishment (sec. 4).

Only the interest from the Smithsonian fund was to be spent for the institution (sec. 5), and $30,000 was to be used for the establish-

[52] Congressional Globe, 25th Cong., 3d sess., pp. 113, 115.
[53] Id. at p. 216.

accordance with Mr. Mellon's terms. In the House of Representatives hearings were held on House Joint Resolution 217 on February 17, 1937, before the Committee on the Library.[66] The Senate Committee on Public Buildings and Grounds held hearings on Senate Joint Resolution 73, a similar resolution, on February 19, 1937.[67] The same persons testified before both committees, and the testimony given was favorable to the legislative proposals.

The act of March 24, 1937, which established the National Gallery of Art, was almost identical to House Joint Resolution 217 and Senate Joint Resolution 73. Section 1 of the act gave the site on the Mall to the Smithsonian Institution and provided for the building of the gallery by the A. W. Mellon Educational and Charitable Trust. Section 2(a) set up a Smithsonian Bureau under the control of a Board, the trustees of the National Gallery of Art. This Board consisted of the Chief Justice, the Secretaries of State and the Treasury, the Secretary of the Smithsonian Institution, ex officio, and five private citizens. The Board was to appoint a director, an assistant director, a secretary, and a chief curator (sec. 4(c)) and was to be responsible only to the courts (sec. 4(d)). Section 5(b) provided for carrying out Mr. Mellon's intention of maintaining a high quality of works in the gallery. The Board was to make an annual report to the Smithsonian Institution (sec. 5(d)). Section 6(c) stated that the existing National Gallery of Art would be called the National Collection of Fine Arts.

d. Smithsonian Gallery of Art

The Smithsonian Gallery of Art was established by the act of May 17, 1938. Section 1 provided for land for housing its collections. Section 3(c) stated that the gallery would be "under the supervision and control of the Regents and the Secretary of the Smithsonian Institution." Section 4(a) expressed the purposes and the functions of the gallery, which included maintaining a high standard of art objects for exhibit.

Section 4(b) contained an unusual provision reading as follows:

> (b) In order to encourage the development of contemporary art and to effect the widest distribution and cultivation in matters of such art, the Regents are hereby authorized to solicit and receive funds from private sources, to acquire (by purchase or otherwise) and sell contemporary works of art or copies thereof, to employ artists and other personnel, award scholarships, conduct exhibitions, and generally to do such things and have such other powers as will effectuate the purposes of this subsection.

Section 5 provided that works of art from certain other sections of the Government were to be given to the gallery. Section 6 stated that the Regents and Secretary of the Smithsonian Institution were to approve the gallery exhibitions. A Director of the gallery and other officers were to be appointed by the Regents (sec. 7), and Congress was to make annual appropriations for administration of the gallery (sec. 8).

[66] Id. at p. 54.
[67] 75th Cong., 1st sess. (1937).

new device he could go to the Office for help and guidance in completing the development of his idea and in making proper arrangements for its exploitation by industry.

The principal amendments were designed to overcome objections brought out in the hearings that (1) the administrative burden involved in providing an evaluation of the invention might take more time and money than the result justified; (2) the provisions for fixing and sharing royalties might prove difficult to administer; and (3) competition with patent attorneys might result.

A fee of $10 was established to safeguard the Office against a large volume of trivial requests. In return for the fee, the inventor would secure a public recording which would furnish him some protection against other persons claiming to have originated the idea prior to the time the patent was issued.

The problem of the establishment and sharing of royalties was overcome by providing that ownership should be retained by the inventor. However, if the idea were practicable and would result in large public benefits, and if it could not be privately developed and marketed, the Government might make an advance to the inventor of not more than $1,500 for further development and, if necessary, might undertake full development in Government laboratories. In addition, an advance might be made to the inventor for the expense of obtaining a patent. In exchange for such assistance the inventor would agree with the Government to make the patent available for use on a nonexclusive license basis and to repay advances made by the Government out of royalties on such licenses.

The objection to possible competition with private patent attorneys was overcome by leaving the inventor free to employ his own attorney for the purpose of taking out patents.

d. Debates in Congress

S. 1248 was debated in the Senate on March 1, 1946. Senators Mead and Fulbright described the benefits of S. 1248 (Congressional Record, p. 1818). Senator Taft objected to the bill, saying that it was "exceedingly broad." By authorizing the Secretary of Commerce—

> to undertake engineering or technological research on industrial, commercial, or related problems of an important general nature, including the development of such inventions, products, and processes as may be qualified for future utilization—

he felt that the bill was broad enough to include all basic research and certainly broad enough to include intermediate basic research. He suggested that this bill could be included in the National Science Foundation bill. He took the position that the initiation and sponsorship of engineering or technological research or development in private or nonprofit institutions should be the responsibility of a single agency; that the Congress should decide which one should do it and not approach the subject piecemeal.

Senator Mead emphasized the great benefits this bill would have to small business (pp. 7935–7938). He said that small business would "starve at the roots" if it could not make use of the fruits of

Both S. 259 and S. 224 were reported from the Committee on the Library, but no further action was taken on S. 259. S. 224 was considered in the Senate on July 18, 1842, and ordered to lie on the table.[56]

7. S. 188, REPORTED JUNE 7, 1844 (MR. TAPPAN)—28TH CONGRESS [57]

S. 188, which was reported from the Committee on the Library, set up a Board of Managers to govern the Institution (sec. 2) and did not contain any provision for an extensive library. The bill provided for grounds for horticulture and agriculture (sec. 3) and for the distribution of the agricultural products resulting from the Institution's experiments (sec. 8). Section 7 stated that there would be professors in those scientific subjects not commonly taught in universities.

No action was taken on S. 188.

8. S. 18, DECEMBER 12, 1844 (MR. TAPPAN)—28TH CONGRESS

S. 18 also was similar to the act of August 10, 1846, infra, although it contained no specific appropriation for a library. It provided that the Institution should have the results of experiments and other scientific material published. Section 8 minutely prescribed the topics on which the professors would lecture.

S. 18 was reported from the Joint Committee on the Library without amendment on December 16, 1844.[58] On December 31, 1844, Senator Rufus Choate offered an amendment to the bill, which placed great emphasis on a library and made provision for the printing of certain lectures.

Discussion of S. 18 was held in the Senate on January 8 and 9, 1845.[59] On January 16, 1845, Senator Tappan reported to the Senate a substitute bill which provided for a large library containing works in all fields. Duscussion of this amended bill was taken up on January 21, 1845. Senator Levi Woodbury felt that the Smithsonian Institution should be under the control of the National Institute, and he proposed an amendment to that effect. The Woodbury amendment was rejected by the Senate (pp. 162–165) and on January 27, 1845, the Senate passed S. 18 (p. 179).

S. 18 was read in the House of Representatives on January 28, 1845,[60] and on February 10, 1845, Representative Robert D. Owen submitted an amendment which was quite similar to the bill but provided for a school for common schoolteachers. S. 18 was laid aside by the House on March 3, 1845.[61]

C. ACT OF AUGUST 10, 1846

1. H.R. 5, DECEMBER 19, 1845 (MR. OWEN)—29TH CONGRESS

H.R. 5 in its original form closely resembled the final bill (see infra), except that it contained provisions for a normal school (sec. 7) and for the publication of certain findings (sec. 10).

[56] Senate Journal, 27th Cong., 2d sess., p. 474.
[57] The congressional bills introduced and considered in the 28th and 29th Congresses closely approximated the Smithsonian bill as finally passed. For this reason only those provisions of the proposals which distinguish them from the final act are reported here.
[58] Congressional Globe, 28th Cong., 2d sess., p. 32.
[59] Congressional Globe, 28th Cong., 2d sess., pp. 105–107, 115–117, app. pp. 62–65.
[60] H.R. Journal, 28th Cong., 2d sess., p. 274.
[61] Congressional Globe, 28th Cong., 2d sess., p. 395.

He felt such a provision would be difficult to administer. His favorable comments included the following:

> I think there is a real and valuable service to be performed by assisting in the development of a complete technological library of reports and documents and by making these papers available on a national service basis; and that also a valuable service could be rendered by authorizing the Secretary of Commerce to enter into contracts, particularly with university engineering laboratories, to stimulate technological studies.

(5) *W. V. Lambert*, administrator, Agricultural Administration, Department of Agriculture (pp. 65–69), said:

> It is our feeling in the Department of Agriculture that the support of commercial development work, such as is proposed in bill S. 493, would be in the public interest, especially in the assistance it can give to small business and to inventors that are working independently and are not connected with large industrial plants.

He warned against overlapping with the work of the Department of Agriculture, whose patent policy differs from that in other Government agencies:

> In the Department of Agriculture, we have taken the position that we have at present no legal authorization for the employment of funds appropriated to us for any purpose that would result in profits to an individual, whether an inventor or not, rather than to the people of the United States as a whole.

(6) *Maj. Gen. Henry S. Aurand*, director of Research and Development Division, Chief of Staff, War Department (pp. 77–83), warned that the research of the War Department could not be continued behind closed doors. It must be a "two-way street" where information moves from the War Department to industry and vice versa. He told of the necessity of having ideas, data, reports, and articles readily available to researchers and inventors.

(7) *R. S. Pasley*, counsel, Office of Naval Research, Navy Department (pp. 84–95), described Navy procedure on patents. The Navy allows industry to keep patents on research which the industry, itself, had spent much time and money on.

Senator Hickenlooper suggested that the Government should get a modest royalty fee on its patents.

Mr. Pasley presented a statement of *Rear Adm. Paul F. Lee*, Chief of Naval Research, who said the Navy was in accord with the purpose of establishing in the Department of Commerce a clearinghouse for information aiding invention. His only concern was that it should not conflict with the National Science Foundation and other research programs. Also, he would not want a modification of the patent program followed by the Army and Navy.

(8) *J. E. Hobson*, director, Armour Research Foundation (pp. 96–104), said basic research should not be placed under Federal administration, but that tax laws should be amended so industry could be stimulated to increase the flow of funds to colleges and universities.

of technological information obtained from foreign and domestic sources which would be of value to American industry, particularly small businesses which have limited research facilities and technical staffs, and provide a needed reference source of technical information for the benefit of all American business; and (2) provide Government agencies and private persons with a procedure for recording technical developments of a marginal character, thus saving them the expense of filing defensive patent applications.

S. 868 passed the Senate on August 9, 1949 (Congressional Record, p. 9421).

c. Action, House

The House Committee on Interstate and Foreign Commerce reported out S. 868 (H. Rept. 2356), with amendments, on June 28, 1950, during the 2d session of the 81st Congress.

The major change was to strike out section 3, "Recording of Technical Developments," which provided for the voluntary filing and formal recording of scientific and technical data and provided for the issuance of a certificate which would be evidence as to the date of filing. The committee felt that its relationship to the patent laws was not clear and its consideration should be deferred.

Mr. Sabath, from the Committee on Rules, submitted another report (H. Rept. 2919) recommending passage of House Resolution 808 (similar to S. 868).

On August 28, 1950 (Congressional Record, p. 13634), the bill was debated in the House. Mr. Priest told of the hundreds of millions of dollars appropriated for Government research, the results of which are usually compiled in reports and are filed with the agency sponsoring the work. Even reports on nonclassified research, he pointed out, are filed away and rarely, if ever, reach the industrial community. He declared that if this information could be carefully cataloged and centrally recorded, both the Government and industry could use it and thereby avoid wasting time and money in fruitless duplication.

The committee amendments were agreed to and the bill was passed by the House, August 28, 1950 (Congressional Record, p. 13637).

The Senate concurred in the House amendment on August 31, 1950 (Congressional Record, p. 13940), and the bill was approved September 9, 1950, becoming Public Law 776.[50]

4. PUBLIC LAW 776 (81ST CONGRESS), SEPTEMBER 9, 1950

Public Law 776 provided for the collection and dissemination of scientific, technical, and engineering information through a central clearinghouse established in the Department of Commerce. The Secretary was directed to make such information available to industry and business, to State and local governments, to other agencies of the Federal Government, and to the general public. He was also to remove security restrictions in some cases. The Secretary was directed to refer all information of military value to the armed services.

IV. NATIONAL INVENTORS COUNCIL

The National Inventors Council was created in August 1940 by the Secretary of Commerce to receive, evaluate, and pass on to appro-

[50] 64 Stat. 823 (1950), 15 U.S.C. sec. 1151 (1952).

1850 was concerned with basic scientific research and his bill was concerned with its application. He said:

> This bill under consideration is designed to provide a means for American industry to make use of basic science and technology that may be developed by the proposed National Science Foundation—that is the one contemplated by the Magnuson-Kilgore bill—or from any other source. It has been called the applied sciences bill.

Senator Fulbright added that the section of the bill that provided for the establishment of a central technical office for dissemination of technological information and engineering data would render a great service to industry. He said:

> While the bill is primarily designed to aid small business, which is unable to maintain technical services and research organizations, it will enable all industry to keep its operations up to date without incurring an expense that is beyond the reach of the average business organization, and its records and facilities will be adapted to serve the Nation through the advancement of technological developments wherever possible of utilization.

He told of the difficulty the inventor has in introducing his invention and declared that this bill, S. 1248, would provide a service through which technological developments and new inventions could be properly analyzed and perfected to make them readily available to small industry, or to individuals who might wish to enter into new businesses.

Senator Fulbright said further that:

> The Office of Technical Services in the Department of Commerce would be authorized to procure the services of outstanding scientists, engineers, chemists, and other professional experts, to provide small enterprises with the best possible research facilities. Among the objectives of the bill is the stimulation of interest in research, the establishment of a central scientific and technical office to assure maximum use of all new inventions, and to give wide distribution to scientific developments and pertinent information, to compile all available research data for easy accessibility to inventors, research institutions, and business in general.

As to patents, he declared that the results obtained in research would become public property, other than to pay the inventor or patent holder a fair royalty, and would insure its widest possible utilization. To overcome any objections on the part of patent attorneys, he indicated that perfecting amendments had been proposed which would permit the Federal Government to assist an inventor to secure the necessary funds to procure a patent through an attorney of his own selection.

(2) *Hon. Henry A. Wallace*, Secretary of Commerce (pp. 14–22), told of the great need for development and dissemination of technical information. He said that both bills (S. 1850 and S. 1248) would pay enormous dividends to the country in the form of improved products, new industries, opportunities for investment and employment, and a higher standard of living.

III. OFFICE OF TECHNICAL SERVICES

A. BACKGROUND

An Office of Technical Services was established by Executive order during World War II.[49] It served as a clearinghouse for technical and scientific information needed by businesses and industry. Because of the importance of technological development in the success of individual businesses, it was found that there was need for such a program in peacetime.

However, in 1947 and 1948, the Department of Commerce's requests for appropriations to carry on this activity were stricken by the House of Representatives on points of order. The Senate authorized the appropriation, and it was included in the appropriation act as finally passed, but to avoid continued uncertainty as to authority for this activity and to facilitate the continued operation and planning of the program, the Department of Commerce asked that statutory authority be given.

B. BILLS INTRODUCED AND CONSIDERED, 1945–47

1. S. 1248, JULY 9, 1945 (ME. FULBRIGHT)—79TH CONGRESS

a. Provisions

S. 1248, as introduced by Senator Fulbright, would establish a Bureau of Scientific Research within the Department of Commerce. It would be the function of that Bureau to: (1) develop and act as a broker for inventions submitted to it; (2) support industrial research; (3) act as consulting engineer; and (4) act as a source of technological information.

To effectuate these purposes, the Bureau would—

(*a*) Examine and keep a record of all inventions, products, and scientific or technical processes submitted to the Bureau by any person for the purpose of determining their commercial possibilities.

(*b*) Develop through the facilities of the Bureau such inventions, products, and processes as are found qualified for future commercial utilization.

(*c*) Offer to the public for nonexclusive private exploitation, by qualified industries or individuals, such inventions, products, or processes as are determined fitted for private development.

(*d*) Provide for proper awards to be made to persons whose inventions, products, or processes are approved for private utilization.

(*e*) Collect, edit, publish, and disseminate pertinent data on all inventions and discoveries and other findings resulting from federally financed research and development activities.

Section 5 outlined the policy on patents:

> Any invention, product, or scientific process devised by any person, may be filed with the Bureau in such manner and

[49] Executive Order 9568, 10 Fed. Reg., p. 6917 (1945); Executive Order 9604, 10 Fed. Reg., p. 10960 (1945); Executive Order 9809, 11 Fed. Reg., p. 14281 (1945).

c. Reports

The Senate Committee on Labor and Public Welfare reported out S. 526 (S. Rept. 78) on March 26, 1947. The committee amended the bill as submitted in the Senate, but none of the essential features were changed. The committee found that S. 526 could accomplish the purposes of the legislation in a more democratic and less costly manner than S. 525.

d. S. 526—Debates in Congress and conference report

The debates in the Senate were very extensive, lasting 5 days, to wit, May 14, 15, 16, 19, and 20, 1947 (Congressional Record, pp. 5248–5260, 5324–5346, 5399–5481, 5498–5512).

Mr. Kilgore made an eloquent plea for passage of science legislation. In regard to patent provisions, he said:

> We have had a rather backward view of research. It has been purely commercial, dollar conscious, nickel conscious, penny conscious. We led the world in applied research and applied engineering; but we have taken from others—from Germany, from England, from France, and from Italy—the basic ideas. We talk about the atomic bomb. The principle of atomic fission was discovered long ago. We made a spectacular application of it. The people of the United States think that we have the secret of the atomic bomb, but actually its basic principles were discovered in Europe originally, and other principles far in advance of those may be discovered any day abroad and the application which we have made may become obsolete. This is best illustrated by the fact that one of the principal questions in connection with this bill is that of dollar application. The theory of the bill, as it now rests, is that it is a bill for scientists. I do not say, to produce scientists; I say, for scientists. It is a bill for patents? What are patents? Patents are property; they are property rights in the things that are developed. But the minute the U.S. Government undertakes to apply to inventions the same principles that are applied by every commercial company in the United States, hands are thrown up in holy horror, and it is said that the people, as stockholders in the corporation, should not apply those principles, that, if they do, they cannot get to work for them such scientists as those who work for companies X, Y, and Z.

As for education in basic research Mr. Kilgore said:

> Today we find ourselves at a blossoming period in the United States, devoid of most of our scientific students except those who were rated under a IV–F classification, those who are taking advantage of the GI bill of rights, and some who are endeavoring with their own private funds to get an education. We have lost at least 5 years, and we were woefully behind even before we lost those years. We were not keeping abreast of research. That is plainly evidenced by the fact that the country could afford to go into applied research only in the case of engineering work. Let me give

(2) the term "made", when used in relation to any invention, means the conception or first actual reduction to practice of such invention.

CONTRIBUTIONS AWARDS

SEC. 306 (a) Subject to the provisions of this section, the Administrator is authorized, upon his own initiative or upon application of any person, to make a monetary award, in such amount and upon such terms as he shall determine to be warranted, to any person (as defined by section 305) for any scientific or technical contribution to the Administration which is determined by the Administrator to have significant value in the conduct of aeronautical and space activities. Each application made for any such award shall be referred to the Inventions and Contributions Board established under section 305 of this Act. Such Board shall accord to each such applicant an opportunity for hearing upon such application, and shall transmit to the Administrator its recommendation as to the terms of the award, if any, to be made to such applicant for such contribution. In determining the terms and conditions of any award the Administrator shall take into account—

(1) the value of the contribution to the United States;

(2) the aggregate amount of any sums which have been expended by the applicant for the development of such contribution;

(3) the amount of any compensation (other than salary received for services rendered as an officer or employee of the Government) previously received by the applicant for or on account of the use of such contribution by the United States; and

(4) such other factors as the Administrator shall determine to be material.

(b) If more than one applicant under subsection (a) claims an interest in the same contribution, the Administrator shall ascertain and determine the respective interests of such applicants, and shall apportion any award to be made with respect to such contribution among such applicants in such proportions as he shall determine to be equitable. No award may be made under subsection (a) with respect to any contribution—

(1) unless the applicant surrenders, by means such as the Administrator shall determine to be effective, all claims which such applicant may have to receive any compensation (other than the award made under this section) for the use of such contribution or element thereof at any time by or on behalf of the United States or by or on behalf of any foreign government pursuant to any treaty or agreement with the United States, within the United States or at any other place;

(2) in any amount exceeding $100,000, unless the Administrator has transmitted to the appropriate committees of the Congress a full and complete report concerning the amount and terms of, and the basis for, such proposed award, and thirty calendar days of regular session of the Congress have expired after receipt of such report by such committees.

He preferred the Board and discussed his reasons for this preference. On patentable inventions he said:

> Now, the two bills are very different in their treatment of inventions made in the course of research supported by the Foundation. H.R. 1830 directs the Foundation, in making contracts and other arrangements for research, to consider the public interest and the equities of the research organizations and individuals with which it deals. It further provides, however, that no officer or employee of the Foundation shall derive any personal benefit from inventions which may be made by him in the course of performing his assigned activities for the Foundation. This, I believe, is as far as this legislation should go in controlling the policies of the Foundation. I believe that an able director, guided by this directive and by more detailed policies which would be established by the Foundation, would protect the public interest and, at the same time be fair to the individuals and organizations which will be performing research for the Foundation.

He considered scholarships and fellowships to be the most important part of the bill. He did not believe in including social sciences.

(17) *Lewis G. Hines*, national legislative representative of the A.F. of L. (pp. 255–56), urged favorable action on H.R. 1815 and identical bills. He was in favor of the inclusion of social sciences. As for patents, he said, "Use of public funds for research must be accompanied by safeguards to assure use in the public interest." Patents covering inventions and discoveries should belong to the agency financing the research. In Government ownership, full information should be made available to all with opportunity for nonexclusive license.

(18) A written statement was prepared by a *Panel of Appointees of the National Engineering Societies* (pp. 273–277). They believed that the primary purpose should be basic research, not applied. They also believed that no useful purpose was served by including the social sciences; that the Director should be under the general control of the Board; that there was need for scholarships; and that:

> If the Foundation is properly set up for the object of advancing basic sciences, the question of patents will not be serious, and in rare, exceptional instances could be properly handled under the provisions of the general patent law through appropriate contractual relationships determined by the Board.

3. ACTION TAKEN—HOUSE OF REPRESENTATIVES

a. Reports

H.R. 4102 was reported out by the Committee on Interstate and Foreign Commerce on July 10, 1947 (H. Rept. 864). It was made special order (H. Res. 289) and was reported out in H. Rept. 903.

tion, therefore, is to make it worthwhile for servicemen to resume their prewar activities under their patents. More particularly, it is designed to extend the terms of the patents granted to such persons, if by reason of their service they lost income which they otherwise would have received; or if such income was reduced during the time of their service.

The committee feels that in cases of the kind mentioned persons who served in the military or naval forces during the present war are entitled to have the time limitation of their patents extended, and the bill is drawn so as to accomplish that purpose.

H.R. 6346 passed the House on July 27, 1946 (Congressional Record, p. 10296). No action was taken by the Senate.

3. OTHER BILLS OF THE 79TH CONGRESS

H.R. 718, January 4, 1945 (Mr. Elston). This was a more general bill providing that whenever, due to a war or unforeseen circumstances, valuable patent rights have lapsed or will lapse without the patent owners obtaining a reasonable reward or remuneration, the President shall have the power to extend said patents for an additional term not to exceed 17 years.

H.R. 2043, February 7, 1945 (Mr. Rowan). This bill was similar to H.R. 718 (above).

H.R. 3069, April 27, 1945 (Mr. Grant of Indiana). This was a general bill providing that all patents unexpired on the date of enactment of this act are extended for a period equal to the period beginning on December 7, 1941, and ending on the date of the termination of the war as proclaimed by the President or declared by concurrent resolution of the Congress.

H.R. 6071, April 10, 1946 (Mr. Beall). This bill combined the inability to manufacture due to war material shortages, etc., with the inability to exploit an invention because of service in the armed services. The extension was to be for twice the period in which the patentee failed to receive income from the patent. The extension was in no way to impair the rights of others in the patent.

S. 840, April 6, 1945 (Mr. Capehart). This bill was similar to H.R. 3069 (above).

4. BILLS INTRODUCED IN THE 80TH CONGRESS UPON WHICH HEARINGS WERE HELD

a. Provisions

H.R. 65, January 3, 1947 (Mr. Grant of Indiana). This bill was similar to H.R. 3069 and S. 840 of the 79th Congress.

H.R. 124, January 3, 1947 (Mr. O'Hara). This bill was similar to H.R. 1190 and H.R. 6346 of the 79th Congress.

H.R. 1107, January 20, 1947 (Mr. Rich). This bill was similar to H.R. 6346 of the 79th Congress.

H.R. 1984, January 17, 1947 (Mr. Stratton). This bill was similar to H.R. 2043 of the 79th Congress.

small business. Good progress also is being made in other Army and Navy installations.

Other witnesses testified as to the importance of granting Government contracts to small business, but there was little discussion of the research and development aspect.

b. Action taken, House of Representatives—H.R. 7963

After the hearings, a clean bill (H.R. 7963) was introduced and reported favorably (H. Rept. No. 555), June 13, 1957. Its provisions are discussed supra, page 138.

H.R. 7963 was debated in the House on June 25, 1957 (Congressional Record, pp. 10205–10245), and passed by a large majority (p. 10245). Mr. Thompson of New Jersey (p. 10225) expressed the hope that H.R. 7963 would really take care of granting a fair proportion of all types of Government contracts to small business, and would not continue to be "just a pious hope and expression."

c. Hearings, Senate

The Senate Committee on Banking and Currency held hearings on the credit needs of small business. Part 1 of these hearings were held during the 1st session of the 85th Congress and did not deal, to any great extent, with the problem of encouraging research and development by small business. Part 2, however, held May 23, 1958, included considerable testimony on this aspect as a device for aiding small enterprises to remain in business. Senator Fulbright's bill, S. 2993, was discussed in this connection.

(1) *Senator Fulbright* (pp. 558–559) asked that his statement explaining S. 2993 be printed in the hearings. It reads as follows:

> The growth and progress of industry and commerce in the United States has been, to a very considerable extent, the result of research and development. Research in the fields of electronics, chemistry, physics and other sciences has yielded principles which have been further developed and applied to reveal the new world we see around us. The patent system, the land-grant colleges and universities, the Smithsonian Institution, the National Bureau of Standards, the Naval Research Institute, and the National Science Foundation indicate the importance which the Federal Government has always placed upon the increase and diffusion of knowledge among men and the application of this knowledge to useful arts and sciences for benefit of the Nation at large.
>
> Basic and applied research and the development of useful applications of the principles which are discovered are going on at a remarkably high rate today. We can expect that the current research and development work will result in even greater changes in the world of tomorrow.
>
> According to a survey made by the Bureau of Labor Statistics for the National Science Foundation, on the research and development work performed in 1953, the total of this research and development work amounted to more than

He said that the Foundation should support basic research primarily, but surveys and policy recommendations should encompass all of science. "Both H.R. 6007 and S. 2385 are too restrictive on this point." He recommended that the word "basic" be eliminated in section 4(a). He did not agree with setting up special commissions and said that classified work was disadvantageous to the work of the Foundation. He also told of the dangers of coupling scientific support and foreign policy.

(4) *Representative Fritz Lanham* (pp. 94–99) objected to the creation of this Foundation. He said:

> In my judgment, the enactment of this bill would provide the basis for bureaucracy on a broad scale, and I think in all probability it would retard rather than stimulate our progress in the field of invention.

He also said that Government ownership and control of patents would stifle the incentive to invent.

(5) *Miscellaneous witnesses.* Approximately 25 letters and statements were submitted that supported the establishment of a National Science Foundation and about 5 were definitely opposed to it. Letters and statements were presented from the Government agencies and other organizations expressing their opinions on the bills.

Various views were presented favoring the legislation. Special commissions that were included in this bill were criticized as restricting the research. A letter from Robert W. King was included which opposed creation of the National Science Foundation. He advocated amendment of the personal income tax formula, so existing foundations could draw extensively from personal incomes.

3. REPORTS

a. House Report 2223

On June 4, 1948, the Committee on Interstate and Foreign Commerce reported favorably on H.R. 6007, with a few minor amendments. It described the purpose of the bill as follows:

> Stated briefly, the purpose of this bill is to create an independent agency of the Government to be known as the National Science Foundation and to grant to that agency appropriate authority to be used for the following purposes:
>
> (1) To develop and encourage the pursuit of a national policy for the promotion of basic research and education in the sciences;
>
> (2) To initiate and support basic scientific research through contracts or other arrangements, and to appraise the impact of research upon industrial development and upon the general welfare;
>
> (3) To initiate and support (after consultation with the Secretary of Defense) scientific research in connection with matters relating to the national defense through contracts and other arrangements;
>
> (4) To grant scholarships and graduate fellowships in the sciences;