DOUBLE

b. Hearings

Hearings were held on the above bills by Subcommittee No. 3 of the House Committee on the Judiciary on March 9, 1955.

(1) *The Department of Commerce* (p. 7) presented a letter stating it would not object to H.R. 2128, if enacted, but it felt that the administrative problem involved in processing demands would be extremely difficult and expensive. It opposed enactment of H.R. 3134.

(2) *The Department of Justice* (pp. 7–8) presented a letter concerning H.R. 2128 which concluded:

> The bill would benefit only some of a group of manufacturers who were prohibited from producing similar articles. Many groups, other than patentees, can claim injury to their business due to the war and war orders. Furthermore, many of the patents that might be extended have expired. The extension and subsequent revival of these expired patents would create inequity in their effect upon investments, commitments and plans made in reliance on the normal expiration of patents. The bill would create uncertainty as to the expiration date of all patents. Persons and corporations who have made plans and preparations to begin manufacture of a patented item when the patent therefor expires should, except in extraordinary cases, be secure in the knowledge that the patent will expire in accordance with its terms and not be extended or revived for an indeterminate period.

(3) *Other testimony* ran along the lines of the hearings in the 83d Congress.

c. Committee and other action

H.R. 2128 was reported by the House Committee on the Judiciary on June 20, 1955 (H. Rept. 1297). The committee pointed out that the general purpose of the bill was to authorize the extension of certain patents for terms comparable to the period that their normal use or development was prevented or substantially curtailed as a result of World War II or the Korean conflict.

Inasmuch as the committee report discussed certain crucial issues attending the extension controversy, these comments are set forth in some detail:

EXCLUSIVE RIGHTS OF PATENTEES

> One of the major issues before the committee was whether the Government, by imposing wartime controls, breached its agreement to secure to patent owners the exclusive right to the full use and control over their inventions for a period of 17 years. The argument was urged that while the patent owner may have been prevented from using a patented invention because of inability to obtain materials, etc., he was nevertheless not prevented by Government production controls from being able to exclude others from infringing on his patent rights.

(a) the granting of a license to the United States without payment of royalty or at a nominal royalty;

(b) any restrictions or prohibitions imposed by the United States by reason of a war or other national emergency; or

(c) any circumstance beyond the control of such owner or holder or resulting from the existence in the United States of a state of war or other national emergency.

H.R. 4054, May 10, 1951 (Mr. Walter). It provided:

that the term of any patent may be extended in accordance with the provisions of this act if the normal return has been prevented, impaired, or delayed, during the period beginning May 27, 1941, through November 4, 1945, inclusive, by reason of inability to obtain materials due to the fact that materials required were subject to Government priorities or allocations.

Both bills contained procedural provisions which contemplated application to the Commissioner for an extension, with review by the Court of Customs and Patent Appeals. Both provided an absolute exemption of the United States from all liability during the extended term; an exemption for things made and sold in the period between expiration of a patent and its revival for an extended term; and a provision allowing licensees either to cancel or to continue on the same terms for the extended period. Both bills provide for an extension for a period "commensurate with the extent to which normal economic return from such patent was so prevented, impaired, or delayed."

b. Hearings

Hearings on the above bills were held before Subcommittee No. 3 of the House Committee on the Judiciary on June 20 and 22, 1951.

(1) *Representative Francis E. Walter* (pp. 4–6) testified in favor of his bill, H.R. 4054. He said:

I believe that everyone admits that America's inventive genius has helped to make this country great. No one seriously questions the wisdom of protecting the inventor through an effective patent system. * * * The patent is a property right, of which the owner cannot be legally deprived, even by the Government, without the payment of just compensation. But, what of the deprivations that result when the Government, through restrictions, priorities, and allocations, has effectively prevented use of a patent during 4 or 5 of those 17 years?

It is a basic principle of jurisprudence that he who grants a right, also impliedly covenants that he will not deprive the grantee of the enjoyment of that right. * * * Even in the field of patents, this committee and Congress have repeatedly recognized this essential justice in particular cases.

The trouble is that heretofore we have attempted to deal with the matter piecemeal, by private bills for relief of

Now, the retarding effect of the Commission's action befor the war may be attributed to inertia, to the failure of the industry to keep itself and the Commission adequately informed, and, perhaps, to the natural caution of a regulatory body in dealing with new things. But after the war the Commission put another damper on the development of FM, which cannot be explained on any of the grounds that I have mentioned.

Contrary to the unanimous recommendation of the radio industry, and relying on the testimony of a Government engineer who made certain predictions as to the probable behavior of radio waves—predictions which were later proved and admitted to be wrong—the Commission made a drastic change in the wavelength assignments for FM broadcasting; so the job had to be done all over again.

In that manner a period of about 2 years was cut off the effective life of the patents, which at the end of the war had only 5 years to run.

I am sure that your committee can find many other examples where Government by bureaucratic fiat has cut down or even destroyed by action of other branches of the Government.

In the case of the FM patents, the royalty-producing period was about a year before the war and about 4 years after the war—or a total of 5 years, instead of 17. I make no complaint about the past, but it is something in the future your committee will have to deal with because 17 years is all too short a time to exploit a really important invention under government by commission.

There is one thing that I would like to comment on and then I will conclude. The National Association of Manufacturers said that one of the most important things about a patent is the date on which it expires. I would like to meet that statement head on by saying that the important thing about a patent is the date it is issued and shows the public something new—how to do something new that they did not know how to do before.

By the time the patent has expired the royalties that accrue to the inventor are usually down to 1 or 2 percent, no particular factor at all as far as any burden on the public is concerned; and likewise at the time everyone who wanted to, has already gotten a license.

(6) *Roberts B. Larson*, patent attorney (pp. 72–74), testified in favor of H.R. 1228. He felt that existing law was unjust to veterans who had entered into assignment agreements, but still held substantial rights in their patents.

(7) *Harry H. Hitzeman*, patent attorney (pp. 76–84), urged the passage of a general patent extension bill, authorizing extensions on the various grounds in the pending bills. He added:

> The only just and sensible way for this Government to live up to its contract with inventors and patent owners is to assure them, by the passage of a general patent-extension law such as H.R. 1301, that they are guaranteed of no interfer-

3. It would result in uncertainty as to the expiration dates of patents, a matter of great importance to manufacturers who are planning new products.

4. The National Organization of Patent Lawyers is opposed.

5. The National Association of Manufacturers (many of whose members are owners of patents) is opposed.

6. The Department of Justice has reported adversely on this bill.

7. The Bureau of the Budget has voiced the following objections to the bill:

"The Bureau of the Budget further advises that it 'is opposed in principle to using exceptions to the patent system as a method of bestowing benefits on selected individuals or corporations. Benefits under these bills would have little, if any, relation to the injury sustained by the patentee; persons reasonably relying on the terms of a patent might be damaged; administration of the exceptions would present difficulties and may require increased funds for the Patent Office; and extension of patents whose practice was curtailed by production controls would so widen the area of exceptions as to serve as an important precedent for additional exceptions in the future. A great many people were unable to fully exploit their profession or property as a result of production controls. Enactment of these bills would bestow benefits on a very small group of them even though there seems to be no convincing evidence that this group has a specially meritorious claim.' "

8. This bill is now too late. Relief to applicants will depend on events and facts which occurred in 1942–45. The evidence is cold. Witnesses will be unavailable. Bills seeking this relief have been filed in several previous Congresses and have always been rejected. This bill should not be enacted at this late date.

9. The argument for this relief based on justice and equity is a false argument.

The House debated and passed H.R. 2128 on March 7, 1956 (Congressional Record, p. 4227). An amendment was offered to strike out subsection (2), but this was defeated. Subsection (2) provided for extension where:

(2) the normal use, exploitation, promotion, or development of the inventions described and claimed in any patent of the United States was prevented or substantially curtailed by any order of an agency of the Government prohibiting or limiting the production or use of any class of machines, articles, or materials, or the use of any class of processes or formulas.

The Senate reported out H.R. 2128 (S. Rept. 2704) on July 20, 1956. The report followed the lines of the majority report of the House. The committee believed that the legislation was meritorious and that to amend the bill would result in the loss of any legislation on the subject matter.

b. Hearings

Hearings were held on these four bills by the House Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary, April 2, May 9 and 14, 1947.

Witnesses appearing before the committee were as follows:

(1) *Francis D. Stephens*, chairman, law and rules committee of the American Patent Law Association (pp. 11–16), told the committee that his organization voted to oppose the passage of all four bills. He said:

> The vote in this direction was because the association is in principle against the passage of any bill which would extend the life of any patent, although we realize that there are special hardship cases, as where fraud has been involved, in which justice demands that the life of a patent should be extended.
>
> * * * * *
>
> In general, the reasons for this opposition lie in the fact that the patent system is extremely complex. There are hundreds of thousands of valid patents, patents on which the 17-year period has not yet run out. Some of these patents, a great many of them, perhaps, are worthless. A great many of them are extremely valuable. Because of the number of them, industry must watch very closely as to where they stand with respect to valid patents.
>
> In anticipation of the expiration of a patent, certain industries may start to acquire materials, build plants, or lay plans for getting into a market which was heretofore held under a patent monopoly. A considerable investment may have been made. Then if the life of that controlling patent is extended, industry suffers.
>
> * * * * *
>
> The members of my association feel in general that all patent rights were curtailed during the war, the same as all private rights and efforts were curtailed during the war. In other words, while it is true that a serviceman suffered by not being able to exploit his patent rights, it is also true that a civilian owner of a patent could not exploit his patent rights because (1) he may have been engaged in war service, such as by working in a shipyard; and (2) industry was geared to the war effort and materials and labor were not available to the manufacturer to use and sell an invention which was set forth in his patent.
>
> Mr. KEATING. Perhaps the test should not be that, but was the contribution of the veteran such to his country that he is entitled to some extra consideration by reason of that?

(2) *P. J. Federico*, law examiner, U.S. Patent Office (pp. 19–27), stated that the position of the Patent Office in the past has been to oppose, in principle, proposals for extending the term of issued patents.

scientists. The membership of these committees cannot, remembering their judicial role, emphasize individuals who have an enthusiasm for the project in question. They, therefore, in their objectivity, record merely the general climate of thinking at the moment and tend to recommend the adoption of unadventurous policies.

The plan I would propose would restrict the activities of such scientific committees to the evaluation of the reputation of those scientists and engineers who are willing and anxious to devote themselves and to pledge their reputations to the achievement of special projects. These scientific committees would thus serve essentially to establish the credit rating of the backers of a project. Note that these backers must be willing to commit their time and reputation to the success of a project, and not just offer their judgment that it is a good or bad idea.

I submit that this type of procedure would give us a far closer coincidence of responsibility and authority than we now have. The formulation of a bold administrative policy in areas of adventurous and expensive research will buy us the speed which is desperately necessary for survival in our time.

(9) *Dr. C. C. Furnas,* chancellor, University of Buffalo (pp. 731–773), cited what he believed to be the five most compelling reasons for man to explore space. They were (1) international prestige, (2) possible military advantage, (3) the spirit of adventure, (4) the possibility of practical technical advances, and (5) the thirst for knowledge—the desire to learn more about the cosmos.

He agreed that the new organization should absorb the present National Advisory Committee for Aeronautics, and the new agency should have expanded authority and liberalized policies for the support of research by outside agencies. He said:

Certainly scores of excellent research laboratories in universities, research institutes, and some industries should be supported by contracts in contributing research knowledge to the multiheaded problems of space.

If this aspect is not adequately handled, the national program will be greatly weakened. There is always the tendency, even if not the intent, for large Government organizations to become monopolistic. This tends to freeze out great blocks of talent, new ideas, and appropriate competition. Further, it seriously shrinks the reservoir of manpower from which future research talent can be drawn. I trust that adequate attention will be given to this important matter.

(10) *Dr. Alan T. Waterman,* director, National Science Foundation (pp. 973–1022), gave his views on the need for accelerating our progress in space research, technology, and exploration. He said:

At the outset let me state that I heartily endorse the general outline of H.R. 11881, H.R. 11882, and S. 3609, which I believe are before you.

The establishment of a new civilian agency appears to me to be the best method for carrying out the objectives desired.

The organization should be at a high level and it should be, I think, independent of the military, not because the military are not competent; they are indeed competent; they are also very conscious of the significance of science in the defense of our country. I have made the statement privately a number of times and I would like to make it publicly here: that since the end of World War II, in my opinion, outside of the academic world there is no group in the United States that is more conscious and appreciative of the significance of science in the future security of our country than is the military. They have gone to great efforts to promote basic science. I think in many cases they have "bootlegged" basic science into their programs because they realized it was necessary and because, until very recently, we had no national organization to fund the basic research that would be of value to them.

But in this particular case, I feel that the space exploration should not be under the control of the military because their objectives are not the same as the objectives of this space agency should be. The interest of the military must center on specific defense equipment. They must, by the nature of their operation, concentrate on shorter range goals than basic research.

I do not think we should consider the problem from the viewpoint that the scientists should be under the control of the Government in exploring space. There are two aspects to this problem, in my opinion: (1) The U.S. Government should give its scientists the opportunity to make the basic explorations that are so important to our future. (2) The U.S. Government should then, of course, adopt policies as to the utilization of space and what is to be done with the scientific results and the instrumentation that result from the program. This point of view is slightly different from the one mentioned this morning.

It is my opinion that there is no better expenditure of the taxpayers' money, for the future of this country, than in basic research. It pays off in the long run with greater dividends than any other expenditure of funds that we make in terms of the future of our country, the future of our ideals, and of our democracy.

That is why I feel so strongly that this national space agency is a vital and important agency for our country.

There would be a great many very tangible and explicit benefits. I do not want to take much time in discussing these but I should like to point out, for example, that weather forecasting, in my opinion, will become a science instead of an art. When it is possible to make observations continuously over the entire earth's surface of cloud coverage, the temperature, the water vapor content above the reflecting surface and the wind, and on a daily basis, the satellites will then provide the information necessary to give us a sound theory of weather. This theory, coupled with the great computing machines to utilize the data and to apply the

made from space vehicles; and (5) submit an annual report of operations and accomplishments to the President.

It authorized the Agency to (1) make rules, regulations, etc., governing its manner of operation, (2) appoint and employ necessary employees, (3) construct, acquire, maintain, etc., laboratories, testing sites, and other facilities for space vehicles, (4) accept gifts of real and personal property and services, (5) enter into contracts necessary to carry out purposes of the act, (6) use services and equipment of other Federal agencies, (7) appoint consultatory advisory committees, (8) obtain temporary services of experts at $100 per diem, (9) employ alien and retired service officers under certain conditions, (10) enter into cooperative agreement under which members of the Army, Navy, Air Force, and Marines may be detailed for special services, (11) conduct or provide training, and assign employees to research, study, or training, at Federal or non-Federal facilities and, if deemed appropriate, pay in whole or in part the salaries of such employees while in training, (12) authorize employees to attend meetings concerned with functions or activities of the agency, (13) handle claims for damages of $5,000 or less resulting from personal injury, death, or damage to personal property, (14) arrange for security investigations of personnel, and (15) direct officers and employees to carry firearms while in the conduct of official duties.

It permitted the Atomic Energy Commission to authorize access to restricted data by members of the Board or advisory committee members, etc., in the performance of their official duties.

The bill provided penalties for willful violations of security orders. It permitted transfer of related functions to the Agency within 3 years after enactment of this act.

It extinguished the National Advisory Committee for Aeronautics and transferred all property, personnel, etc., pertaining thereto to the National Aeronautics and Space Agency.

It made technical amendments in other Acts corresponding to the purpose of this act.

Five other bills, identical to H.R. 11881, were also introduced on April 14, 1958. These were as follows: H.R. 11882 (Mr. Arends), H.R. 11887 (Mr. Haskell), H.R. 11888 (Mr. Keating), H.R. 11961 (Mr. Frelinghuysen), and H.R. 11964 (Mr. Fulton).

b. Hearings and significant testimony

Hearings on H.R. 11881 were held before the House Select Committee on Astronautics and Space Exploration, April 15 through May 15, 1958.

In general. One point on which the witnesses were in complete agreement was that the exploration of space by the United States was a matter which deserved the highest urgency. The establishment of a national space program was held urgent both for reasons of immediate national defense and to insure that in the long run outer space would be effectively utilized for peaceful purposes. It was felt that the United States was behind the Soviet Union today in its ability to use outer space, and only much hard work and intelligent planning and organization could overcome this lag in the years ahead.

Another point brought out in the hearings was the necessity for coordination of our national space policy at the highest levels of Gov-

visions of Executive Order 10096 (1950).[100] and each employee had to report all inventions he made to the Committee. (See Appendix A.) This contrasted with the earlier policy under which the title to inventions was left with the employees and the Government received royalty-free licenses.[101] The NACA's research contracts contained a clause that the Government would receive a royalty-free, nonexclusive, irrevocable license on any invention made by an employee under the contract.[102]

3. HISTORY AND ACHIEVEMENTS

The growth in the Committee's facilities and operations paralleled the steady rise in importance of aviation, and the role of the NACA can best be seen through a brief summary of its history and achievements.

Shortly after the foundation of the National Advisory Committee for Aeronautics in 1915, a survey was made of the existing aeronautical facilities. The results of the survey were not favorable, and the Committee decided to build its own laboratory at Langley Field, Va. By 1920, a 5-foot wind tunnel had been constructed at the field as well as an aerodynamical laboratory and an engine laboratory. During the 1920's and 1930's the National Advisory Committee for Aeronautics carried on much basic research, emphasizing the testing of airframes rather than engine development.[103]

With the coming of World War II, however, basic research largely gave way to work on specific wartime projects and to testing of military aircraft. The war also made imperative an enlargement of Committee facilities. In 1939, Congress authorized an expansion at Langley Field; in 1940 construction was begun on two new Committee laboratories. The Ames Aeronautical Laboratory at Moffett Field, Calif., was to deal with problems of aerodynamics, while the Flight Propulsion Research Laboratory in Cleveland was concerned with engine research, including the development of jet engines. In 1945, the operations of the Langley Laboratory were still further enlarged as the Pilotless Aircraft Research Station, established on Wallops Island, Va., began experimentation with guided missiles. During the war the NACA personnel staff increased from 523 in 1939 to 6,804 in 1945.[104]

On September 30, 1958, the National Advisory Committee for Aeronautics had a staff of 7,966 scientists and other personnel, and its laboratories and facilities reached a value of approximately $350 million measured in original cost.[105] During fiscal year 1958 the NACA obligated $41 million for construction and equipment and $76 million for salaries and expenses.

During the years following World War II, many aeronautical advances resulted from NACA research. On October 14, 1947, the research airplane Bell X–1 attained supersonic speed, and on November 20, 1953, the Douglas D–558–II flew twice as fast as the speed of sound. In 1950 a transonic wind tunnel went into operation at the

[100] See discussion of Executive Order 10096, supra, at pp. 16–17.
[101] U.S. Department of Justice, Investigation of Government Patent Practices and Policies: Report and Recommendations of the Attorney General to the President, vol. II, pp. 227–235 (1947).
[102] U.S. National Aeronautics and Space Administration.
[103] Robert Schlaifer and S. D. Heron. Development of aircraft engines. Development of aviation fuels; two studies of relations between Government and business, p. 33 (Boston, Harvard University, 1950).
[104] George W. Gray. Frontiers of Flight: the story of NACA research, pp. 9–33, 336.
[105] U.S. National Aeronautics and Space Administration, First Semiannual Report, Oct. 1, 1958, through Mar. 31, 1959, p. 4.

Mr. Robertson said that as an alternative to the present bill, the Commissioner of Patents could be given power, subject to opposition and to review by the courts, to determine whether an applicant deserved an extension or not.

For example:

> * * * suppose that John Doe wants an extension of a patent, and under the terms of the bill he will have 5 years' extension granted to him, if any. John Doe should be made to show two things, the things set forth in this bill; to wit, that he was doing his best to put it on the market at the time he was inducted into service, and so on; and that there is a hardship resulting; and then the bill should provide that anyone who is damaged by the extension, the possible extension, should have a chance to come and oppose it, and then this committee or the Commissioner of Patents or the Secretary of Commerce or some court should be given power to decide whether the facts in that case justify extension.

He added:

> But I think that in view of the fact that proponents of this bill think there is going to be only a few applications for extension, it would be better to have them sifted out, even at the expense of additional work on the Patent Office, or some court if you wish, rather than to pass a blanket bill giving extension to people that you have no idea of now, and affecting vital interests, the biggest interests of the country, you may say. You do not know. You cannot tell where it will reach.

c. Action and enactment of H.R. 10435

H.R. 10435 was favorably reported out in the House and Senate Committees on Patents (H. Rept. 1314 and S. Rept. 1296).

The House committee, in issuing its report on April 19, 1928, stated:

> When war was declared in April 1917, and the conscription act was passed, all able-bodied men were called to the colors, including men who were the holders of patents; and it has developed that a few of them, at least had started to build organizations for the development of the invention on which a patent had been issued, but the call to war caused a necessary abandonment of such organization, and the invention and development were left at a standstill while the men were in service.
>
> The purpose of this legislation is to extend the monopoly given to these men, if by reason of the fact that they were taken into service, they lost the income that they would otherwise have received, or if that income was reduced during the time spent in the military service.
>
> The committee feels that in cases of this kind these men are entitled to have the time limitation of their patents extended, and the bill is drawn so as to extend the monopoly for a period three times the length of the service in the World

e. Canal Zone Biological Area

The act of July 2, 1940, as amended by the 1946 Reorganization Plan No. 3, gave control of the Canal Zone Biological Area to the Smithsonian Institution.

Section 2 stated:

> The purpose of setting aside such an area is to preserve and conserve its natural features, including existing flora and fauna, in as nearly a natural condition as possible, thus providing a place where duly qualified students can make observations and scientific investigations for increase of knowledge, under such conditions and regulations as may be prescribed by the Smithsonian Institution.

f. National Air Museum

The act of August 12, 1946, established the National Air Museum as a bureau of the Smithsonian Institution. It read in part as follows:

> SEC. 1 (a). There is established under the Smithsonian Institution a bureau to be known as a national air museum, which shall be administered by the Smithsonian Institution with the advice of a board to be composed of the Commanding General of the Army Air Forces,[68] or his successor, the Chief of Naval Operations, or his successor, the Secretary of the Smithsonian Institution, and two citizens of the United States appointed by the President from civilian life, who shall serve as such members without compensation. * * *
>
> SEC. 2. The national air museum shall memorialize the national development of aviation; collect, preserve, and display aeronautical equipment of historical interest and significance; serve as a repository for scientific equipment and data pertaining to the development of aviation; and provide educational material for the historical study of aviation.

The executive departments of the Government were to give their aviation collections to the Museum (sec. 5). The head of the Museum was to be appointed by the Secretary of the Smithsonian Institution (sec. 1(b)).

It can thus be seen by examining the legislation which set up new bureaus and special projects for the Smithsonian Institution, that not only its physical facilities, but also its objectives and its functions have expanded since 1846.

VI. NATIONAL ACADEMY OF SCIENCES AND NATIONAL RESEARCH COUNCIL

A. THE NATIONAL ACADEMY OF SCIENCES

1. ESTABLISHMENT

The National Academy of Sciences was established by S. 555 (37th Cong.), introduced February 20, 1863, by Senator Henry Wilson. Section 1 named those persons who would constitute the Academy,

[68] The act of July 26, 1947, transferred this membership to the Chief of Staff, U.S. Air Force.

The successful example of the Joint Committee on Atomic Energy has been closely followed. Thus, for example, the Joint Committee on Aeronautics and Outer Space would be composed of nine members from each House, no more than five of whom could be members of the same political party. The chairmanship would alternate with each Congress between the two Houses.

(8) The bill provides in general that information obtained or developed by the Administrator shall be made available for public inspection. This provision affirms the intent of Congress to let the people know all the facts, and to promote the spread of scientific knowledge, subject only to necessary security restrictions. Exceptions are made for information which is authorized or required by Federal statute to be withheld or is classified to protect the national security. The bill further provides that nothing in the act shall prohibit the furnishing of information by the Administrator to the Senate or the House of Representatives or to any committee of Congress.

(9) The bill authorizes the agency to engage in a program of international cooperation in carrying out its functions and in the peaceful exploration and use of outer space. Although not in the previous bill, except as a declaration of policy, a provision to this effect was later proposed by the President.

Your committee points out that section 302(a)(6), line 3 of page 19 permits the Administrator to cooperate with other public and private agencies. It was the committee's intent to authorize such cooperation with foreign and overseas organizations or individuals when deemed appropriate. The experience of the International Geophysical Year is illustrative of the benefits such authority might promote.

A new section (507) provided for patent rights, as follows:

Subsection (a) provides that any invention or discovery made or conceived under any contractual or other relationship with the new agency shall belong to that agency, unless the Administrator waives the agency's claim to such invention or discovery.

Subsection (b) provides that where the Administrator waives the agency's claim to an invention or discovery made or conceived under such a relationship, he shall retain the right to use the invention or discovery in carrying out his functions and to license it to others for use in carrying out the activities authorized by the act; and in any such case he may pay or require any licensee to pay the inventor or discoverer a reasonable royalty for the use of the invention or discovery.

Subsection (c) authorizes the Administrator, in any case where the new agency's claim is not waived under subsection (a) and the invention or discovery accordingly becomes its property, to pay the inventor or discoverer a cash award as compensation for the invention or discovery.

With a large expenditure and with a necessity for long-term planning, it appears to me that there must be a well-integrated national program, and this means, then, that a single agency should integrate and control the program rather than to have it on a catch-as-catch-can basis as some of our research activities have been up to now, and quite rightly so, because there is much research which obviously should be supported by different agencies. But when we are talking about a project of this magnitude, then I feel a single agency, a single space agency, a civilian space agency, is required. It is necessary that this agency have the imagination and the boldness to establish a program which is ambitious but not rash. It is necessary also that this agency have the continuing funds necessary to carry out such a program.

The magnitude of the efforts becomes comparable to the AEC type effort, but I feel that this is a different sort of activity than the AEC in that rather than growing out of—rather than having a program which grows out of a military requirement, as the AEC program has grown and broadened from its initial military objectives, here we have a program which I feel should start on the other side. It has more similarity to the IGY Antarctic program where the effort is initially scientific and there may be military byproducts which will develop later on, but the organization which carries out the program, rather than being an AEC-type operation with strong military overtones should start in the other direction as a scientific operation which will develop military by-products.

The present bill which proposes a new national space agency would appear to me to meet the objectives as I see it. I do feel that there is one comment I would like to make, however, and that is the association of the National Space Agency with the National Advisory Committee for Aeronautics. I feel that the new Agency has to do a job which is quite different from the job which is now being carried out by the NACA, and in this light, then, I regard the new Agency as in fact a new Agency which incidentally absorbs the NACA rather than an agency which grows out of the NACA. I believe that the wording of the bill is such as to imply this, but I merely wanted to emphasize that from my point of view I feel that this is important, that the new Agency have the authority and have the tasks assigned to it which are in the bill and which are a different set of tasks than those assigned to the NACA.

(4) *Dr. James Van Allen*, chairman, Rocket and Satellite Research Panel, and professor of physics, University of Iowa (pp. 355–359), listed the following purposes of a national space program run by a civilian agency:

In the first place, there is a vast amount of ignorance, just simple ignorance, about what is going on in the upper atmosphere of the earth and in the space surrounding the earth. So I feel that the first, and the most basic undertaking of the civil agency is the investigation of the phenomena of nature on a geophysical and astrophysical scale.

Committee headed by a Chairman appointed by the President and composed of military representatives. Its members, through daily contact with Administration personnel ,would have coordinated aeronautical and space activities of the military departments and the new agency and resolved differences arising from a determination of jurisdiction.

The Senate amendment did not provide for a Military Liaison Committee. The conference substitute provided for a Liaison Committee composed of representatives, in equal number, of both the military departments and the Administration. In the event of a failure of the Liaison Committee to reach an agreement, the decision of the President would be final.

The conferees did not include the section providing for an Atomic Liaison Committee, feeling that the Administrator would cooperate with the Atomic Energy Commission under general authority contained in the act empowering him to do so.

Both the House bill and the Senate amendment contained similar provisions authorizing the new agency to engage in a program of international cooperation, included in section 205. Under the House bill, such program would have been carried on under the foreign policy guidance of the Department of State and pursuant to agreements negotiated or approved by the State Department. The Senate amendment provided for "agreements made by the President with the advice and consent of the Senate." The conferees adopted a revised version of the Senate provision, specifying that the Administration would act under the foreign policy guidance of the President rather than the State Department.

Section 304 dealt with the often discussed problem of security. The House bill contained a provision requiring the Administrator to "establish such security requirements, restrictions, and safeguards as he deems necessary in the interest of the national security." The Senate amendment did not contain this provision, but left the matter, to be covered by existing law. The conferees adopted the House provision. Both measures contained provisions authorizing the Atomic Energy Commission to give Administration personnel access to restricted data. The conference adopted a substitute broadening this provision to give individuals granted access to such data the authority to exchange such data with similarly cleared military personnel.

By way of explanation of the patent provisions in section 305, the conference report concluded:

> Operating on the theory that the Government's interests must be protected, but with the concomitant purpose of protecting private interests and of keeping private incentive and initiative at a high level, the committee of conference adopted entirely new patent provisions.

Section 306 on the contributions awards was also added in conference.

Public Law 568 was called the National Aeronautics and Space Act of 1958. Its main provisions are as follows: It was declared to be the policy of the United States that activities in space should be devoted to peaceful purposes; that the general welfare and security of the United States require adequate provision for aeronautical

started now in order that complete systems will be ready later when required. One long leadtime which all witnesses agreed needed particular stress was that of adequate educational support. The scientists and technicians that the astronautics program will require, will take many years to nurture. What we do today will determine the supply of such men and women in the decades ahead.

The foregoing summarizes the main features of the testimony. The ensuing accounts of the statements of specific witnesses, which in toto were quite extensive and covered many features, deal only with their testimony on points relevant to the present discussion, to wit, means of encouraging, facilitating, and coordinating research and development in this area, inventions and patent policy, and related matters such as the effect of security restrictions, need for education, etc. Discussions dealing with the political aspects, technological feasibility, problems of space law, and international agreements with respect thereto—matters that deservedly received much attention—have been omitted.

Specific witnesses included the following:

(1) *Dr. Wernher von Braun*, director, Development Operations Division, Army Ballistic Missile Agency, Huntsville, Ala. (pp. 16–46, 61–81), looking ahead in the program of outer space, said:

> We can meet this challenge only if we appreciate and respect the magnitude of this task and discontinue our unfortunate practice of supporting only such research and development that serves immediate military objectives.
>
> The research and development requirements ahead of us are so vast that there should be no question in anyone's mind about a shortage of workload for any of the qualified development teams. It may be wise to have some overlapping of programs and to instill a bit of competition between teams. However, we must carefully retain the present atmosphere of free and full exchange of information in order to avoid costly duplication of effort and to provide for mutual assistance between teams. Also, our scientists should be free to pursue their efforts without continual worry about a program cancellation putting them out of business and thus destroying the team they have built up. The ABMA record of accomplishment for money spent is full evidence that waste will not occur if the existing well-qualified development teams of the country are kept together and allowed to pursue their goals under competent management in a coordinated program.
>
> The Russians have shown clearly their recognition of the importance of the entire field of rocket-propelled devices leading to space control. They have further shown an understanding of the interrelation between scientific and military programs in the entire field. Vigorous action is required to overcome as quickly as possible the obvious lead which the Russians now enjoy.

Representative Fulton asked:

> Would it help you as a matter of organization to have Congress set up a committee primarily responsible in this particular field so there would be close liaison and policy guidance to you as you carry out your work? Should we in

quarters pursuant to paragraph 7 may obtain a review of the determination by filing, within 30 days (or such longer period as the Chairman of the Government Patents Board may, for good cause, fix in any case) after receiving notice of such determination, a written appeal with the Chairman of the Government Patents Board and a copy of the appeal with NACA headquarters.

12. In the event of the filing of an appeal, NACA headquarters, subject to conditions of national security, shall furnish the Chairman of the Board in writing, promptly upon the filing of the appeal, the information required by paragraph 7(b) of attachment (1). The decision of the Chairman of the Board upon any appeal taken pursuant to paragraph 11 shall be final.

13. *Petitions.*—In the event that NACA headquarters determines pursuant to paragraph 7 that the domestic rights in and to an invention will be left with an employee with or without a license in favor of the Government, a report of this determination is required to be submitted to the Chairman of the Board for review, subject to the right of the employee, if he acquiesces in the determination, to file a petition in the event of a decision less favorable to him.

14. The Chairman of the Board will review such a determination by NACA headquarters, and his decision respecting the matter shall be final, subject to the right of the employee to submit to the Chairman, within 30 days (or such longer period as the Chairman may, for good cause, fix in any case) after receiving notice of such a decision, a petition for the reconsideration of the decision if it gives to the Government greater rights than the determination made by NACA headquarters. A copy of any such petition must also be filed by the employee with NACA headquarters within the prescribed period.

PATENT PROTECTION

15. *General.*—NACA headquarters, upon determining that an invention has been made under the conditions specified in paragraph 5, as defined in paragraph 6, shall thereupon determine whether patent protection will be sought in the United States by the National Advisory Committee for Aeronautics for such invention. A controversy over the respective rights of the Government and of the employee in any case shall not delay the taking of any action seeking such patent protection. In cases pursuant to paragraph 7 where it is determined that the domestic rights in and to the invention are to be left with the employee, action by the National Advisory Committee for Aeronautics looking toward such patent protection shall be contingent upon the consent of the inventor.

16. *Dispute as to rights.*—Where there is a dispute as to whether the Government is to obtain an assignment of the domestic rights in and to the invention or only a license thereunder, NACA headquarters will determine whether patent protection will be sought in the United States pending the decision of the Chairman of the Government Patents Board on the dispute, and, if NACA headquarters decides that an application for patent should be filed, will take such license rights as are specified in subparagraph 6(b)(2) of attachment (1), but this shall be without prejudice to acquiring an assignment of the domestic rights in and to the invention as specified in subparagraph 6(b)(1) of attachment (1) should the Chairman of the Board so decide.

science. Through this legislation the new devices and processes inaugurated during the war could be made available to the little businessman and small manufacturer; businessmen would use the Office for information; inventors would use it for an appraisal of their ideas; and private businesses would use it to get technology available through publicly-owned patents.

No further action was taken in the 79th Congress.

2. S. 493, FEBRUARY 5, 1947 (MESSRS. FULBRIGHT AND AIKEN)—80TH CONGRESS

a. Provisions

S. 493 was the successor to S. 1248. It provided for the establishment of a central clearinghouse of technical information in the Department of Commerce, for aiding research by inventors, and for promoting the introduction of inventions into manufacturing.

The bill endeavored to avoid putting the Government in the business of buying and selling inventions which appeared to have a commercial value. It placed the burden for exploitation of the individual's inventions upon the individual himself, rather than upon the Government, except to the limited extent for which special provision is made under sections 2(f) and 3.

Section 2(f) vested in the Secretary of Commerce the power:

> To initiate and sponsor, * * * engineering or technological research or development relating to articles, equipment, materials, supplies, structures, methods, mechanisms, and processes, such research or development to be carried on by public departments and agencies or by private profit or nonprofit institutions and persons pursuant to contracts or other arrangements under which he may finance, in whole or in part, such research or development from funds specifically earmarked for the purposes of this subsection under the terms of annual appropriations Acts.

S. 493 omitted several powers of the Secretary set forth in S. 1248, including the power "to offer to the public for private exploitation * * * such inventions * * * as he determines to be fitted for private developments."

Subsection 3(d) provided that:

> Any contract or other arrangement providing for a commitment of public funds hereunder (1) shall include an agreement whereby the United States Government, in the event the project proves commercially profitable, will receive a return of at least its share of the cost of the research or development project for which commitment has been made, except with respect to resulting patents retained by or assigned to the United States Government under the terms of such contract or other arrangement; (2) shall contain in any event such provision as may be deemed necessary and desirable to secure to the United States Government the continued use, free of any charge, on any invention, product, process, or patents resulting from the research or development project for which such

He did not agree with part of the bill:

> First of all I think industry has a powerful stimulus to do research anyway, and I rather doubt if the Government needs to step into that picture, and in the second place, industry is interested in taking basic scientific knowledge and trying to apply it to solve specific problems.

He felt that the Federal Government should not have patent rights developed in connection with industrial research. He agreed with the part of the bill that related to the collection and dissemination of scientific information.

(9) *Howard E. Blood*, president, Norge Division, Borg-Warner Corp., and chairman, committee on patents and research, National Association of Manufacturers (pp. 122–147), opposed the bill because:

> 1. It necessarily involves unwarranted invasion of private enterprise's legitimate and necessary sphere of activity.
> 2. The objectives of the bill are exceedingly unlikely to be attained because no corps of Government employees, no matter how large, could be sufficiently acquainted with all of the myriad activities, problems, and techniques of industry as to be able to render service of value.
> 3. The expense involved would be prohibitively large and out of all proportion to any actual benefits to be derived.
> 4. It would impair, rather than stimulate, the effectiveness of private enterprise.
> 5. There is no demonstrated justification for this legislation.

He favored greater dissemination of information, but doubted if it were possible to achieve this through the means mentioned in the bill. He pointed out that it was difficult to determine the potentialities of any new invention; how a Government official would make such an appraisal was, in his opinion, a moot question. It might actually end up discouraging inventors when encouragement should be given.

(10) *Clarence E. Earle*, representing Maryland Economic Council (pp. 178–189), said that the council unanimously supported S. 493. Three things he considered most valuable in the bill were: establishment of a reference repository covering every phase of scientific and comparable knowledge in the United States and abroad; establishment of a service making scientific and technical knowledge readily available to business and industry; and the promotion of the development of technology through applied research whenever independent business calls for assistance that requires such work.

(11) *Frank B. Jewett*, President, National Academy of Sciences (pp. 197–199), said:

> In summary, after having considered S. 493, I am very certain that legislation of the kind proposed is not needed; will serve no useful purpose; will tend to cause confusion in industry rather than aid it; and in the main serve merely to keep several hundred civil servants busy shuffling papers in the Department of Commerce to no material useful end.

He maintained that what the bill proposes is already being done in industry and commerce, would be of little aid to inventors, and would

2. REPORTS AND ACTION IN CONGRESS

On February 28, 1846, the select committee reported out a substitute but it differed little from the original proposal.[62] Congressman William J. Hough also introduced an amendment on April 21, 1846.

The House of Representatives discussed H.R. 5 on April 22, 23, and 28, 1846.[63] On April 29, 1846, the section providing for publication of certain lectures and for the granting of prizes for outstanding essays was stricken from the bill (p. 749). The House, by a vote of 72 to 42, also voted down section 7, which set up a normal school (p. 748). The House then agreed to the amended bill and passed it by a vote of 85 yeas and 75 nays (p. 750).

H.R. 5 was read in the Senate on April 30, 1846,[64] and on June 1, 1846, Senator John A. Dix reported it from the select committee with amendments (S. Journal, 320). The Senate passed H.R. 5 by a vote of 26 yeas and 13 nays on August 10, 1846 (S. Journal, 519). On the same day President Polk signed the bill, thus establishing the Smithsonian Institution.

3. PROVISIONS OF THE ACT

The act of August 10, 1846, provided that the President, the Vice President, the Secretaries of State, Treasury, War, and Navy, the Postmaster General, the Attorney General, the Chief Justice, the Commissioner of Patents, and the Mayor of Washington would form the Smithsonian Institution (sec. 1). Smithson's legacy of $515,169 was lent to the Treasury at a 6-percent rate of interest, dating from September 1, 1838. The interest accrued by July 1, 1847, which would amount to $242,129, was to be used for construction of the Smithsonian buildings, and the interest received thereafter was "hereby appropriated for the perpetual maintenance and support of said institution" (sec. 2). Section 3 provided that the regents should consist of the Vice President, the Chief Justice, the Mayor of Washington, three Senators appointed by the President of the Senate, three Representatives appointed by the Speaker of the House, and six other persons appointed by joint resolution of the Senate and the House, two of whom were to be members of the National Institute. The Senators were to serve for their Senate terms, the Representatives for 2 years, and the others, whose terms were staggered, for 6 years. The regents would elect from themselves a Chancellor of the Smithsonian Institution, a secretary of the Board, and a three-member executive committee. These groups would be responsible for approval of expenditures, but the Board was required to submit reports to Congress.

A site was to be chosen for the Smithsonian Institution (sec. 4), and the building was to be large enough to house extensive collections (sec. 5).

Section 6 stated:

> That, in proportion as suitable arrangements can be made for their reception, all objects of art and of foreign and curious research, and all objects of natural history, plants,

[62] Smithsonian bequest, 29th Cong., Report 370 (1846).
[63] Congressional Globe, 29th Cong., 1st sess., pp. 710-716, 718-720, 737-738, app. pp. 851, 891-894.
[64] Senate Journal, 29th Cong., 1st sess., p. 269.

He said that the bill should help eliminate the timelag between discovery and the use of the discovery.

As to patents, he said:

> The patent-development provisions of S. 1248 constitute, to my knowledge, about the only effort which is currently being made to find a legislative solution to the important problem of encouraging the more effective introduction and marketing of inventions.

He described the success of the National Inventors Council during the war in stimulating military inventions.

(3) *Brooks Walker*, inventor (p. 26–33), believed that the bill would help to give encouragement and support to the independent inventor. He said that many important inventions were seriously delayed because of the financial status of the inventor. He felt that the bill would benefit small business because—

> It is not practical at all for a private inventor to contact other than the larger companies, just because of the time involved in trying to physically go around and visit the thousands of smaller companies which may or may not be interested, and that is where an agency such as this could act as a clearinghouse, which would be extremely valuable.

He also said that the 17-year lifespan of a patent was sometimes all used up before the invention got around to production, and then others got the benefit. He thought the bill would have no adverse effect on patent attorneys. He objected to limiting the royalty to 4 percent of the gross income since some inventions are not manufactured in large enough quantities to make 4 percent a profitable return.

(4) *S. B. Fracker*, research coordinator, Agricultural Research Administration, Department of Agriculture (pp. 35–44), approved of the legislation. He told of the Department of Agriculture's policy of favoring unrestricted nonexclusive licensing of inventions developed from federally financed research so long as it brought new discoveries into use. However, the problem of the hesitation of manufacturers to undertake the development of inventions where the original development cost would be considerable is a problem not yet solved. Therefore, he added—

> We are accordingly pleased to note in the committee print of the bill (sec. 6a) that when a patent runs over a year without any license being applied for or issued, the proposed Office of Technical Services would be authorized to issue licenses on a "more exclusive basis."

(5) *Prof. Walter Rautenstraucht*, consulting engineer and member of the faculty of Columbia University (pp. 48–55), approved the bill. He felt that some formula might be found which would establish an equity which perhaps is not established by the mere 4 percent of gross income.

(6) *Senator James E. Murray*, in a statement read by Dr. Dewey Anderson (pp. 71–76), said that the Small Business Committee was greatly in sympathy with the purposes of the Fulbright bill.

This act in essence proposes to build the Astronautics and Space Agency around what is presently the National Advisory Committee for Aeronautics.

My personal reaction is that I find myself in basic agreement with this bill. However, I think the success of the Space Agency will greatly depend on the authority vested in it, and I do not believe under the present NACA charter NACA or its legal successor would be quite prepared to handle a program of this magnitude. I strongly believe that it will be necessary to put a few more teeth into the NACA charter to make it capable of handling this space assignment.

On the other hand, if these teeth are really put into the NACA charter, and if NACA would really be handed the money to run an adequate space program, then I could not think of a better solution, or of a more competent nucleus for a space agency.

Mr. KEATING. Could you be any more specific at this point? I realize that it is perhaps too early for you to say, but could you be any more specific about what you mean by "teeth in it?" Do you mean by that there should be provisions in the legislation which this committee should consider?

Dr. VON BRAUN. Sir, to put it in very broad terms NACA, as the name implies, has so far been an advisory committee for aeronautics which means the emphasis has been on "advice."

In addition to furnishing advice NACA has provided research support for projects carried out by the aircraft industry. This work has been performed in NACA's wind tunnels, structural laboratories, propulsion-test facilities, and so forth.

It is my opinion that if the newly formed National Astronautics and Space Agency is really to run a national space program, it must be given enough authority and an adequate managerial staff to centrally administer such a large and costly program. My feeling is that in order to handle this assignment, the National Astronautics and Space Agency would need a charter like that of the Atomic Energy Commission, in lieu of the charter under which NACA presently operates.

Anything short of that would probably not work out so well. After all, there is a tremendous amount of money involved in these projects, and an adequate administration of this program requires a large program management staff as well as a group of executives who can make decisions, which, incidentally, sometimes may be quite painful.

(2) *Rear Adm. Hyman G. Rickover*, Assistant Chief, Bureau of Ships, for Nuclear Propulsion, Department of the Navy (pp. 221–273), when asked about the type of control, replied:

I definitely believe that the organization should be under civilian control. The Defense Establishment is already too large. If you let it keep on growing, soon it will be controlling the entire country. In fact, rather than putting new

development effort, and, second, if further study bears out our tentative conclusions, a reevaluation of the basic patent policy of the Department of Defense, in the light of current defense problems and the increased participation of Government in research activity, to determine whether Government acquisition of resulting inventions and patents would be more in the public interest.

B. BILLS AND RESOLUTIONS CONCERNED WITH RESEARCH AND DEVELOPMENT—85TH CONGRESS

1. BILLS AND RESOLUTIONS INTRODUCED

a. House Resolution 166, February 14, 1957 (Mr. Thompson of New Jersey)

This resolution would authorize and direct the House Committee on Small Business to conduct a full and complete investigation and study of (1) the amount and proportion of funds distributed by Federal departments and agencies for research and development facilities and work to the various segments of industry and the various sizes and classes of firms; (2) the methods, standards, and criteria being used by the Federal departments and agencies for distributing such Federal funds among various competing firms and sizes and classes of firms; (3) the methods and procedures adopted by the Federal departments and agencies to safeguard the interest of small business in research and development work and to assure broad participation by such firms in federally sponsored and federally aided research and development programs, and the extent of the success of such methods and procedures; (4) the extent to which the award of Federal research and development contracts determines the distribution of Federal contracts for procurement of supplies and services; (5) the extent to which the granting of Federal funds for research and development work influences or determines the employment by small business of scientifically and technically trained research personnel; and (6) the procedures and methods in use by Federal departments and agencies concerning the assignment of patents and the licensing of patented inventions made or developed with the assistance or use of Federal funds.

b. H.R. 6645, April 4, 1957 (Mr. Hill)

This bill would rewrite the Small Business Act of 1953 making certain technical and clarifying changes and converting the Small Business Administration into a permanent agency of the Government. Section 209(d), read as follows:

> For the purposes of aiding in carrying out the national policy to insure that a fair proportion of the total purchases and contracts for supplies and services for the Government be placed with small-business enterprises, and to maintain and strengthen the overall economy of the Nation, the Department of Defense shall make a monthly report to the President, the President of the Senate, and the Speaker of the House of Representatives not less than forty-five days after the close of the month, showing the amount of funds appro-

$5 billion during that year. Of this, programs financed by industry amounted to about $2.3 billion, and programs carried on or financed by the Federal Government amounted to almost $2 billion.

In its sixth report on Federal funds for science, the National Science Foundation estimated that the Federal research and development budget for fiscal 1958 would involve expenditures of $3.3 billion, and Business Week of September 21, 1957, estimated the total spending on research in 1957 at $10 billion.

Much of this research and development work will produce commercially valuable products and processes, which will benefit those concerns able to produce and sell them. Unfortunately for the free competitive enterprise system and in the long run for the national economy, a disproportionate share of the research and development is being done by large concerns, while the small concerns are able to do proportionately little research and development work. The National Science Foundation report on science and engineering in American industry in 1953 shows that only 8.3 percent of manufacturing companies with 8 to 99 employees engage in research and development and only 22.4 percent of manufacturing companies with 100 to 499 employees do so, while 94.3 percent of concerns with 5,000 or more employees carry on research and development. The same report shows that manufacturing concerns with less than 500 employees, which have about 35 percent of manufacturing employment, employ only 20 percent of the total scientists and engineers and account for only about 11 percent of the amount spent on research and development. Concerns with 5,000 or more employees, however, which have about 40 percent of manufacturing employment, employ more than 60 percent of the scientists and engineers and account for almost 75 percent of the research and development expenditures by industry.

The vast amounts spent by the Federal Government on research and development also go overwhelmingly to large firms. The Defense Department, which in 1956 accounted for $1.9 billion of the total Federal expenditure of $2.7 billion, reported only about 6 percent of its research and development contracts were with small-business firms in fiscal 1956. The Atomic Energy Commission, which had the next largest research and development program, awarded only 1 percent of its research and development contracts to small business in fiscal 1953, 1954, and 1955.

The advantages to a concern performing this Government research are considerable. In addition to the assured profit on the contract itself, the concern will receive the inside track on substantial procurement contracts which may result from the research. It will also have advance knowledge and probably extra information about new commercial products which may be developed from the research. It will have built up a staff of scientific personnel familiar with the research and be in the best position to develop commercial applications. And in many cases it will be able to obtain

which have activities in this field will be called upon to cooperate with the Small Business Administration in pursuing these objectives.

This bill will not eliminate the need for other relief for small business concerns, such as tax revisions and measures to provide access to credit. It will, however, serve to reduce substantially one of the handicaps under which small businesses now suffer, and to place them in a more nearly equal position with big businesses in the competitive race for the future. In my judgment, this will be a substantial benefit to the economy of the Nation.

2. *Wendell B. Barnes*, Administrator, Small Business Administration (pp. 560–600), made the following comments on S. 2993.

S. 2993 empowers and directs the Small Business Administration to assist small business concerns in obtaining Government contracts for research and development and in obtaining the benefits of research and development performed by larger firms under Government contracts or at Government expense. Although the Administration is already authorized to provide such assistance, I should welcome the addition to the act of any language which will emphasize the congressional intent in this matter. Such language would serve as a timely declaration that small business must be established as an integral part of the missile program.

The research and development about to be undertaken in that area promises to have widespread effects on our economy. It should generate new processes, new products, and, perhaps, new industries. I should like to see a strong pronouncement from the Congress that, insofar as practicable, small business concerns must be given the invaluable experience that comes from active participation in such work; that, to the extent that they are excluded therefrom, they must be permitted to share in the knowledge acquired by others at the expense of the Government.

In commenting on the contracts awarded during fiscal year 1957, Mr. Barnes said:

Available statistics indicate that in fiscal year 1957, small business firms received only 4.3 percent of the value of military research and development contracts. This low percentage of small-business awards indicates that the scientific knowledge and engineering capacity of small firms are not being utilized to the fullest desirable extent by the Government.

In research and development procurements, Federal agencies seek participation by the best qualified firms, educational institutions, nonprofit organizations, or individuals in order to receive the finest products or studies. The policy places a premium on experience and on superiority of facilities.

The SBA field offices counsel and guide small firms and individuals interested in research and development work, and direct them to the appropriate procurement officials.

the many citizens who inevitably suffered loss of one sort or another during World War II or the national emergency and who were given no compensation therefor. Such an argument, it is believed, if carried to a logical conclusion, would preclude the granting of any relief for the taking of property or for other losses. The U.S. Government, of course, could not provide or attempt to provide relief for all of the casualties of war, financial or otherwise. This fact, however, has not prevented the Congress from granting patent extensions to World War veterans, both after World War I and World War II, nor has it prevented it from making provison for relief for those, having direct contractual relations with the Government, whose position was adversely affected by governmental action. This is exemplified by the statutory provisions for the termination of war contracts. (See, generally, title 41, U.S.C.—Public Contracts.)

Two of the principal examples cited in support of the argument against patent extensions are filling stations, which because of Government controls, could not obtain gasoline, and automobile dealers, who could not secure cars to sell. While such classes of people suffered from the same causes as did patent owners, it must be remembered, however, that unlike patentees, the Government did not agree to secure these persons in any exclusive right, nor did the Government limit the terms of their activities to 17 years. When the actual hostilities of World War II and the Korean conflict were over, filling-station owners or lessees and automobile dealers did not lose their businesses; rather, if they so desired, they could continue and expand their enterprises. They were not required, as is the patentee, at the end of a 17-year period, or at the end of any national emergency, as the case might be, to dedicate their businesses to the public welfare forever.

ESTIMATED APPLICATIONS

Upon request, a representative of the Patent Office furnished the committee with the following statistical data regarding the number of applications for extensions which could reasonably be expected as a result of this legislation. Generally, this legislation would benefit three groups: Section 1(a)(1) relating to veterans and their spouses; section 1(a)(2) relating to patents whose use was curtailed because of Government production controls, and section 1(a)(3) relating to patent owners who granted licenses on a royalty-free basis or at a nominal royalty. The probable number of applications involved, according to the data which follows, would not run into very many thousands.

Section 1(a)(1)—veterans and their spouses—number of cases would be negligible. Laws were enacted in the 81st and 82d Congresses to take care of World War II veterans and there were less than 160 applications under those acts. The only veterans likely to apply under this legislation are Korean veterans.

> This order shall not be construed as terminating the tenure of any person who has heretofore been designated as a member of the Council.[79]

The National Research Council thus has a broader range of membership than the National Academy and is able to coordinate and utilize the research facilities of the principal scientific organizations, educational institutions, and industrial laboratories. The work of the Academy-Research Council is supported in part by private donations, such as the endowment fund given by the Carnegie Corp., and in part by contracts with the Government, foundations, and nonprofit organizations entered into for the purpose of carrying out specific projects.[80]

3. ORGANIZATION

As originally organized, the National Research Council was composed of a Research Information Service, seven divisions dealing with the different sciences, and five divisions dealing with the scientific sections of the Federal and State Governments and international, educational, and industrial organizations.[81] The organization of the Council has gradually changed.

As of December 1958, its setup was as follows:

Office of International Relations.
Office of Scientific Personnel.
Divisions:
Anthropology and Psychology.
Biology and Agriculture.
Chemistry and Chemical Technology.
Earth Sciences.
Engineering and Industrial Research.
Mathematics.
Medical Sciences.
Physical Sciences.

Each of these divisions contains many committees, and persons outside the National Research Council are called upon to serve on them. There are also smaller units, such as the Space Science Board, which report directly to the Governing Board of the Academy-Research Council.[82]

4. PATENT POLICY

The National Research Council in 1924 decided upon the following policy for dealing with inventions resulting from its research:

> Moved: That in the event patentable discoveries are made in the course of work carried on under the auspices of the National Research Council, it is expected that the Fellows or others, on the approval of the Research Council which will defray the cost, will apply for patents on such discoveries as should be protected in the interests of the public and that such patents will be assigned to the National Research Council, and further

[79] 21 Fed. Reg., p. 3155.
[80] R. L. Zwemer, "The National Academy of Sciences and the National Research Council," Science, vol. 108, pp. 234–238 (Sept. 3, 1948).
[81] "Consolidated Report Upon the Activities of the National Research Council, 1919–32," p. 9.
[82] National Research Council.

it had made as the Committee of the Whole and passed H.R. 20975 (p. 4713).

The House of Representatives on February 27, 1915, agreed to sending H.R. 20975 to conference, as was desired by the Senate (p. 4869). On March 2, 1915, the bill was reported from conference committee.[95] Amendment 10 established the Advisory Committee for Aeronautics. The membership agreed to by the Committee was identical to that provided for in the final act which read:

> An Advisory Committee for Aeronautics is hereby established, and the President is authorized to appoint not to exceed twelve members, to consist of two members from the War Department, from the office in charge of military aeronautics; two members from the Navy Department, from the office in charge of naval aeronautics; a representative each of the Smithsonian Institution, of the United States Weather Bureau, and of the United States Bureau of Standards; together with not more than five additional persons who shall be acquainted with the needs of aeronautical science, either civil or military, or skilled in aeronautical engineering or its allied sciences: *Provided*, That the members of the Advisory Committee for Aeronautics, as such, shall serve without compensation * * *

The remainder of amendment 10 was almost identical to Senate Joint Resolution 229 (63d Cong.) with only minor changes in wording.

On March 2, 1915, the House held debate on the conference report, but there was no discussion of amendment 10. On the same day the conference report was approved by the House (p. 5216).

On March 2, 1915, the conference committee recommendations were read to the Senate (pp. 5137–5138), and on March 3, 1915, after some debate, the Senate agreed to the conference report (p. 5251).

President Wilson signed H.R. 20975 on March 4, 1915 (p. 5523), thus establishing what was later known as the National Advisory Committee for Aeronautics.

C. DEVELOPMENT OF THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

1. ORGANIZATION AND DUTIES

After 1915 there were several changes in the membership of the Committee effected by amendments enacted March 2, 1929, June 23, 1938, May 25, 1948, August 8, 1950, and June 3, 1954. As of September 30, 1958, the membership section of the statute read:

> There is established a National Advisory Committee for Aeronautics * * * to be composed of not more than seventeen members appointed by the President. Members shall serve as such without compensation, and shall include two representatives of the Department of the Air Force; two representatives of the Department of the Navy, from the office in charge of naval acronautics; two representatives of the Civil Aeronautics Authority; one representative of the Smithsonian Institution; one representative of the United

[95] 63d Cong., 3d sess. Naval appropriation bill. Conference report to accompany H.R. 20975 making appropriation for the naval service for the fiscal year ending June 30, 1916, and for other purposes (Mar. 2, 1915).

DETERMINATION OF INVENTION

21. *Invention defined.*—The term "invention" as used herein means any art, machine, manufacture, design, or composition of matter or any new and useful improvement thereof, of any variety of plant, which is or may be patentable under the patent laws of the United States.

22. *When and by whom determined.*—NACA headquarters, with the assistance of patent counsel made available by the Department of the Navy or other appropriate agency, will be responsible for determining whether the results of research, development, or other activity within the National Advisory Committee for Aeronautics constitute invention, and where practicable will make this determination before determining the respective rights of the Government and the employee of the laboratory, together with such other information as may be required.

SCOPE OF REGULATIONS

23. *Inventions covered.*—The foregoing provisions of these regulations apply to any invention made by an employee on or after January 23, 1950, and to any action taken with respect thereto, and with regard to such invention supersedes the patent policy of the National Advisory Committee for Aeronautics dated June 30, 1949. As to inventions made before January 23, 1950, the respective rights of the Government and the employee will be determined under the provisions of the patent policy of the National Advisory Committee for Aeronautics approved October 20, 1944, as amended June 30, 1949.

HUGH L. DRYDEN, *Director.*

OCTOBER 1, 1951.

APPENDIX B

NATIONAL AERONAUTICS AND SPACE ACT OF 1958

PROVISIONS RELATING TO PATENTS, INVENTIONS AND CONTRIBUTIONS AWARDS

SEC. 305. (a) Whenever any invention is made in the performance of any work under any contract of the Administration, and the Administrator determines that—

(1) the person who made the invention was employed or assigned to perform research, development, or exploration work and the invention is related to the work he was employed or assigned to perform, or that it was within the scope of his employment duties, whether or not it was made during working hours, or with a contribution by the Government of the use of Government facilities, equipment, materials, allocated funds, information proprietary to the Government, or services of Government employees during working hours; or

(2) the person who made the invention was not employed or assigned to perform research, development, or exploration work, but the invention is nevertheless related to the contract, or to the work or duties he was employed to perform, and was made during working hours, or with a contribution from the Government of the sort referred to in clause (1),

APPENDIX C

Special Acts of Congress Relating to Extensions of Patents

Act of March 3, 1809 (6 Stat. 80, ch. 35).
Amos Whittemore's patent for a machine for manufacture of cotton and wool cards extended for 14 years.

Act of February 7, 1815 (6 Stat. 147, ch. 36).
Oliver Evans' patent for improvements on steam engines extended for 14 years.

Act of March 3, 1821 (6 Stat. 262, ch. 62).
Samuel Parker's patents for improvements in currying and finishing leather extended for 14 years.

Act of March 2, 1831 (6 Stat. 458, ch. 74).
John Adamson's patent for a floating drydock extended for 14 years.

Act of March 3, 1831 (6 Stat. 467, ch. 113).
Samuel Browning's patent for a magnetic separating machine extended for 14 years.

Act of May 19, 1832 (6 Stat. 486, ch. 78).
Jethro Wood's patent for improvements in the construction of a plow extended for 14 years.

Act of June 30, 1834 (6 Stat. 589, ch. 213).
Thomas Blanchard's patent for a machine for turning or cutting irregular forms extended for 14 years. [Amended by act of February 6, 1839 (6 Stat. 748, ch. 14).]

Act of March 3, 1835 (6 Stat. 613, ch. 86).
Robert Eastman's patent for a circular saw clapboard machine extended for 7 years.

Act of July 2, 1836 (6 Stat. 678, ch. 336).
James Barron's patents for improvements in machinery for manufacturing bottle corks, and in pump for air or water, extended for 14 years.

Act of March 3, 1843 (6 Stat. 895, ch. 131).
Extension (apparently for 7 years) of William Gale's patent for improvement in manufacture of silver spoons and forks authorized.

Act of March 3, 1843 (6 Stat. 899, ch. 150).
Samuel K. Jennings' patent for "apparatus for the speedy generation, and convenient, prompt, and agreeable application of heat to the human system" to be renewed for 14 years.

Act of February 26, 1845 (6 Stat. 936, ch. 27).
William Woodworth's patents for improvement in planing, tonguing, grooving and cutting, and for "facing and dressing brick and cutting moldings on, and facing several other substances," extended for 7 years.

Act of May 30, 1862 (12 Stat. 904, ch. 88).
Extension for 7 years of patent of John Goulding for improvement in machinery for manufacture of textiles authorized.

obtaining the benefits of research and development programs conducted at Government expense. These small-business concerns are thereby placed at a competitive disadvantage. This weakens the competitive free-enterprise system and prevents the orderly development of the national economy. It is the policy of the Congress that assistance be given to small-business concerns to enable them to undertake and to obtain the benefits of research and development in order to maintain and strengthen the competitive free-enterprise system and the national economy.

(b) It shall be the duty of the Administration, and it is hereby empowered—

(1) to assist small-business concerns to obtain Government contracts for research and development;

(2) to assist small-business concerns to obtain the benefits of research and development performed under Government contracts or at Government expense; and

(3) to provide technical assistance to small-business concerns to accomplish the purposes of this section.

(c) The Administration is authorized to consult and cooperate with all Government agencies and to make studies and recommendations to such agencies, and such agencies are authorized and directed to cooperate with the Administration in order to carry out and to accomplish the purposes of this section.

(d) (1) The Administrator is authorized to consult with representatives of small-business concerns with a view to assisting and encouraging such firms to undertake joint programs for research and development carried out through such corporate or other mechanism as may be most appropriate for the purpose. Such joint programs may, among other things, include the following purposes:

(A) to construct, acquire, or establish laboratories and other facilities for the conduct of research;

(B) to undertake and utilize applied research;

(C) to collect research information related to a particular industry and disseminate it to participating members;

(D) to conduct applied research on a protected, proprietary, and contractual basis with member or nonmember firms, Government agencies, and others;

(E) to prosecute applications for patents and render patent services for participating members; and

(F) to negotiate and grant licenses under patents held under the joint program and to establish corporations designed to exploit particular patents obtained by it.

(2) The Administrator may, after consultation with the Attorney General and the Chairman of the Federal Trade Commission, and with the prior written approval of the Attorney General, 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 will maintain and strengthen the free enterprise system and the economy of the Nation. The Admin-

lockers for the launching crew personnel. Items of equipment normally included in the weapon-system concept now include the following:

1. Testing equipment of various kinds.
2. Personnel training devices.
3. Ground handling equipment.
4. Firefighting equipment.
5. Shipping and storage containers.

All of these items and others can be and should be developed and manufactured by small organizations specializing in them.

One problem in the weapon-system concept, to which the military admits, is that inclusion of auxiliary and supporting equipment in the weapon system defeats the important objective of standardization. Each prime contractor develops his own equipment. This results in duplication in cost during development, and duplication of supporting equipment in the field.

Thus, it is my conviction that elimination of the extremes presently practiced in the weapon-system contracting method would on the one hand, save money, manpower, and equipment; and on the other hand, make a considerable portion of large weapon work once more available to small business.

It has been our experience that the Small Business Administration and small-business specialists of the military services have been completely ineffective in the research and development field—effective though they may be in manufacturing work. In some 200 to 300 requests for bid which I have reviewed in the past 5 years only 1 research and development project was set aside for small business. The schedule and money involved made it impracticable as a small-business project.

(4) *James T. Duffy, Jr.*, Kellett Aircraft, Willow Grove, Pa., reported the following:

We have been struggling for the past 6 months to keep intact a very capable research and development plant with a sizable engineering department. The total number of men in our organization is approximately 150.

Since large business is taking over the entire systems concept of projects for the Government it makes it even harder for small business to participate in these programs.

(5) *E. F. Pain*, vice president, sales and engineering, Aero Supply Manufacturing Co., Inc., Corry, Pa., described his problem as follows:

I have been reading with considerable interest of your introduction of bill S. 2993 designed to amend the Small Business Act of 1953 to permit participation of small businesses in programs of research and development.

Of particular interest is the provision to assist small-business concerns in obtaining the benefits of research and development performed under Government contracts or at Government expense. As a small-business organization now

research and development activities and (2) specified the purposes for which joint programs for research and development might be developed, these latter being as follows:

> To construct, acquire, or establish laboratories and other facilities for the conduct of research;
>
> To undertake and utilize applied research;
>
> To collect research information related to a particular industry and disseminate it to participating members;
>
> To conduct applied research on a protected, proprietary, and contractual basis with member or nonmember firms, Government agencies, and others;
>
> To prosecute applications for patents and render patent services for participating members; and
>
> To negotiate and grant licenses under patents held under the joint program, and to establish corporations designed to exploit particular patents obtained by it.

Mr. Javits explained the basis for his amendment as follows:

> Mr. President, this is one of the great areas in which small business is at a disadvantage as compared to big business. Big business is going to spend about $8 billion on research and development in the current fiscal year. Interestingly enough, such expenditures are going up 10 percent, while expenditures for plant and equipment have gone down about 30 percent.
>
> Partly by reason of what is stated in the bill and partly from the authority of the Small Business Administration, the cooperative activities can be conducted with complete protection against a violation of the antitrust laws, which is covered by the bill itself, and small business can obtain some of the advantages from research and development which are now obtainable only by large aggregations of capital.

Opposition to Mr. Javits' amendment was expressed by Senator Capehart on two grounds, i.e., that the Small Business Administration already had the authority necessary to lend money to support such programs and that it was undesirable to spell out the authorized activities in this way. He felt the program would not work, that it represented a step toward Government in business and Federal incorporation, and that it trespassed upon rights reserved to the States. He said:

> I do not understand how this would mean anything to a small businessman. What small businessman will join with a half dozen other small businessmen to engage in a program of research? I want the Record to show that this proposal will not work. I tried it once myself, and I know what I am talking about. The only thing I see wrong with it is that we are endeavoring by legislation to provide for a sort of charter which corporations must use in connection with their bylaws in order to do these things, which they have a right to do now. I do not like to set up criteria, or at least I do not like to see the Federal Government set up criteria even by printing that sort of thing in a bill. Corporations have the authority to do these things under the State charters they have received.

Mr. HANISCH. Yes, sir; they have faint ideas that they will realize on what they contribute.

Mr. MACIEJEWSKI. You do want to see this thing finished right now?

Mr. HANISCH. Yes; I would like to see it finished now.

Mr. MACIEJEWSKI. You want to report back to them that there is no chance and no use spending any more money foolishly?

Mr. HANISCH. Yes, sir; that is just it.

(5) *Conway P. Coe*, Commissioner of Patents (pp. 17–19), sent a letter, saying:

> The patents involved expired in 1924, 1925, and 1931, respectively, and the inventions covered thereby have for years been free to the use of anyone. To now revive these patents and establish in certain individuals a monopoly giving them the right to exclude others from making, using, or selling the devices forming the subject matter thereof would inevitably result in injury to the public generally. The bill is subject to the well-known objections to the extension of the patent monopoly beyond the usual statutory period, and does not set forth any circumstances which, to my mind, would justify the extraordinary relief sought.
>
> The enactment of this bill, in my opinion, would establish a dangerous precedent. There would undoubtedly follow a flood of requests for similar legislative relief which, if granted, would lead to utter chaos and confusion in the patent system and in industry generally.

4. COMMITTEE ACTION

The House Committee on the Judiciary issued two adverse reports on July 21, 1940 (H. Rept. 2691 and H. Rept. 2692), on H.R. 9341 and H.R. 7685 respectively. The committee referred to the hearings, noting the several distinct groups, each claiming the right to these expired patents, each seeking to gain their revival and extension, and charging dues or receiving contributions for that purpose. They felt that to withdraw these patents from the public and reinvest them in private ownership would be contrary to public policy, harmful to the general interest, and a dangerous precedent to set.

The committee issued the adverse reports because it had been developed in the hearings that the collection of funds to prosecute the passage of the bills savored of being a racket, and the committee wanted to discourage further collections.

headquarters will be responsible for and with the assistance of patent counsel made available by the Department of the Navy or other appropriate agency, will discharge the following functions:

(*a*) Determine whether the results of research, development, or other activity within the National Advisory Committee for Aeronautics constitute invention within the purview of Executive Order 10096;

(*b*) Determine, subject to review by the Chairman of the Government Patents Board, the respective rights of the Government and of the inventor in and to any invention made by an employee of the National Advisory Committee for Aeronautics;

(*c*) Determine, subject to certain exceptions noted hereinafter, whether patent protection will be sought in the United States by the National Advisory Committee for Aeronautics for such inventions; and

(*d*) Furnish reports as required to the Chairman of the Government Patents Board relating to the determination of rights, the taking of appeals, the filing of applications, and the issuance of patents.

DETERMINATION AND ASSERTION OF RIGHTS

5. *Conditions for assignment.*—The National Advisory Committee for Aeronautics may require assignment of title to inventions made by its employees and to patents that may be issued on such inventions if any of the following conditions are present:

(*a*) If the invention was made during working hours; or

(*b*) If the invention was made with a contribution by the Government of facilities, equipment, materials, funds, or information, or of the time or services of other Government employees on official duty; or

(*c*) If the invention bears a direct relation to or was made in consequence of the official duties of the inventor.

6. *Definitions of conditions.*—In determining whether a condition set forth above was present in the making of the invention, the following definitions shall apply:

(*a*) Working hours shall mean time spent during either the usual working hours, overtime, or both;

(*b*) A contribution of facilities shall mean that the facilities were used in the making of the invention and while so used were made unavailable for other purposes;

(*c*) A contribution of equipment shall mean that the equipment was used in the making of the invention and was thus made unavailable for other purposes;

(*d*) A contribution of materials shall mean that the materials were specifically obtained and used for the purpose of making the invention and were thus rendered unavailable for other use;

(*e*) A contribution of funds shall mean that Government funds were actually expended for the purpose of making the invention;

(*f*) A contribution of information shall mean that the information used in the making of the invention was available only by reason of the inventor's official duties and was obtained from sources not otherwise available;

(*g*) A contribution of time or services of other Government employees on official duty shall mean that their time or services were utilized during working hours as defined in (*a*) above;

By way of example, Mr. Edson wrote:

> At a recent hearing of a private bill before the Senate committee for the extension of a patent which was about to expire, leaving the inventor without any reward for his invention, in the development of which he had spent nearly 30 of the best years of his life and had expended all he was worth when he began, all he had made during the said 30 years, and all that he had been able to borrow from friends and business acquaintenances who had confidence in him personally and in his genius as an inventor, and had nevertheless not been able to place his improvement upon the market, although he now had the promise of capital to do so in view of the recent demonstrations of the practical utility of his improvement, a member of the committee said to the writer: "Do you know of any objection to favorable action on your client's case other than that it would make a precedent upon which to claim favorable action on other applications?"
>
> On another occasion while pressing for favorable action of the House Committee on Patents on a private bill for the relief of a client, Samuel H. Jenkins, who had impoverished himself in efforts to induce capitalists to promote his patent (a bill which like all such bills filed within the last 15 years failed to receive favorable consideration), and having frequently expressed my surprise at not receiving notice of favorable action, a member of the committee finally said to me: "Mr. Edson, you have a good case and your client is justly entitled to have his bill favorably considered, but the fact of the matter is there are plenty of other cases just as meritorious as yours, and if we should act favorably upon your case it would be a precedent for others to follow, and we would soon have more applications then we could possibly consider." I mention these incidents merely to show that the adverse action of the committees of Congress on applications for extensions is not due to their hostility either toward inventors or to a revival of one of the salient features of the American patent system; namely, extensions of patents in proper cases, but is due to the well-grounded belief that if they encourage applications for extensions by making favorable reports on private bills, it would in a very short time be a physical impossibility to hear the number of applications that would be made. I became fully satisfied by my experience that the obstacle to obtaining extension of patents was in the mode of procedure—private bills—and not in the relief sought, and that therefore some general law should be passed which would give some court, board, or commission jurisdiction of the hearing and determination of applications for extensions, and I accordingly prepared and secured the introduction of the two bills as heretofore stated.

Despite the efforts to enact this legislation, these bills were given no further consideration by the Congress, and the act of 1861 remained the law.

Considering now the individual bills:

H.R. 1228 * * * This bill will enable one unconnected with the armed services to profit by an extension of a patent if he can associate himself in title with an inventor in the armed services. It is without time limit and hence introduces a large number of patents for extension. The patriotic reason supporting the act of June 30, 1950, is lacking here. This is class legislation without justification.

H.R. 4944 * * * These bills violate the spirit of the patent laws. A fixed term provides an incentive to a patentee to introduce his product on the market for the benefit of the public irrespective of what obstacles he encounters. These bills encourage a do-nothing and litigious attitude by a patentee.

These bills are not supported by patriotic considerations, for they are not limited to servicemen. * * *

H.R. 2309 * * *. This is class legislation. Additionally, it penalizes the public for an act which the patentee willingly undertook during the period involved, and the act continues to benefit the person which enjoyed the benefits during the period involved, i.e., the U.S. Government and manufacturers for the Government.* * *

H.R. 3534 * * *. The objections to H.R. 1301 and H.R. 4944 presented above are almost equally applicable here.

c. Committee and other action

H.R. 3534 was reported out, with a number of amendments, by the House Committee on the Judiciary (H. Rept. 2347) on July 20, 1954. Amendments included (1) expanding the provisions for extension of veteran-owned patents to include expired patents, but limiting such cases to situations in which use was prevented or curtailed by the veteran's military service; (2) inclusion of patents under which the Government had received a free license in furtherance of the war effort; (3) requirement that an application for extension of a patent in which a veteran held only a partial interest be joined by the veteran; (4) reservation to the United States of a royalty-free right to use the extended patents, except where the owner was entitled to receive royalites for items furnished exclusively to and used exclusively by the United States; and (5) protection of vested rights which might be affected by the extension.

The committee described the basis and need for the legislation as follows:

The restrictions on the use of patents which were caused by * * * emergencies took several forms. The induction of owners of patents into the armed services or the voluntary enlistment of such owners for such service resulted in one form of curtailment of their rights to promote and exploit their inventions. Similarly, the issuance by Government agencies of production stop orders and restrictions in the use of machines, articles, materials, or processes may have substantially curtailed or even entirely prevented the normal use, promotion, or development of patented inventions. Still other situations arose where the owners of patents

Act of February 18, 1875 (18 Stat. 630, ch. 86).
Extension for 7 years of John Hazletine's patent for a new water wheel authorized.

Act of March 3, 1875 (18 Stat. 660, ch. 207).
Extension (apparently for 7 years) of Frederick T. Grant's patent No. 28,470 authorized.

Act of April 29, 1876 (19 Stat. 425, ch. 87).
Extension for 7 years of Harvey Lull's patent for a self-locking shutter hinge authorized.

Act of August 14, 1876 (19 Stat. 491, ch. 281).
Extension for 7 years of John R. Harrington's patent of April 1, 1856, authorized.

Act of March 3, 1877 (19 Stat. 538, ch. 150).
Extension for 7 years of Henry Voelter's patent for improvement in reducing wood to paper pulp authorized.

Act of March 3, 1877 (19 Stat. 551, ch. 207).
Extension for 7 years of Erastus T. Bussell's patent for combined rubber and spiral steel spring authorized.

Act of August 4, 1886 (24 Stat. 873, ch. 912).
Extension for 7 years of Henrietta H. Cole's patent for improvement in fluting machines authorized.

Act of March 3, 1887 (24 Stat. 968, ch. 442).
Extension for 7 years of Samuel M. Gaines' patent for "method of teaching the rudiments of chemistry" authorized.

Act of December 23, 1944 (58 Stat. 1095, ch. 738).
Extension for 7 years of patent granted to Art Metal Works, Inc., as assignee of Louis V. Aronson, for cigar lighter authorized.

○

2. H.R. 2994, JUNE 17, 1943 (MR. HARTLEY)—78TH CONGRESS

Because of the 7 years in which Art Metal was deprived of its rights through judicial corruption, H.R. 2994 was introduced by Representative Hartley to extend the Aronson patent for 7 years.[117]

a. Hearings

Hearings were held before the House Committee on Patents, October 13, 1943. Those appearing included the following:

(1) *Representatives Hartley* and *Keogh* supported the bill, pointing out that because of the unusual circumstances of the case, it would not set a precedent for extending the life of patents. They felt that because Art Metal lost its rights due to corruption in one branch of the Government, it should be granted relief by this act of Congress.

(2) *Kenneth S. Neal*, attorney for Art Metal, recited the history of the litigation with respect to the recovery for damages. The following exchange with Representative Busbey occurred:

> Mr. BUSBEY. A point of information, Mr. Chairman. There are two questions going through my mind. You said that they sold between $10 and $12 million worth of these lighters?
>
> Mr. NEAL. Yes, sir.
>
> Mr. BUSBEY. What is the actual sum that the Art Metal Works recovered from Evans Case?
>
> Mr. NEAL. We entered into a license agreement with them in 1940, which seemed to be the only feasible way of getting anything out of them.
>
> Mr. LANHAM. Whatever you got there, you got under your patent rights?
>
> Mr. NEAL. That's right, sir, due to the restoration, so to speak, which the court of appeals ultimately reinvested us with. We got $50,000 in cash at the closing of that agreement, and we got royalties of * * * 5 percent.
>
> * * * * * * *
>
> Mr. BUSBEY. They are still manufacturing these lighters?
>
> Mr. NEAL. Yes, sir; by our license.

(3) *Attorney General Francis Biddle* opposed the bill, summarizing his objections as follows:

> * * * the proposed bill should not be passed (1) because it would award the patent owner a compensation disproportionate to the damage suffered, for which the patent owner has already voluntarily settled with the infringer; (2) because the burden of the proposed extension would fall upon innocent members of the public who received no benefit from the 1934 decisions, and possibly also upon competitors of the patent owner who may have scrupulously respected the monopoly during its 17-year term, but meanwhile reasonably made plans and investments for production of the patented device after expiration of the patent; and (3) because an undesirable precedent would be set.

[117] H.R. 2994 was a substitute for H.R. 2898, previously introduced by Mr. Hartley on June 7, 1943.

b. H.R. 7685, September 25, 1939 (Mr. Reed), 76th Congress

H.R. 7685 provided that letters patent originally issued to Robinson be "revived and extended in the names of Steve Kalisz and Stella Lakomski, * * * present owners of the same, for further periods of 17 years each from the effective date of this act * * *."

c. H.R. 9341, April 10, 1940 (Mr. Maciejewski), 76th Congress

H.R. 9341 provided that the letters patent "be revived and extended in the name of John T. Hanisch, John J. Komaracki (et al.) * * * each individually and as a fully appointed member of a committee representing some 760 other holders of E. R. Robinson notes for the use and benefit of the said noteholders in proportion to the amount of notes which they hold and for the use and benefit of any other noteholders as their interests may appear, for further periods of 17 years each from their respective dates of their expiration."

3. HEARINGS

Hearings were held May 17, 1940, on H.R. 7685 and H.R. 9341, before a subcommittee of the Committee on Patents of the House of Representatives.

Witnesses included the following:

(1) *Hugo Radau*, Chicago (pp. 3–8), representing Steve Kalisz and Stella Lakomski, owners of five patents originally issued to Elbert R. Robinson, testified in favor of extending the patents. He described how the Car Wheel Association, composed exclusively of Elbert R. Robinson noteholders, got title to the patents and would transfer 49 percent of whatever amount might be recovered, if they were successful at getting this legislation enacted, to the Car Wheel Association.

Representative Edelstein asked,

> What was done in order to have that association to get 49 percent?

Dr. Radau replied:

> The owners of these patents by themselves, that is, Mr. Kalisz and Mrs. Lakomski transferred at their own free will, without any remuneration, and without any promise at all to these noteholders, because it is a fact, the reason why they did, all of them, Robinson in his lifetime did issue these notes which are really all outlawed and do not amount to a row of pins, and he collected about $2,500,000 from people that are very poor. If they have to spend a dollar they feel it. The American Car & Foundry Co., which has used these patents from the very beginning, of course, made an awful pile of money. The noteholders consider, "Well, we contributed $2,500,000 to the inventor, to the patentee, who got at least something, and we did not get a cent, and the notes are bad." We cannot do anything unless somebody buys up the patents for what they are worth. It is only the title. The patents became public property, and they help us save at least some of

the Senate an example. Penicillin was discovered in England long years before it was ever used in this country. We conducted applied research which produced a commercial method of manufacture. But all research has been dominated by one thing—commercialism, the dollar value. That is one thing we should get away from if we can, if we expect to progress. We have bought basic ideas from Germany, and in the buying of them we have surrendered our rights by entering into cartels. We have bought them from England, France, and Italy, and then we have gone ahead with engineering and merely applied them. They will return great benefits to us if we properly apply them, if we give to the young men and women of inquisitive and scientific minds a chance to get an education, if we encourage them to forge ahead and to advance into the unexplored fields of science, the great unknown. Dr. Bush called it the great frontier. No frontier can be adequately maintained unless we have a sufficient number of people to explore it, guard it, protect it, and to advance along the frontier when opportunity demands. Science is the great frontier, but unfortunately we have gone ahead only in those fields which paid dollar dividends. We have spent millions of dollars in discovering a new enamel for refrigerators that will not stain. I think it was the General Motors Corp. which devoted 12 months' time in research because an atmospheric condition in Baltimore caused the enamel on a refrigerator to stain. At the same time no effort was made to do certain other things which might have been done. I do not blame GMC. They are in business for money, and they must take care of themselves. We in the Government are interested in the welfare of all the people, and for that reason we must develop scientists and take care of them.

As for the administration, Mr. Kilgore said:

So, Mr. President, the question of administration is important, because the previous, "part-time" administrations have failed, except in time of war. In time of war men will give their time to their Government, and gladly give it, but in time of peace it is different. It is hard to get men who will devote the time necessary to enable them to go into the most minute details of operating an organization of the size and of the national importance of the proposed Foundation.

Russia has set up a program by which in 5 years she hopes to overshadow the rest of the world in the development of scientists, under a foundation which makes provision for sending potential scientists to school. If we would keep our place in the sun, we cannot depend on the basic research of Germany as we have in the past, we cannot afford to have our business and our defense efforts stultified by being compelled to buy their second-hand manufacturing licenses under their patents. We have to find new methods, new things, new men, and we have to develop the men who can function efficiently in this Nation.

(5) To foster the interchange of scientific information among scientists in the United States and foreign countries;
(6) To correlate its research programs with those of individuals and public and private research groups.

b. Senate Report 1151

The Senate Committee on Labor and Public Welfare reported favorably on S. 2385 (S. Rept. 1151) on April 20, 1948. S. 2385 was amended to correspond identically with H.R. 6007.

4. DEBATES IN CONGRESS

S. 2385 was debated in the Senate on May 3, 4, and 5, 1948. (Congressional Record, pp. 5175–5185, 5250–5252, 5301–5305). Senator Smith discussed his bill (pp. 5179–5183) in relation to the Presidential veto of S. 526. He believed that his bill met the President's objections in regard to the Director, the Executive Committee, and the Divisional Committees. The present bill (S. 2385) differed from S. 526 by making no provision for a division of national defense, and no provision for the creation of an Interdepartmental Committee on Sciences, nor did it specifically establish any named special commissions.

S. 2385 was passed by the Senate by a voice vote.

The bill failed to reach the House floor, so no legislation materialized in the 80th Congress.

F. 81ST CONGRESS (1949–50)

1. BILLS INTRODUCED

a. S. 247, January 6, 1949 (Messrs. Thomas (Utah), Kilgore, Fulbright, Magnuson, Smith (New Jersey), Cordon, and Saltonstall.

S. 247 provided for a Director to be appointed by the President, who would carry out the provisions of this act in accordance with "such policies as the Foundation shall from time to time prescribe." Each contract would contain its own patent provisions.

This bill ultimately became law. Its provisions are set forth in detail, infra, pp. 66–67.

b. H.R. 359, January 3, 1949 (Mr. Celler)

H.R. 359 provided for an Administrator to be appointed by the President to administer the National Science Foundation. It provided for patent rights to be held by the Federal Government, and discoveries to be freely dedicated to the public.

c. H.R. 12, January 3, 1949 (Mr. Priest); H.R. 185, January 3, 1949 (Mr. Harris); H.R. 311, January 3, 1949 (Mr. Wolverton); and H.R. 2751, February 15, 1949 (Mr. Biemiller)

Identical bills, similar to H.R. 6007 of the 80th Congress.

> or any Government official to appoint a committee, commission, or board on aeronautics without authorization of Congress.

The resolutions therefore set up an Advisory Committee for Aeronautics of not over 14 members, of whom 2 would be from the Bureau relating to aeronautics in the War Department, 2 from the Bureau on Aeronautics in the Navy Department, 1 each from the Smithsonian Institution, the Weather Bureau, and the U.S. Bureau of Standards, and not more than 7 others (3 from the District of Columbia and the rest from different States). Section 1 then continued:

> *Provided further*, That it will be the duty of the Advisory Committee for Aeronautics to supervise and direct the scientific study of the problems of flight with a view to their practical solution, and to determine the problems which should be experimentally attacked, and to discuss their solution and their application to practical questions. In the event of a laboratory or laboratories, either in whole or in part, being placed under the direction of the Committee, the Committee may direct and conduct research and experiment in aeronautics in such laboratory or laboratories: *And provided further*, that rules and regulations for the conduct of the work of the committee shall be formulated by the Committee and approved by the President.

Section 2 provided for an annual $5,000 appropriation for the next 5 years and stated that the Committee would make an annual report to Congress.

b. Action taken

Senate Joint Resolution 229 and House Joint Resolution 413 were referred to the Committees on Naval Affairs. Senate Joint Resolution 230 was referred to the Committee on Military Affairs.

No further action was taken on Senate Joint Resolution 229 and Senate Joint Resolution 230, but House Joint Resolution 413 was reported, with amendments, from the Committee on Naval Affairs on February 19, 1915.[91] As a result of the amendments, the introductory clauses of the bill explaining the reasons for the legislation were omitted; the Advisory Committee for Aeronautics was to consist of 12 rather than 14 members; and restrictions with respect to the locality from which Committee members were to be chosen, were deleted. The report quoted statements expressing the approval of the Navy Department and the recognition of the need for such a committee by the Board of Regents of the Smithsonian Institution. The Committee on Naval Affairs explained that, in addition to studies outside the Government, the status of aeronautical research was as follows:

> Although the U.S. Government is equipped for doing much of the work of investigation in the development of aviation, there is no correlation of the work of the various governmental agencies. The Bureau of Standards is equipped for

[91] House Committee on Naval Affairs, 63d Cong., 3d sess., National Advisory Committee for Aeronautics, Rept. 1423 to accompany H.J. Res. 413 (February 19, 1915).

5. H.R. 4304, JULY 21, 1947 (MR. LEWIS)—80TH CONGRESS

This bill was similar to H.R. 1190 of the 79th Congress. It was reported out by the House Committee on the Judiciary, with two minor amendments in wording, on February 9, 1948 (H. Rept. 1360). The committee referred to the hearings which were held the previous session, saying:

> Representations were made and were seriously considered by the committee that the benefits of such legislation should inure to all patentees who suffered losses by reason of being unable through shortages of materials or other reasons during the war to prosecute and exploit their patent rights. The committee, however, felt that to provide relief for all such persons who suffered losses in this manner would be to overlook the many thousands of persons in other walks of life who suffered grievous and irreplaceable losses in their fortunes because of the circumstances of war. For most of such persons no governmental relief has been or could reasonably be afforded, for such conditions cannot reasonably be considered by thinking persons the responsibility of the Government to restore.
>
> As to veterans of World War II, however, the committee could perceive a reasonable and logical distinction, for in these cases the circumstances of the removal of the patentees from the scenes of their livelihoods and occupations, and the involuntary (in most cases) nature of their having military or naval duties thrust upon them, effectively deprived them of their freedom to exploit their patent rights even if materials, etc., had been available. Of course, there were many whose patents produced a steady and undiminished income during their absence in service, but as to these the bill makes adequate provision.
>
> The bill further carefully protects the innocent persons who might unwittingly and legally be manufacturing a patented invention after the expiration of its original term and then finds that the extension of the period creates a technical infringement. In such cases the continued manufacture is permitted, subject only to the payment of a reasonable royalty.

This bill passed the House on March 1, 1948 (Congressional Record, p. 1938), but no action was taken in the Senate.

6. OTHER BILLS OF THE 80TH CONGRESS

H.R. 4511, November 18, 1947 (Mr. Sabath).
H.R. 5452, February 17, 1948 (Mr. McGarvey).

7. PUBLIC LAW 598 (81ST CONG.), JUNE 30, 1950

Public Law 598 [115] had its origin in H.R. 4692, introduced on May 16, 1949, by Mr. O'Hara. It was similar to H.R. 4304 (80th Cong.). Hearings were again held by a subcommittee of the House Judiciary Committee; witnesses testified pro and con. The House Committee

[115] 64 Stat. 316 (1950), 35 U.S.C. sec. 115 (1952).

Now, I do not believe that my own experience is at all unique and therefore I will illustrate the point by reference to my FM inventions. You all know we now have radio without static; that we have coast-to-coast transmission of television signals; that police, fire, and emergency vehicles keep in constant touch with their headquarters by radio, and that may hundreds of long-distance telephone conversations travel between cities over a single beam and that those radio beams are rapidly replacing wires. All of those services are based on the radio system that eliminates static from the signal, popularly known as FM.

Now, when I invented the system of frequency modulation which produced noise-free radio signals, many others had been working in that field, among them the largest and best radio laboratories in the world—General Electric, Westinghouse, RCA, the American Telephone & Telegraph Bell Laboratories, and the great German Telefunken Co.

Their results were entirely negative. The general opinion among radio engineers about the possibility of a static eliminator was expressed by John R. Carson, the telephone company's ablest mathematical physicist, who wrote in a technical journal in 1928, and demonstrated mathematically, that the problem of static was insoluble. Now I quote from his conclusion:

"As more and more schemes are analyzed and tested, and as the essential nature of the problem is more clearly perceived, we are unavoidably forced to the conclusion that static, like the poor, will always be with us."

That was in the proceedings of the Institute of Radio Engineers in 1928, just 5 years before static was eliminated.

* * * * *

On another occasion, commenting on frequency modulation, in which the solution of the noise problem was found, Mr. Carson stated that frequency modulation "inherently distorts without any compensating advantages whatsoever." That statement, of course, was approved by the management of the greatest communications company in the world, the American Telephone & Telegraph Co., because no statements go out until they are approved by the patent department of that corporation—or of any other of the large corporations, for that matter.

When the problem was finally solved, and the static in broadcasting reduced 1,000 to 1, it was in a small university laboratory, with a staff consisting of one laboratory assistant and one secretary and myself, at the Marcellus Hartley Laboratory at Columbia University.

I have heard recently of a case where a development now used in jet-airplane engines was made by a single metallurgist with three or four laboratory assistants, after the largest metallurgical laboratories specializing in that particular field—laboratories maintained by two of the largest corporations in the country—had worked on the job and reported that it was impossible of accomplishment.

could be drawn out with profit, especially where development is left to private enterprise.

> The complaint of those who think that some of the proposals with respect to patents overshoot the mark is that they are going to make it impossible for private enterprise to operate on the proposed terms.

He presented the following intersociety committee findings: 63 percent were for a single administrator; 18 percent for a 48-man commission; 48 percent prefer inclusion of social sciences; 86 percent believe in granting undergraduate scholarships; 94 percent believe no special stand should be taken on patent legislation.

(5) *Charles E. MacQuigg*, director of the Engineering Experiment Station of Ohio State University and chairman of Ohio Water Resources Board (pp. 68–73), declared that his group favored a board and favored scholarships. He believed that research should be on the widest geographical basis and that social sciences should not be mixed in the same legislation.

(6) *Frank Jewett*, President, National Academy of Sciences (pp. 73–111), speaking for himself, was opposed to Federal support. He believed the traditional channels were good enough.

> So on two scores I am skeptical: First, as to the premise on which the necessity for this foundation scheme is based, and, in the second place, I am very doubtful as to whether the people of the United States, for the money which is spent in this particular sector, will get as much value out of their dollars as they would get were they in a position to make the expenditures directly in the traditional way.

(7) *William A. Higinbotham*, executive secretary of the Federation of American Scientists (pp. 111–119), said that:

> Science foundation legislation should have two primary objectives:
> First, to make sure that scientifically inclined American youth have an opportunity to develop their talents; and
> Second, to support and extend basic scientific research.

(8) *George E. Folk*, special adviser to the National Association of Manufacturers committee on research and patents (pp. 123–134), said that the NAM approved legislation along the lines of Dr. Bush's report.

> The NAM favors in principle legislation for creating a National Science Foundation along the lines recommended by Dr. Vannevar Bush in his report entitled "Science, the Endless Frontier." It believes that the Foundation should have certain characteristics found in the four identical bills, H.R. 1815, 1830, 1834, 2027. Those features especially approved are—
>
> (1) A relatively simple organization consisting of persons well versed in the specified fields which are included in the Foundation's activities.
>
> (2) The selection of such members of the Foundation solely on the basis of established records of distinguished service.

(2) the practice of the inventions described and claimed in any unexpired patent of the United States was prevented or curtailed by any order of an agency of the Government prohibiting or limiting the production or use of any class of machines, articles, or materials, or the use of any class of processes or formulas,

then the term of such patent may be extended in accordance with the provisions of this act.

* * * * *

(d) The periods during which one or more of the circumstances described in subsection (a) must have occurred in order to qualify a patent for extension under this act are as follows:

(1) The period beginning May 27, 1941, and ending December 31, 1945.

(2) The period during which the Selective Service Act of 1948 or the Universal Military Training and Service Act is in effect.

(3) The period during which title I of the Defense Production Act of 1950 is in effect.

H.R. 4944, April 30, 1933 (Mr. Utt). It was similar to H.R. 323 (82d Cong.), described supra, p. 164.

b. Hearings

Hearings were held on the above bills, before Subcommittee No. 3 of the Committee on the Judiciary, House of Representatives, on June 10, 1953.

(1) *Hamer H. Budge* (pp. 10–11) spoke in favor of H.R. 1228, contending that the extension privilege should be available to the person who retained a substantial interest in his patent even though he had made an assignment thereof, just as though he were the sole owner as specified under present law.

(2) *Irving Potter*, president, Patent Equity Association, Inc. (pp. 12–27), testified in favor of H.R. 3534. He pointed out that the constitutional provision allowing the grant of patents for limited times did not speak in terms of "limited times during peace," or "limited times to be abridged during war." He described the hardships his company endured because of Government stop orders during the war. He pointed out that, although the Potter refrigerator was developed by his company, other manufacturers made millions on the invention, while his backers had their business entirely wiped out due to Government stop orders.

(3) *William R. Ballard*, National Association of Manufacturers (pp. 37–40), opposed H.R. 1301, 2309, and 3534, on the ground that they would have the following bad effects on the patent system:

(1) From the fact that owners of patent rights—one species of property—would be singled out for preferred treatment, which is unfair to the owners of other kinds of property; (2) from the resulting uncertainty as to the expiration date of patents, and the consequent difficulties for business enterprises in planning their future activities; and (3)

from the further overloading of the Patent Office by a flood of applications for extension, to the detriment of its important business of handling applications for patent.

(4) *Willard Hayes*, chairman, Committee on Laws and Rules, American Patent Law Association (pp. 46–50), presented the objections to the bills by his association, which ran along the same lines as previous testimony.

(5) *Dr. Edwin Armstrong* (pp. 64–71) eloquently described the patent system as follows:

> In the previous hearings Abraham Lincoln was quoted as having said that "The American patent system added the fuel of self-interest to the fire of genius". To my mind that statement expresses the true function of the patent law in our economic system—to provide incentives for the making of inventions.
>
> Many people who would agree with that statement, however, do not look beyond the making of a single invention and rewarding the inventor for it. I suggest that there is a good deal more than that to the matter of providing incentives. From the standpoint of the individual inventor, the important thing about rewarding the inventor is to provide him with the resources with which to make the next invention. That is the aspect of the matter that is of public importance. For if inventions were ever needed, they are needed now, world conditions being what they are.
>
> The test of any proposal affecting the patent law is whether it will serve as a spur to invention. Applying that test to the proposal which is before your committee, I think it is a meritorious proposal. It would provide a good many inventors, I believe, with the means with which to go on inventing. And last, and perhaps most important, it would assure the inventors and potential inventors of the country that the Congress is mindful of the importance of their work and wants them to reap their due reward—not for the sake of the reward but for the sake of going on and making other inventions.
>
> There are those nowadays who belittle the role of the individual inventor and say that research has become so complicated and so expensive that it can only be carried out by large laboratories, such as those maintained by the major industrial organizations. That is not in accord with experience. Many inventions, of course, come out of the industrial laboratories, and there are certain types of problems which only they can work on effectively, because of the amount of money involved. But in the many fields where the capital requirements are not too great, it has been proven over and over that man for man and dollar for dollar, the individual inventor repeatedly outstrips organizations with hundreds of times the manpower and numberless times the financial resources. My point is not that either kind of inventive effort must give way to the other; my point is that the country needs both kinds of effort.

(3) That in the selection of members of the Foundation due consideration shall be given to recommendations for nominations made by the National Academy of Science or by other scientific organizations.

(4) That the chief executive officer of the Foundation, shall be a director selected by an executive committee of that Foundation which shall prescribe the powers and duties of the Director and which powers and duties shall be performed under the supervision of the committee.

There are certain provisions of these four bills which are open to adverse criticism. They are—

(1) Including among the possible membership of the Foundation those qualifying merely as leaders in "educational or public affairs."

(2) Including "educational organizations," merely as such, among those organizations whose nominations must be given due consideration.

(3) The inclusions of "other sciences" as fields in which the Foundation is authorized to initiate and support scientific research.

(4) The broad inclusion of "personal property of all kinds," which would include patents, as subject to condemnation by the Foundation even where such patents results from research by independent inventors.

(5) The indefiniteness in section 11(b) of the phrase "if patented" since the inventions may be patented either in the United States or in foreign countries or in both.

(6) In making it possible to ignore the civil service laws in the appointment of permanent employees of the Foundation.

Turning now to the Celler bill, H.R. 942, which is identical with the Kilgore bill, S. 1850 * * * the NAM cannot view H.R. 942 with approval since it departs to such an extent from the original concepts of what was deemed necessary to carry out the fine objectives of Dr. Vannevar Bush. This is because the new measure contemplates—

(1) A large organization imposed, in part, upon advisory boards—a large organization which has implications of political patronage.

(2) A board of scientists with only advisory powers and without authority which would not attract top scientists of the country.

(3) Giving the President of the United States very broad powers, under which he could, if he so desired, interpret the broad objectives of the bill as he wished. The political implications of this and the possible danger to the school system, science, business, and our economic system in general are obvious.

(4) The danger of channeling research through the determination by a director of this important body of what in his estimation should or should not be undertaken, for, as the Rev. J. Hugh O'Donnell, President of the University of Notre Dame, has so well stated:

So I say that the function of the individual must not be underestimated, and that the provision of liberal incentives for him is a matter of public importance.

There are some other considerations affecting the rewards of inventors that your committee may want to take into consideration.

In many cases the 17-year life of a patent is purely theoretical. It takes time for a new invention to be accepted, especially if it is important and would involve major changes in industry practices or installations. My FM patents, for example, were issued in December 1933. They were greeted by the industry with skepticism, and it was 5 or 6 years before it was generally accepted that the FM system would do what I said it would, and it was 1939 before I received a cent of royalties under the patents. So in measuring the effect of war restrictions in that kind of a situation, the effective life of the patents is really about 10 years, instead of 17.

There is another point that I just want to pass over briefly. That is that quite a number of patentholders gave free licenses for Government purposes during the prewar emergency period and the war. In my case, I initiated that policy in the radio field in March of 1941 by giving a free license to the Army and the Navy; and there was a quarter of a billion dollars of equipment made during the period of the war, from those.

I would like for the record to show that the FM system was used universally in all mobile communications of the U.S. Army during World War II, and was employed with great effectiveness during the later amphibious operations in both the eastern and European theaters of war.

There is another problem to which the representatives of the American Patent Law Association did not direct your attention. On account of the numerous fields where Government controls operate, an inventor may have his reward diminished or reduced to zero by bureaucratic fiat. While my own experiences may not be typical, at least it is illustrative of problems that are increasing for the inventor.

My FM system had been tested and demonstrated and was ready to go into public use before 1936. But in 1936, when the Federal Communications Commission was called upon to provide wavelengths for it, the assignment in the then usable part of the radio spectrum was only five channels. Nothing remotely approaching a nationwide system of FM broadcasting could be built upon five channels; and there—and for the further reason that the service was made "experimental," so that nobody could derive a cent of revenue out of it—the Commission deprived it of all immediate commercial attraction to the big broadcasters.

Hence, the large interests in broadcasting stood pat, and left it to the inventor and some of the less favored broadcasting interests to exploit the FM system. It was not until May 1940, that the Commission made FM broadcasting "commercial" and assigned additional (but still insufficient) radio channels to it.

on the Judiciary issued its report on August 8, 1949 (H. Rept. 1214), and the Senate on October 17, 1949 (S. Rept. 1190). H.R. 4692 passed the House on August 15, 1949, and the Senate, with amendments, on October 18, 1949.

As the Senate passed the bill, it extended the term of patents held by members of the armed services for an additional amount of time equal to the amount of time they spent in the services. On the other hand, the bill, as passed by the House, would have extended the term for twice that long. A conference was held (H. Rept. 1880), and the conferees agreed with the position taken by the House of Representatives, and on June 19, 1950, the House and Senate agreed to the conference report. H.R. 4692 was signed into law on June 30, 1950, becoming Public Law 598. One hundred and thirteen patents were extended under this act.

8. OTHER BILLS INTRODUCED IN THE 81ST CONGRESS

Other bills introduced in the 81st Congress, but on which no action was taken, included—

H.R. 98, January 3, 1949 (Mr. O'Hara).
H.R. 3135, March 1, 1949 (Mr. McConnell).
H.R. 4071, April 7, 1949 (Mr. O'Hara).
H.R. 4155, April 9, 1949 (Mr. Gorski).
H.R. 8884, June 21, 1950 (Mr. Walter).
H.R. 9366, August 9, 1950 (Mr. Reed).
S. 1854, May 13, 1949 (Mr. Douglas).

9. PUBLIC LAW 437 (82D CONG.), JUNE 1, 1952

Public Law 437 [116] had its origin in S. 1537, introduced by Mr. Magnuson on May 23, 1951. H.R. 4413, introduced by Mr. O'Hara on June 12, 1951, was considered at the same time. The purpose of these bills was to amend Public Law 598 (81st Cong.). Under that law, a veteran received the benefits incident to the extension of his patent provided he were the sole owner of the patent. This amendment would extend that coverage to veterans who owned patents jointly with their spouses.

S. 1537 was reported out in S. Rept. 1441 and H.R. 4413 in H. Rept. 1716. S. 1537 passed the Senate on May 1, 1952. The House passed H.R. 4413 on May 5, 1952, and the amended S. 1537 on May 15, 1952. It was signed by the President on June 1, 1952.

C. POST-WORLD WAR II AND KOREAN CONFLICT

1. BILLS INTRODUCED IN THE 82D CONGRESS, UPON WHICH HEARINGS WERE HELD

a. Provisions

H.R. 323, January 3, 1951 (Mr. Reed of Illinois). It provided:

> that the term of any patent shall be extended to such extent as the normal use, exploitation, promotion, or development of such patent has been prevented, impaired, or delayed by reason of—

[116] 66 Stat. 321 (1952), 35 U.S.C. sec. 118a (1952).

> testing of material and structural forms used in aircraft and for standardizing physical instruments used in air navigation. The U.S. Weather Bureau studies and reports on aeronautical meteorology and has an extensive library of works relating to or allied to aeronautics and is equipped with instruments capable of mapping air currents throughout the United States and waters along its coasts. The War and Navy Departments have aeronautical libraries and purchase and equip flying machines for national defense. Each of these departments have attachés in the various countries to report on the development of aviation abroad (p. 1).

It then stated:

> In view of the fact that the establishment of such a committee would be in the line of the best practice of European nations, all of which have made remarkable progress in aviation under the spirit of cooperation of governmental and private agencies and in view of the fact that at present there is no coordination of the agencies, resources, facilities, or activities of the Government in the development of aviation or with private enterprise, the committee recommends the enactment of the joint resolution as amended (p. 2).

No further action was taken on House Joint Resolution 413. On March 3, 1915, however, Congressman Thomas S. Butler stated that the provisions of the resolution were covered in the naval appropriation bill, H.R. 20975, which had been passed by the House.[92] This bill is discussed below.

2. ACT OF MARCH 4, 1915, CREATING THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

a. H.R. 20975, reported January 16, 1915 (Mr. Padgett)

H.R. 20975 in its original form contained an appropriation for aeronautics but no provision for an advisory committee. On February 22, 1915, however, it was reported from the Senate Committee on Naval Affairs with amendments.[93] Among the amendments was one setting up an Advisory Committee for Aeronautics. The proposed membership of the Committee was almost identical to that provided in Senate Joint Resolution 229 (63d Cong.), but there were to be no more than 10 members and the 3 persons not holding specific positions were to be "acquainted with the needs of aeronautical science, either civil or military, or skilled in aeronautical engineering or its allied sciences." One of these members could be from the District of Columbia, while the others were to be from different States. The duties of the Committee were identical to those set forth in Senate Joint Resolution 229.

b. Action taken on H.R. 20975, and enactment thereof

On February 25, 1915, the Senate, acting as Committee of the Whole, approved the amendment establishing the Advisory Committee.[94] On February 26, 1915, the Senate agreed to the amendments

[92] 52 Congressional Record, p. 5461.
[93] 63d Cong., 3d sess., Naval appropriation bill, Rept. 1021 to accompany H.R. 20975, Feb. 19, 1915.
[94] 52 Congressional Record, p. 4601.

d. H.R. 1845, January 25, 1949 (Mr. Van Zandt), and H. R. 2308, February 3, 1949 (Mr. Mills)

Identical bills, similar to S. 247, supra.

2. HEARINGS AND SIGNIFICANT TESTIMONY

Hearings of the House Subcommittee of the Committee on Interstate and Foreign Commerce were held on March 31, April 1, 4, 5 and 26, 1949, on the above bills.

Letters were submitted from the various Government agencies, all favoring the establishment of a National Science Foundation. Comments again centered upon administration, patent policy, inclusion of social sciences, and the geographic distribution of funds. Most of the witnesses had presented testimony at previous hearings, and the overwhelming majority were for the establishment of the Foundation. Hon. Fritz G. Lanham; John W. Anderson, president, National Patent Council, Gary, Ind.; O. W. Storey, engineer, Illinois; A. G. Dixon, Modine Manufacturing Co.; and other businessmen and engineers objected to the bills on various scores. Most of them felt that Government control would stifle initiative and that there was not sufficient safeguard to prevent the Foundation from carrying on applied research. Some went so far as to say that the bill is "alien inspired" and that it might benefit enemies by impairing the effectiveness of our industries.

3. REPORTS

The House Committee on Interstate and Foreign Commerce favorably reported out H.R. 4846 (H. Rept. 769) on June 14, 1949. The Senate Committee on Labor and Public Welfare reported out S. 247 (S. Rept. 90) on May 3, 1949.

4. ACTION IN CONGRESS AND PRESIDENTIAL APPROVAL

The Senate voted in favor of S. 247 on March 18, 1949, and the House passed S. 247 in lieu of H.R. 4846 on March 1, 1950. A conference was held to reconcile the differences between the two Houses. An agreement was reached in conference report 1958. The final bill was passed and sent to the President on May 1, 1950. He signed it on May 10, 1950, and it became Public Law 507 the same day.

G. PROVISIONS OF PUBLIC LAW 507 (MAY 10, 1950)

Public Law 507 provides that the Foundation should develop and encourage the pursuit of a national policy for the promotion of basic research and education in the sciences; that it should initiate and support basic scientific research in the mathematical, physical, medical, biological, engineering, and other sciences, by making contracts or other arrangements (including grants, loans, and other forms of assistance) for the conduct of such basic scientific research and to appraise the impact of research upon industrial development and upon the general welfare; to conduct research in national defense; to award scholarships and fellowships in the sciences; and to avoid undue concentration of research and education.

> As I said before, the scientists in colleges and universities have their work cut out for them. They are 7-day-a-week men. The scientists in the large laboratories, except the executive types, have their work cut out for them, and one of their first tasks is to see that their laboratories do not get into a jam by losing any patent rights.

Much discussion took place on the need for scientists, and many amendments were presented to S. 526. Two important amendments agreed to were (1) Mr. Morse's amendment that not less than 25 percent of the research activities be apportioned among the States—two-fifths to be apportioned among the States in equal shares, and the remainder in proportion to the States' population, and (2) Mr. Magnuson's amendment that the Director be subject to the supervision and control of the executive committee, but that he be appointed by the President.

Some of the amendments that were rejected were (1) Mr. Kilgore's amendment that mandatory amounts be distributed to the various States; (2) Mr. Kilgore's amendment that patents should be freely dedicated to the public and that the Government should obtain patent rights on research financed by the Government; and (3) Mr. Fulbright's amendment to include the social sciences.

S. 526 passed the Senate on May 20, 1947, by a vote of 79 to 8.

On July 21, 1946, a conference report (H. Rept. 1020) reconciled the differences between the Senate and the House bills. The basic provisions of the House bill were retained. This conference report was submitted in both Houses and agreed to.

e. Presidential veto of S. 526

President Truman stated in a memorandum of August 6, 1947, that he had vetoed the bill with great reluctance for he was convinced of the urgent need for the establishment of a National Science Foundation, but he felt that the bill passed by Congress vested the determination of vital national policies and the expenditure of large public funds in a group of individuals who would be essentially private citizens. This, the President stated, was a marked departure from the sound principles for the administration of public affairs, a departure to which he could not give his approval.

E. 80TH CONGRESS, 2D SESSION (1948)

1. IMPORTANT BILLS INTRODUCED

a. H.R. 6007, March 25, 1948 (Mr. Wolverton)

H.R. 6007 provided for a Director to be appointed by the President who would act in accordance with rules prescribed by an executive committee. It provided that each contract should contain provisions for disposition of inventions. Funds were to be distributed solely on the basis of ability with no provision for 25 percent distribution throughout the States. There was no provision for inclusion of the social sciences.

the money which we invested. Kalisz and Lakomski did do that. They bought up these patents from the heirs of Stanley Hoffman, and they are here asking this committee to renew them. So, they are willing, although they paid their own money for these patents, to give 49 percent if anything is recovered. We have not gotten anything yet, but if anything is recovered, 49 percent goes to the noteholders.

(2) *Steve Kalisz*, (pp. 8–13) was questioned about the financial arrangements of the Car Wheel Association. There was an initiation charge of $3 per member and a charge of $1.50 every month. Mr. Edelstein commented that to organize an association and get a $3 initiation fee and a $1.50 a month from—

each one of these persons with the hope that a bill might be passed * * * does not appeal to me, and I have been practicing law in New York where we have a large foreign element, and in my opinion it is simply not right.

(3) *Representative Anthony F. Maciejewski* (pp. 13–14) said:

My main object in introducing this bill is to try to stop those collections of money throughout my entire district. There was something like 9,000 original noteholders and the people claimed they had rights in this so-called patent or patents. Out of that I understand there are only 1,700 left. * * *

The statement was made that something like $2,500 000 has been collected. It was collected out of people of very small means, people out there that are poor. I am told that 80 percent of those people are hard-working people. Americans of Polish descent, and who are living on hopes that some day they might be able to get these moneys back that they have paid in there, and they continue giving, and giving, and for that reason, as I said, I would like to get a decision in my bill H.R. 9341, and regardless of how this committee is going to act on it I am going to give it proper publicity in that community and try to stop the collection of money once and for all.

(4) *John T. Hanisch* (pp. 14–16) told of the group he represented. They had no organization, nor dues, but voluntary contributions. He said:

Three-fourths of the people in the organization have the original Robinson notes, that is, they bought the notes originally from him. Others bought them through other hands. I bought my own through other hands. The purpose of my being here is that we want to clear this thing up once and for all. It is getting to be an awful mess. It smells from afar, and if nobody does anything about it now this thing will grow into one of the biggest rackets, as big as the Drake estate.

Mr. EDELSTEIN. When you say it smells you mean that people are being pepped up with the idea that sometime they will realize on it?

(4) A letter from *Henry Lederer & Bro.*, a jewelry corporation, said that extending the life of the patent would deprive Lederer and others of rights to commence manufacture of the lighter.

(5) *The American Patent Law Association* asked the question, if the judiciary had been culpable and the patent owner had suffered a loss, "could not the amount of this loss be ascertained and a private bill for 'liquidated damages' introduced, in order to redress the owner of the reissue patent?"

(6) *Other opposing witnesses* included Conder C. Henry, Assistant Commissioner of Patents, and the American Bar Association.

b. Committee and other action

Both the House and Senate committees reported favorably on H.R. 2994 (H. Rept. 1433 and S. Rept. 1277). The House committee felt that the equities in favor of the owner heavily outweighed arguments advanced by opponents. The committee was of the view that the legislation was without precedent in the history of patent legislation and that no comparable future situation would ever arise. Since the owner was wrongfully deprived of his rights because of wrongful acts of an agency of the Government, the Congress properly might restore those rights by the enactment of this bill.

The bill passed both Houses and was signed into law December 23, 1944, as Private Law 554, extending for 7 years the term of the patent.

B. ELBERT R. ROBINSON PATENTS

1. BACKGROUND

A number of bills were introduced over a period of years to revive and extend for a period of 17 years from the date of passage of the act, a number of long-since-expired patents originally granted to Elbert R. Robinson, deceased. The purpose of the legislation was to provide means for possible compensation to some thousands of noteholders who had supplied funds to Robinson to carry on suits charging infringement of the patent. Because these noteholders were hopeful of receiving some return on their notes, and were paying fees or contributing money for this end, the Committee on Patents wished to settle the situation once and for all.

2. BILLS INTRODUCED

a. Bills introduced in the 74th and 75th Congresses

H.R. 8015, May 10, 1935 (Mr. Reed), 74th Congress.
H.R. 12982, June 15, 1936 (Mr. Reed), 74th Congress.
S. 4783, June 16, 1936 (Mr. J. H. Lewis), 74th Congress.
H.R. 5748, March 17, 1937 (Mr. Reed), 75th Congress.
H.R. 6980, May 11, 1937 (Mr. Andresen), 75th Congress.
H.R. 6009, March 30, 1937 (Mr. Andresen), 75th Congress.
S. 2908, August 4, 1937 (Mr. J. H. Lewis), 75th Congress.
No action was taken on any of these bills.

CONSTRUCTED ASSESSMENT OF QUALITATIVE RESEARCH

furthered the interests of the United States and materially assisted in promoting the war effort or defense programs by granting licenses to the Government to use their patents without payment of royalty, or for a nominal royalty, even though the granting of such licenses prevented or substantially curtailed the normal use or exploitation of the patents.

* * * * *

To justify legislation for the extension of the terms of patents on the ground that national emergencies such as World War II and the Korean conflict resulted in the substantial loss of opportunities for the exploitation of such patents, the fundamental distinction must be recognized between the loss of such opportunities for patent exploitation and the numerous kinds of other economic losses suffered by various classes of citizens as a result of such emergencies. The measures taken by the Government in the interest of national defense necessarily caused indirect losses of varying degrees on numerous groups of citizens, creating situations for which there can be no compensation or other remedy provided by Federal legislation. * * *

Yet this general situation affords no justification for not compensating individuals from whom the Government has appropriated specific property. The Government stands in a special relation to such individuals and compensation is paid for property rights taken. In principle, the Government would have no more justification to abridge the special obligations it has assumed in inducing the disclosure and public dedication of inventions in exchange for the Government's assurance of a 17-year period for the exclusive use of such inventions.

H.R. 3534 passed the House on July 27, 1954 (Congressional Record, p. 12303).

The Senate reported out H.R. 3534 (S. Rept. 2265), but when it reached the Senate floor, it was objected to by Senator Gore, and the bill was not voted on.

4. BILLS INTRODUCED IN THE 84TH CONGRESS, UPON WHICH HEARINGS WERE HELD

a. Provisions

H.R. 2128, January 13, 1955 (Mr. Fisher of Texas). It was identical to H.R. 3534 (83d Cong.), authorizing the extension of patents covering inventions whose practice was prevented or curtailed during certain emergency periods by service of the patent owner in the Armed Forces or by production controls.

H.R. 3134, January 26, 1955 (Mr. Reed). This bill was similar to H.R. 1301 (83d Cong.).

H.R. 4700, March 7, 1955 (Mr. Utt). This bill was similar to H.R. 4944 (83d Cong.).

II. GENERAL EXTENSIONS NOT INVOLVING WAR CONDITIONS

A. PROPOSALS DURING THE 1930's

There have been almost no proposals in recent times for a general extension of patents, apart from those resulting from war conditions. Two exceptions to this rule are as follows:

1. S. 1591, May 1, 1933 (Mr. Copeland)—73d Congress, provided:

> That any letters patent which were unexpired on March 4, 1933, and have not subsequently expired, are hereby extended for a term of five years after the date now fixed by law for their expiration;
>
> Any letters patent which have expired subsequent to March 4, 1933, are hereby renewed and extended for a term of five years after the date of their expiration.

2. S. 2775, May 7, 1935 (Mr. Johnson)—74th Congress, provided:

> That all letters patent granted for any process of fermentation are hereby renewed and extended for a period of time equal to that part of the term of such patent that fell within the period the eighteenth amendment to the Constitution was in effect.

III. GENERAL EXTENSIONS UNDER WAR CONDITIONS

A. WORLD WAR I

1. H.R. 13043, JUNE 24, 1926 (MR. VESTAL)—69TH CONGRESS

H.R. 13043 provided for extension of the patents of veterans covering inventions patented prior to November 11, 1918, and who had suffered a loss of income therefrom because of military service. This bill passed the House and Senate, was signed by the President, but not by the Vice President (at that time, the signature of the Vice President was necessary for the bill to be enacted).

2. PUBLIC LAW 623 (70TH CONG.), MAY 31, 1928

a. H.R. 10435, February 2, 1928 (Mr. Vestal)

H.R. 10435 permitted the extension of a patent issued to a veteran prior to November 11, 1918, and who suffered a loss of income because of his term in service.

The bill read, in part, as follows:

> *Be it enacted* * * * That any person who served honorably in the military or naval forces of the United States at any time between April 6, 1917, and November 11, 1918, both dates inclusive, and was subsequently honorably discharged, may within six months after the enactment of this act, upon payment of a fee of $20, make application to the Commissioner of Patents, comprising a verified statement, accompanied by supporting evidence of the following facts:
>
> (A) That he is the inventor * * * of an invention * * * for which a patent was granted prior to November 11, 1918,

(*h*) Bearing a direct relation to or made in consequence of the official duties of the inventor means that the duties to which the inventor had been assigned were such that the invention could reasonably be expected to arise therefrom.

7. *When assignment is required.*—When any of the conditions set forth in paragraph 5, as defined in paragraph 6, are present, the domestic rights and, in the discretion of NACA headquarters, foreign rights in and to the invention shall belong to the Government if—

(*a*) The conditions are equitably sufficient to justify assignment thereof by the employee to the Government; and

(*b*) The Government has sufficient interest in the invention to require assignment thereof by the employee.

If it should be found that assignment is not required under (*a*) and (*b*) of this paragraph, the employee nevertheless shall be required to grant to the Government a nonexclusive, irrevocable, royalty-free license in the invention and under any patents which may issue thereon, with power to grant licenses for all governmental purposes. When none of the conditions set forth in paragraph 5, as defined in paragraph 6, are present, the entire right, title, and interest in and to the invention shall be left in the employee, subject to law.

8. *When conditions are presumed.*—It is presumed that the conditions of paragraph 5, as defined in paragraph 6, are present, when the employee is employed or assigned—

(*a*) To invent or improve or perfect any art, machine, manufacture, design, or composition of matter;

(*b*) To conduct or perform research or development work, or both;

(*c*) To supervise, direct, coordinate, or review Government financed or conducted research work, or both; or

(*d*) To act in a liaison capacity among governmental or nongovernmental agencies or individuals engaged in such research or development work, or both.

9. *Burden of proof.*—Employees within the classes defined in paragraph 8 may submit evidence that will enable NACA headquarters to establish the absence of any one or more of the conditions of paragraph 5, as defined in paragraph 6, or that the conditions which are present are insufficient equitably to justify a requirement that assignment be made to the Government of the invention and any patent which may issue thereon. For employees not within the classes defined in paragraph 8, the Government must establish that the conditions of paragraph 5, as defined in paragraph 6, if present, are sufficient equitably to require an assignment to the Government of the invention and to any patent which may issue thereon.

10. *Foreign rights.*—An assignment of the foreign rights in and to the invention shall be made by the employee, upon request, whenever an assignment of the domestic rights is required. Where, however, an assignment of the domestic rights is not required, an assignment of the foreign rights in and to the invention may be made by the employee, upon request.

APPEALS AND PETITIONS

11. *Appeals.*—Any employee of the National Advisory Committee for Aeronautics who is aggrieved by a determination by NACA head-

APPENDIXES

APPENDIX A

Rules and Regulations Relating to Patentable Inventions of Employees of the National Advisory Committee For Aeronautics

Attachments:

(1) Administrative Order No. 5 of the Government Patents Board approved April 26, 1951 (16 F.R. 3927).

(2) Form NAVEXOS–2374 (Rev. 4–51), Record of Invention and Instructions for Preparation thereof.

(3) Form NAVEXOS–2375 (Rev. 1–47), Disclosure of Invention.

1. *Executive Order 10096.*—By Executive Order 10096 dated January 23, 1950 (15 F.R. 389), the President established a basic Government patent policy with respect to the inventions made by employees of the Federal Government under which the Government may, under certain conditions, acquire title to inventions made by its employees under other conditions. Determination by a Government agency that the Government has or is to take less than full title to an invention is subject to approval by the Chairman of the Government Patents Board established under this order.

2. With a view to obtaining uniform application of the policy set out in this order and uniform organization thereunder, the Chairman of the Government Patents Board is authorized and directed, after consultation with the Board, to formulate and submit to the President for approval such proposed rules and regulations as may be necessary or desirable to implement and effectuate the policies established. Each Government agency is also required to take all steps appropriate to effectuate the order, including the promulgation of necessary regulations which shall not be inconsistent with those approved by the President.

3. *Government Patents Board implementing rules and regulations.*—On April 26, 1951, the President approved certain rules and regulations under Executive Order 10096 which have been issued as Administrative Order No. 5 of the Government Patents Board (16 F.R. 3927), attachment (1). These rules and regulations in section 6 thereof, restate the basic Government patent policy established by the President; and in this section and certain others set forth the responsibilities of Government agencies. The agency responsibilities, among others, include determination of invention, determination of rights in inventions, determination of whether patent protection will be sought in the United States, and the furnishing of certain reports.

4. *NACA responsibilities.*—In carrying out these agency responsibilities for the National Advisory Committee for Aeronautics, NACA

> I think it is bad practice. In my opinion it is the beginning, possibly, of the wedge of the Federal Government getting into private business and of the Federal Government chartering corporations in the United States. Otherwise, it is a harmless little matter. Probably it will not do any harm or any good.

Mr. Javits' amendment was agreed to. The Senate passed H.R. 7963, as amended, the same day (July 1, 1958).

e. House Conference Report No. 2135

The conference report on H.R. 7963 was submitted on July 9, 1958. Amendment No. 31 was concerned with the provision relating to research and development, and was explained in conference as follows:

> This amendment added to the House bill a new section (sec. 9) establishing a program of assistance to small-business concerns in the field of research and development. Under this program SBA would assist small-business concerns in obtaining Government contracts for research and development and in obtaining the benefits of research and development performed by larger firms under Government contracts or at Government expense. Groups of small-business concerns would also be encouraged to join together for research and development work, with technical and other assistance being provided by SBA, and would be authorized to undertake such joint research and development programs without violating the antitrust laws or the Federal Trade Commission Act. The House recedes.

Both Houses approved the conference report, and the bill became Public Law 536 on July 18, 1958.

3. PUBLIC LAW 536 (85TH CONG.), JULY 18, 1958

Public Law 536 amended the Small Business Act of 1953, making various changes in the interest of promoting a more vigorous and efficient program of assistance to small business. The principal changes were (1) to make the Small Business Administration a permanent agency, (2) to increase the authorization for loans to small business to $350,000 maximum outstanding at any one time to a single firm, (3) to provide for a more equitable share of Government procurement for small business by requiring a new definition of small business for procurement purposes, (4) to reduce the interest rate on direct SBA business loans and on SBA's share of such loans made in participation with private lenders and to eliminate the ceiling on the interest rate on the private lender's share, and (5) to provide the section 9 provisions heretofore discussed, relating to research and development.

Section 9, as finally accepted, provided:

> SEC. 9. (a) Research and development are major factors in the growth and progress of industry and the national economy. The expense of carrying on research and development programs is beyond the means of many small-business concerns, and such concerns are handicapped in

serving the aircraft industry, as we have since 1916, we have been all too well aware of the exceedingly difficult situation which is imposed on small business, and possibly others, relative to inability to obtain basic information under the guise of security restrictions.

I cite as an example the situation with which I am best aware; namely, the difficulties this organization encounters in obtaining classified reports which would be of great benefit in the pursuit of our endeavors. The Armed Services Technical Information Agency, better known throughout the trade as ASTIA, operates under procedures prohibiting the distribution of classified reports to organizations who do not possess that very elusive requirement known as need to know. Normally need to know can be established by possession of a classified contract. However, it is difficult to obtain a classified contract without certain basic information which is maintained under close security surveillance. This obviously is akin to the well-known dog chasing his tail.

We have been a cleared facility security-wise for a number of years. However, we have not had a development contract for the past several years and during that period have been unable to obtain the basic information which we feel would assist us in obtaining such contracts in the future.

I take the liberty of directing your attention to the above situation as being one which I believe is typical of the thoughtless discriminatory action against the smaller fellows. I do hope the passage of your bill will permit this situation to be corrected.

The Committee on Banking and Currency amended H.R. 7963 by adding a new section 9. Subsection (a) of the new section 9 contained an introductory provision reciting the importance of research in today's economy, the difficulties posed for small business in this area, and a declaration of congressional policy to aid small business in these respects in order to strengthen and protect our competitive free enterprise system. Subsection (b) empowered the Administration to aid small business to obtain Government research and development contracts and the benefits of Government-financed research and development. Subsection (c) authorized it to cooperate with other Government agencies in achieving these purposes. Subsection (d) authorized it to work out with small business concerns joint research and development programs, approve agreements providing for such programs (after consultation with the Attorney General and Federal Trade Commission) where he finds they will "maintain and strengthen the free enterprise system and the economy of the Nation," and provided that acts pursuant to such agreements should not be deemed in violation of the antitrust laws or the Federal Trade Commission Act.

d. Action taken, Senate—H.R. 7963

H.R. 7963 was debated in the Senate on July 1, 1958. Mr. Javits sponsored an amendment which would make even more specific the exact activities in which small business might engage in the field of research and development. It (1) empowered the Small Business Administration to give small-business concerns technical assistance in

istrator or the Attorney General may at any time withdraw his approval of the agreement and the joint program of research and development covered thereby, if he finds that the agreement or the joint program carried on under it is no longer in the best interests of the competitive free enterprise system and the economy of the Nation. A copy of the statement of any such finding and approval intended to be within the coverage of this subsection, and a copy of any modification or withdrawal of approval, shall be published in the Federal Register. The authority conferred by this subsection on the Administrator shall not be delegated by him.

(3) No act or omission to act pursuant to and within the scope of any joint program for research and development, under an agreement approved by the Administrator under this subsection, shall be construed to be within the prohibitions of the antitrust laws or the Federal Trade Commission Act. Upon publication in the Federal Register of the notice of withdrawal of his approval of the agreement granted under this subsection, either by the Administrator or by the Attorney General, the provisions of this subsection shall not apply to any subsequent act or omission to act by reason of such agreement or approval.

Act of April 1, 1869 (16 Stat. 604, ch. 8).

Extension for 7 years of patent of James M. Miller for improvement in surface condensers for steam engines authorized, on application of Isabella C. Youngs.

Act of February 9, 1870 (16 Stat. 613, ch. 15).

Extension (apparently for 7 years) of Alinzor Clark's patent for fastening for hay and manure forks authorized.

Act of March 15, 1870 (16 Stat. 631, ch. 27).

Extension (apparently for 7 years) of Walter Hunt's patent for manufacture of paper collars authorized.

Act of March 25, 1870 (16 Stat. 631, ch. 37).

Extension (apparently for 7 years) of Thomas Thompson's patent for improved machine for folding paper authorized.

Act of March 25, 1870 (16 Stat. 631, ch. 38).

Extension (apparently for 7 years) of William Mont Storm's patent for improvement in revolving firearms authorized.

Act of April 6, 1870 (16 Stat. 633, ch. 50).

Extension (apparently for 7 years) of Tobias J. Kindleberger's patent for improvement in cider mills authorized.

Act of May 4, 1870 (16 Stat. 636, ch. 78).

Extension (apparently for 7 years) of Augustus R. Moen's patent for improvement of basement, etc., walls, to render them impervious to water, authorized.

Act of July 7, 1870 (16 Stat. 648, ch. 215).

Extension (apparently for 7 years) of John Tyler's patent for improvements in waterwheels authorized.

Act of July 7, 1870 (16 Stat. 648, ch. 216).

Alexander C. Twining's patent for improvement in process and apparatus for making ice to be extended for 7 years.

Act of July 14, 1870 (16 Stat. 656, ch. 291).

John Bachelder's patent for improvement in sewing mechanism extended for 7 years.

Act of July 15, 1870 (16 Stat. 657, ch. 308).

Extension (apparently for 7 years) of patent of Francis M. Strong and Thomas Ross for improvement in platform scales authorized.

Act of January 25, 1871 (16 Stat. 399, ch. 28).

Extension for 7 years of Pierpont Seymour's patent for improvement in seed planters or grain drills authorized.

Act of January 30, 1871 (16 Stat. 401, ch. 30).

Extension (apparently for 7 years) of Joseph Rodefer's patent for improvement in bedstead fastenings authorized.

Act of January 31, 1871 (16 Stat. 401, ch. 31).

Extension (apparently for 7 years) of Arnton Smith's patent for improvement in plows authorized.

Act of May 15, 1874 (18 Stat. 550, ch. 179).

Effect given to extension (apparently for 7 years) of McClintock Young's patent for improvement in harvesting machines.

Act of February 18, 1875 (18 Stat. 630, ch. 85).

Extension for 7 years of Joshua Hathaway's patent for improved device for converting reciprocating into rotary motion authorized.

such invention shall be the exclusive property of the United States, and if such invention is patentable a patent therefor shall be issued to the United States upon application made by the Administrator, unless the Administrator waives all or any part of the rights of the United States to such invention in conformity with the provisions of subsection (f) of this section.

(b) Each contract entered into by the Administrator with any party for the performance of any work shall contain effective provisions under which such party shall furnish promptly to the Administrator a written report containing full and complete technical information concerning any invention, discovery, improvement, or innovation which may be made in the performance of any such work.

(c) No patent may be issued to any applicant other than the Administrator for any invention which appears to the Commissioner of Patents to have significant utility in the conduct of aeronautical and space activities unless the applicant files with the Commissioner, with the application or within thirty days after request therefor by the Commissioner, a written statement executed under oath setting forth the full facts concerning the circumstances under which such invention was made and stating the relationship (if any) of such invention to the performance of any work under any contract of the Administration. Copies of each such statement and the application to which it relates shall be transmitted forthwith by the Commissioner to the Administrator.

(d) Upon any application as to which any such statement has been transmitted to the Administrator, the Commissioner may, if the invention is patentable, issue a patent to the applicant unless the Administrator, within ninety days after receipt of such application and statement, requests that such patent be issued to him on behalf of the United States. If, within such time, the Administrator files such a request with the Commissioner, the Commissioner shall transmit notice thereof to the applicant, and shall issue such patent to the Administrator unless the applicant within thirty days after receipt of such notice requests a hearing before a Board of Patent Interferences on the question whether the Administrator is entitled under this section to receive such patent. The Board may hear and determine, in accordance with rules and procedures established for interference cases, the question so presented, and its determination shall be subject to appeal by the applicant or by the Administrator to the Court of Customs and Patent Appeals in accordance with procedures governing appeals from decisions of the Board of Patent Interferences in other proceedings.

(e) Whenever any patent has been issued to any applicant in conformity with subsection (d), and the Administrator thereafter has reason to believe that the statement filed by the applicant in connection therewith contained any false representation of any material fact, the Administrator within five years after the date of issuance of such patent may file with the Commissioner a request for the transfer to the Administrator of title to such patent on the records of the Commissioner. Notice of any such request shall be transmitted by the Commissioner to the owner of record of such patent, and title to such patent shall be so transferred to the Administrator unless within thirty days after receipt of such notice such owner of record requests a hearing before a Board of Patent Interferences on the question

> States Weather Bureau; one representative of the National Bureau of Standards; one Department of Defense representative who is acquainted with the needs of aeronautical research and development; and not more than seven other members selected from persons acquainted with the needs of aeronautical science, either civil or military, or skilled in aeronautical engineering or its allied sciences.

The term of membership for persons other than those representing Government agencies is 5 years.

Throughout the years the organization of the National Advisory Committee for Aeronautics grew, and at the time of its absorption into the National Aeronautics and Space Administration, the members appointed by the President were aided by four major committees: the Committee on Aircraft, Missile, and Spacecraft Aerodynamics, the Committee on Aircraft, Missile, and Spacecraft Propulsion, the Committee on Aircraft, Missile, and Spacecraft Construction, and the Committee on Aircraft Operating Problems. The membership of these committees resembled that of the central committee, in that they were composed of a cross section of persons from Government and from private research. Each committee had subcommittees, and here too the wide range of membership permitted coordination of NACA research with that of other agencies. In addition to these four technical committees, the NACA established an Industry Consulting Committee in 1945 and a Special Committee on Space Technology in January 1958.[96]

A small portion of the NACA's work was done under contract with research and educational institutions, but most of it was done on the NACA grounds and was governed by the needs of national defense. The NACA preserved a close working arrangement with many Government agencies, especially the armed services, in order to avoid duplication of research and to permit maximum use of its findings.[97] For example, the NACA had some of its personnel working at the Atomic Energy Commission laboratories.[98]

The duties of the National Advisory Committee for Aeronautics were likewise enlarged. Under the act of May 25, 1948, it was authorized—

> to direct and conduct research and experiment in aeronautics in the Langley Aeronautical Laboratory, the Ames Aeronautical Laboratory, the (Lewis)[99] Flight Propulsion Laboratory and in such other laboratory or laboratories as may, in whole or in part, be placed under the direction of the Committee.

2. PATENT POLICY

In carrying out its duties, both on its own and under contracts with other institutions, the NACA had to face the problem of rights in inventions resulting from its research. It was subject to the pro-

[96] U.S. National Advisory Committee for Aeronautics, Forty-Fourth Annual Report, 1958, pp. 83–93.
[97] Senate Committee on Armed Services. Report by Ralph E. Flanders on visit to the facilities of the National Advisory Committee for Aeronautics, pp. 1–3 (Apr. 8–13, 1955); U.S. President's Scientific Research Board, science and public policy, a report to the President by John R. Steelman, vol. 2, The Federal research program, pp. 256–261 (1947).
[98] Hearings on H.R. 2581 (H.R. 3761), before the Subcommittee on Real Estate and Military Construction of the Senate Committee on Armed Forces, 84th Cong., 1st sess., pp. 10, 18 (1955).
[99] The word "Lewis" was inserted by the act of Aug. 8, 1950.

> That the National Research Council hereby declares its intention to dedicate to the use of the public, in such manner as the Research Council may deem most effective, the results of such discoveries as are made in the course of investigations conducted under the auspices of the Research Council.[83]

The patent policy adopted in 1924 is still in effect. Several patents have been assigned to the National Research Council under this policy.[84]

5. ACTIVITIES OF THE ACADEMY-RESEARCH COUNCIL

The activities of the Academy-Research Council are many and varied. It awards scientific fellowships and helps in the administration of the fellowships of the National Science Foundation. It undertakes research projects at the request of Government agencies and has served in an advisory capacity to other organizations. Its committees are engaged in many types of research, the results of which are often published. The Academy-Research Council also publishes the Proceedings of the National Academy of Sciences and the News Report; these, in addition to its lecture series, help promote its relations with the general public.[85]

The operations of the Academy-Research Council are even better shown by its achievements, a few of which will be mentioned here. From 1922 to 1930, the Research Council worked on the preparation of the International Critical Tables of Numerical Data of Physics, Chemistry and Technology. It assisted in the plans for a scientific exposition at the Chicago World's Fair in 1933, and the Division of Medical Sciences studied the problem of deafness, following a 1924–25 survey of schools for the deaf by the Division of Educational Relations. The Division of Engineering and Industrial Research has carried out many special projects, including an investigation in the 1920's of damage to the dikes in San Francisco Bay and work in highway research. In addition, this division has sponsored laboratory tours for industrial representatives and has carried out surveys of industrial research.[86]

During the early years of World War II, the Academy-Research Council made a survey of research facilities available for war use. At the request of the Government many projects were carried out during the war, including those on "military medicine involving extensive cooperation with the Committee on Medical Research, food and nutrition, research on critical metals and other materials, and certain problems of actual warfare, many of them highly confidential." [87]

The activities of the Academy-Research Council have continued to expand following the war. A National Committee of the International Union Against Cancer was organized, as well as a Committee on Disaster Studies, which made an investigation in Europe at the time of the 1953 floods. A special Academy committee studied the National Bureau of Standards' findings on battery additive AD–X2,

[83] U.S. Department of Justice, Investigation of Government Patent Practices and Policies: Report and Recommendations of the Attorney General to the President, vol. II, p. 223 (1947).
[84] National Research Council.
[85] Report of the National Academy of Sciences, National Research Council, fiscal year 1953–54.
[86] Consolidated report upon the activities of the National Research Council 1919–32, pp. 24–29, 72–75, 115–126.
[87] Zwemer, note 80, supra, at p. 237.

Section 1(a)(2)—patents affected by Government stop orders: There is no accurate way of estimating the number of applications which would be submitted under this category. Under British patent extension law, which is more liberal, 3⅛ percent of the patents which were eligible for extension applied for such extensions. Using the British 3⅛ percent as a basis, and applying it to the 400,000 U.S. patents which are presently eligible for extension merely from the standpoint of the dates involved, the U.S. Patent Office estimates that there could be about 13,000 applications in this class. This is a top estimate.

Section 1(a)(3)—licenses granted Government on royalty-free or nominal royalty basis: 600 specific patents were given to the Government under this category which have not expired. In addition, 52 companies granted licenses to Government on all of the patents which they owned. No estimate of number of patents involved could be given. Also, the entire radio industry (125 companies) granted licenses to Government in certain designated categories of patents. No accurate estimate could be made on this group. The Patent Office representative estimated that applications under this subsection would not be great—would not go into the thousands.

It should be remembered that any period of extension granted under this legislation would not speak from the date of this act or the date from which any extension is granted by the Patent Office; but rather from the date of expiration of the original term of the patent (sec. 1(b) of this bill). This circumstance alone will virtually preclude any patent the original term of which expired prior to January 1, 1952. The greatest extent of curtailment a patent owner may suffer under this bill, exclusive of a patent owned by a veteran, is about 4 years. Most patents, of course, will be affected for shorter times, since Government stop orders were issued progressively from 1942 as the exigencies of the national emergency increased. An extension of the 4-year term added to a patent which expired January 1, 1952, would bring the patent owner up to January 1, 1956, and would yield him very little or nothing. It follows therefore, that, for practical beneficial purposes, only patents which expire well after January 1, 1952, are worth filing an extension for and then only where the 4-year period of curtailment can be shown.

A minority report of the Committee expressed the following views:

REASONS FOR REJECTING THIS PROPOSAL

1. It singles out patent owners as a preferred class for relief from losses due to wartime controls, which is unfair to others who suffered equally from the same cause, such as filling stations which could not get gasoline and steak houses which could not get steak.

2. It opens up for extension thousands of patents, throws a heavy burden on the Patent Office, and sets up such a vague standard that it leaves too wide an administrative discretion.

The offices also develop additional small-business sources for research and development projects when notified by the agency's representatives at procurement centers that greater small business competition is needed.

The percentage of research and development contracts awarded to small business firms possibly could be increased by use of the joint set-aside program. Accordingly, the agency has instructed its representative at procurement centers to initiate joint set-asides on research and development projects when two or more small business firms have qualified as prospective contractors. This action will give Government procurement officials every opportunity to cooperate in increasing the share of research and development contracts being awarded to small business concerns. To illustrate effective use of the joint set-aside program in this area, of all research and development procurements screened at the Quartermaster Research and Engineering Command at Natick, Mass., during the 6-month period ending December 1957, almost 50 percent of the dollar value was set aside for small business.

Senator Fulbright had received letters from a number of organizations, telling of the importance of increasing the share of military business awarded to small research and development organizations. Some of these included:

(3) *Robert C. Ruhl*, business manager, Miller Research Laboratories, Baltimore, Md., who had the following to report on weapons contracts:

As weapons have become larger and more complex, it is well known that the weapons business has become a highly concentrated one, with considerable resulting loss of business not only to small companies but medium to large as well.

Speaking for small business, the things which we offer in the research and development field are quick delivery, expertness, low cost, and the flexibility to produce under conditions of change and revision. In a freely competitive situation, the small research and development organization needs no prop or protection.

There are many small weapons and subassemblies of large weapons which small business can most efficiently design and produce. I believe that the most important single factor preventing wider use of small and medium companies is the weapons-system concept.

The weapon-system concept is most widely applied by the Air Force, almost as widely by the Navy and to a considerably lesser extent by the Army.

The weapon-system concept is dictated to a considerable extent by technological necessity. That is, up to a point, large weapons require large contractors. Much equipment, however, is included in the weapon system as a matter of military policy and not of technological necessity.

It has been jokingly said that the weapon-system concept has been carried to the point where the military services would like the missile prime contractor to furnish clothing

patents, subject, in the case of research for the Department of Defense, only to a license to the Government, leaving commercial exploitation up to the concern. Under these conditions small business concerns must necessarily fall rapidly behind in the competitive race for new products and new processes.

In my judgment, three things can be done which will help to keep small business in the race and will thereby strengthen the free competitive enterprise system and the national economy.

In the first place, every effort should be made to see that small business concerns have a chance to obtain Government research and development contracts. I realize that this cannot be done in every case. In some instances only the large concern can do the research or may be interested in doing the research. Nevertheless, I believe that a vigorous effort should be made to award as many research and development contracts to small businesses as possible. This will be of direct benefit to the small-business concerns and to the economy as a whole.

In the second place, every effort should be made to make available to small business concerns the benefits and results of all of the research and development work done by the Government or at Government expense. If the Government pays for research and pays a price which will yield the concern doing the research a profit, it would seem difficult to justify adding to that profit the right to all the commercial benefits of an invention derived from that research, paid for by the taxpayers, including small business concerns.

In the third place, I believe that arrangements should be made to enable small business concerns to get together to carry on research and development programs, with an exemption from the antitrust laws and the Federal Trade Commission Act. Research and development projects are often extremely expensive and the results do not always pay off at once in measurable profits. A single small business concern may not have the financial resources to carry on over a period the kind of research and development work which would give it an equal opportunity to compete in a new fast-developing market with its giant competitor. However, a group of small business concerns might each be able to devote a fraction of the cost of the research and development contracts and produce something which would benefit not only the small business concerns involved but also the consuming public and the national economy.

This would not be inconsistent with the basic purposes of the antitrust laws and Federal Trade Commission Act. Rather, by increasing the opportunity of small business concerns, it would promote and strengthen the free competitive enterprise system and the national economy as well.

In order to carry out these objectives, I have prepared a bill which will give to the Small Business Administration the duty and authority to pursue these three objectives in the interest of small businesses. Other Government agencies

priated to the Department of Defense which have been expended, obligated, or contracted to be spent with small-business concerns and the amount of such funds expended, obligated, or contracted to be spent with firms other than small business in the same fields of operation; and such monthly reports shall show separately the funds expended, obligated, or contracted to be spent for basic and applied scientific research and development.

c. H.R. 7474, May 13, 1957 (Mr. Multer)

H.R. 7474 provided that the Small Business Administration shall be a permanent agency, clarified the definition of "small business," contained extensive and detailed provisions for loans to and financing of small business, etc. Section 107(k) provided that it shall be the duty of the Administration * * *

to make studies and recommendations to the appropriate Federal agencies to insure that a fair proportion of the total purchases and contracts for supplies and services for the Government be placed with small-business enterprises, to insure that a fair proportion of Government contracts for research and development be placed with small-business concerns, and to insure a fair and equitable share of materials, supplies, and equipment to small-business concerns.

d. Senate Resolution 138, May 20, 1957 (Mr. Sparkman and others)

Senate Resolution 138 provided that it is the sense of the Senate that the present percentage of small business contract awards by the Department of Defense is inadequate and there should be established a reasonable percentage standard for the more precise guidance of Government purchasing agencies.

e. H.R. 7963, June 6, 1957 (Mr. Spence, reporting from committee)

This bill would rewrite the Small Business Act, making various changes in the interest of promoting a more vigorous and efficient program of assistance to small business. The principal changes are (1) to make the Small Business Administration a permanent agency, (2) to improve the facilities for loans to small business through larger authorizations, lower interest rates, etc., and (3) to provide for a more equitable share of Government procurement for small business by requiring a new definition of small business for procurement purposes.

Section 9 provided for the encouragement of research and development in small business by the awarding of Government contracts. As reported from the House committee, this section was identical to section 209(d) of H.R. 6645, supra p. —.

f. S. 2993, January 13, 1958 (Mr. Fulbright)

This bill would direct the Small Business Administration to assist small business concerns in obtaining Government contracts for research and development and in benefiting from research resulting from Government support. It would permit the Administrator, with the

agencies in the Defense Establishment, I believe it would be very desirable for Congress to require the Defense Department to justify why it has as many agencies as it does.

One of the great difficulties in running the Defense Establishment is that it is so large. So I definitely would put the new agency under civilian control.

Now that is from an organization standpoint. From a scientific standpoint, I also believe that space is more a civilian than a military matter.

There is today a complete blurring of identity between military and civilian matters. War is now not a matter for the military alone. I am sure you are fully aware that the military is merely the cutting edge of the sword, that all of us, our farms, our factories, our schools, our Government—all of our institutions contribute to the military strength of the country.

* * * * *

Furthermore, if we are ever to have peace in this tortured world of ours, we must make a beginning—we must get away from the purely military applications of space. We must recognize that the marriage of the military and science is proceeding too fully and too strongly; we must attempt to stop this tendency and instead emphasize the peaceful applications of science.

Admiral Rickover submitted the following letter expressing his ideas on patent rights:

U.S. ATOMIC ENERGY COMMISSION,
Washington, D.C., May 7, 1958.

Hon. JOHN W. MCCORMACK,
Chairman, Select Committee on Astronautics and Space Exploration, House of Representatives.

DEAR MR. MCCORMACK: At the time of my testimony on April 18, 1958, before your committee you asked that I submit comments for the record on patent provisions for outer space legislation.

Of course I lack the expertness to recommend specific legislative language, but I would like to make some general observations. I believe that one can distinguish clearly between patent rights arising from discoveries made with the expenditure of public money and those which are developed privately. In the case of inventions conceived during the course of a Government contract or similar relationship, strong provision should be made for the patent rights to be vested in the Government. A provision such as this does not freeze patents because the Government has continuously licensed others to use patents in the interest of the country as a whole.

Whenever a private party conceives of an invention or discovery and no Federal funds are involved in the work, he has a rather sacred constitutional right to the exclusive use of his invention or discovery. I do not think that writing a provision in outer space legislation which would

(7) *Edward U. Condon,* Director, National Bureau of Standards (pp. 76–82), believed that there is need for governmental activity in this field and that this bill provides an adequate instrumentality for this purpose.

(8) *Senator Alexander Wiley* commented that he was concerned that the bill might curb initiative.

(9) *John C. Green,* chief engineer, National Inventors Council (pp. 86–94), said:

> The objectives of the Fulbright bill, as I interpret them, are essentially to expedite the transformation of creative ideas into marketable items which will in turn create additional productive job opportunities. I believe that these objectives are logical and sensible and the bill contains appropriate provisions to carry them into practical effect.

The average inventor, he declared, brings his ideas to larger companies since he has no way of knowing if some smaller company would want the product. He said that the bill would help inventors to learn the procedures for commercializing their inventions and enable them to obtain needed advice before going to the Patent Office.

Senator Wiley suggested that the requests would run into the millions and posed the problem of getting a staff to handle them. He indicated his belief that the patent attorneys were performing an adequate job in this respect. Mr. Green replied that they (the National Inventors Council) handled as many as 2,000 requests a day during the war with no trouble. He emphasized that someone should give the inventor a helping hand, that too many people think of the inventor as a "crackpot." On the other hand, inventors with unproductive ideas would be saved unnecessary expenditures. On this last issue Senator Wiley made the following point:

> If a fellow has an unproductive idea, is it the business of the Government to give him that information or is it his business to find out? Should he not pay some lawyer to find out whether it is unproductive, or should the Government butter his bread and not butter mine?

(10) *D. F. Cleary,* acting assistant administrator, Retraining and Reemployment Administration, Department of Labor (pp. 94–98), expressed the viewpoint of the veteran. Veterans had acquired mechanical inventiveness during the war, and this bill would help continue it.

(11) *Raymond M. Wilmotte,* Wilmotte Laboratories (pp. 82–86, 98), believed the bill would be of considerable benefit to general technical progress as well as to small business.

(12) *C. E. Earle,* director of the Earle Research Laboratory (pp. 99–101), told of the necessity of the bill for small industries, and of the importance of small industries from the dispersal standpoint in case of nuclear attack.

(13) *Clark L. Fry,* designing engineer (pp. 105–107), was in favor of the bill. He said that a survey of inventors showed that the main problem was lack of communication and understanding between inventor and patent attorney. Many worthwhile inventions have not gotten on the market as a result.

> and geological and mineralogical specimens, belonging, or hereafter to belong, to the United States, which may be in the city of Washington, in whosesoever custody the same may be, shall be delivered to such persons as may be authorized by the board of regents to receive them, and shall be arranged in such order, and so classed, as best (to) facilitate the examination and study of them * * *.

The Institution was to acquire new material through gifts and through "exchange of duplicate specimens."

The secretary of the board of regents would serve as "librarian" and "keeper of the museum" (sec. 7). Section 8 provided for meetings of the members and honorary members. It also stated:

> And the said regents shall make, from the interest of said fund, an appropriation, not exceeding an average of $25,000 annually for the gradual formation of a library composed of valuable works pertaining to all departments of human knowledge.

Section 10 read:

> And be it further enacted, that the author or proprietor of any book, map, chart, musical composition, print, cut, or engraving, for which a copyright shall be secured under the existing acts of Congress, or those which shall hereafter be enacted respecting copyrights, shall, within 3 months from the publication * * * deliver, or cause to be delivered, one copy of the same to the librarian of the Smithsonian Institution, and one copy to the librarian of Congress Library, for the use of said libraries.

D. DEVELOPMENT OF THE SMITHSONIAN INSTITUTION

1. CHANGES IN STRUCTURE

The act of August 10, 1846, formed the basis for the establishment of the Smithsonian Institution, but subsequent legislation greatly enlarged the Institution's functions, although leaving its structure largely unchanged. The only significant changes in structure lay in provisions for the appointment of regents. The provisions of section 3 of the act of August 10, 1846, were changed by the act of January 10, 1865, which repealed the requirement that two of the regents be members of the National Institute, and by the act of March 20, 1871, which substituted the Governor of the District of Columbia for the Mayor of Washington as a regent. The act of March 12, 1894, further changed the membership of the Board of Regents so that it now consists of the Vice President, the Chief Justice, three Senators, three Representatives, and six other persons, two of whom are from Washington and the others from different States.

2. GROWTH

Throughout the years the collections and the facilities of the Smithsonian Institution have grown, and new buildings have been constructed. As of June 30, 1958, the Smithsonian Institution had ten branches: the Astrophysical Observatory, the Bureau of American

penalize rather than be an incentive to the small, enterprising businessman.

(12) *Raymond M. Wilmotte*, Raymond M. Wilmotte, Inc. (pp. 199–200), was in favor of the legislation, but suggested that a clause should be inserted stating:

> No project shall be financed under this Act to be carried out by governmental or nonprofit organizations unless no commercial facilities are available.

(13) *P. J. Federico*, examiner in chief, U.S. Patent Office, reading a statement of *Casper W. Ooms*, Commissioner of Patents (pp. 222–230), felt that the main advantages of the bill were that small businessmen would have a place to turn for technical advice and aid, and inventors could use this as a place to offer their inventions for use to private industry. He especially approved of establishing a central agency where technical information could be gathered and classified. He also thought that much unnecessary or misguided effort on the part of the inventor, could be avoided by his obtaining an appraisal of his invention.

(14) In written testimony, the *National Small Business Men's Association* (pp. 230–231) opposed the bill because:

> 1. Existing laws protect discoveries of engineers, inventors, scientists, and technicians.
>
> 2. The dissemination of technological and scientific information concerning such discoveries is presently possible through existing agencies.
>
> 3. Such discoveries as are in the interests of American industry and business can be presently ascertained and used by American industry and business through direct arrangements with the discoverers where such discoverers desire such use.
>
> 4. Where the discoverers do not desire such use the Government should not violate this right of private property in the individual citizen.

(15) *Miscellaneous Government agencies.* Letters were submitted from the Departments of War, Navy, Agriculture, Commerce, and the Administrator of the National Housing Agency. None of these objected to the bill, but several improvements in certain details were suggested.

c. Report and amendments

The Senate Committee on Expenditures in the Executive Departments reported favorably on S. 493, with an amendment, on June 27, 1947 (S. Rept. 395).

The amended bill kept the provision to make existing technical, engineering, and scientific information and processes more readily available to American business and industry through a clearinghouse in the Department of Commerce. It eliminated all provisions for advice and assistance to inventors on the possible merit of their ideas and in the development or marketing of inventions or patents.

In justifying its amendment, the committee said:

> The original bill provided three main fields of activity: (1) The establishment within the Department of Commerce of a

commitment has been made; (3) shall contain such further provisions as may be necessary to conform to laws of the United States relating to Government patents or to Government research and development; and (4) may be entered into without regard to sections 3709 and 3648 of the Revised Statutes and the civil service and classification laws.

The Secretary might make a record of each invention, make an analysis of its possibilities, and render a written report thereon. The report was to be limited to transmitting information to assist the person to arrive at his own independent informed judgment as to whether the commercial potentialities of his invention would warrant further development.

b. Hearings and significant testimony

Hearings were held before the Senate Committee on Expenditures in the Executive Departments on May 19, 20, 21, 22, 23, and 28, 1947. Witnesses included the following:

(1) *Vannevar Bush* (pp. 200–222) said that although it was desirable to improve the means of tapping inventive resources, S. 493 was not sufficiently definite to guide the person who would administer it or the persons who would wish to avail themselves of its benefits. The Government should avoid large expenditure of funds without adequate return to the Nation. He said that a critical study should be made of existing Government agencies, the National Inventors Council and the Canadian National Research Council to see whether this legislation was necessary.

He added:

> I must reluctantly conclude that this bill will not result in values to the country as a whole commensurate with the costs involved.

He believed that services to be performed in the bill are being performed every day—

> by trade journals, technical publications, individual and group promoters, consulting engineers, economists, and experts of various kinds, by patent attorneys, and commercial and academic research laboratories.

Dr. Bush said that he preferred relying on the initiative of citizens; that the costs should be charged to users of the services and not to the entire group of taxpayers; and that the size of the undertaking might be enormous. He also questioned whether small and new businesses would really be the gainers.

He described the pressures of tax structure and suggested revising the method of evaluating small enterprises, so they would not be forced to sell their interests to large companies. He pointed out other restrictions, and suggested liberalizing Securities and Exchange Commission regulations.

(2) *John C. Green*, director, Office of Technical Service (pp. 21–26, 155–174), described a study made with Canadian officials of the Canadian National Research Council. He said that although the present bill was designed with small businesses in mind, it would have the effect of aiding all business. It could be carried on under the present

17. *Rights in the employee.*—Where, however, NACA headquarters has determined to leave the domestic rights in and to the invention with an employee subject to a license in favor of the Government and the employee acquiesces in this determination, NACA headquarters will, upon the filing of an application for patent and pending review of the determination by the Chairman of the Government Patents Board, take such license rights as are specified in subparagraph 9(b)(2) of attachment (1), should the Chairman of the Board so decide.

REPORTING OF INVENTIONS

18. *Employee defined.*—The term "employee" as used herein means any officer or employee of the National Advisory Committee for Aeronautics, including any part-time consultant or part-time employee, except when special circumstances in a specific case require a departure herefrom to meet the needs of the National Advisory Committee for Aeronautics. Such circumstances shall be reported to the Chairman of the Government Patents Board and separately promulgated if approved by him.

19. *Responsibility of employee.*—

(*a*) Whenever an employee of the National Advisory Committee for Aeronautics conceives an idea which he believes to be of a patentable nature he shall prepare a memorandum describing in detail such idea and the means which he proposes for its reduction to practice, and shall submit it through official channels to NACA headquarters together with a formal record of invention and disclosure of invention on forms NAVEXOS 2374 and 2375, respectively, or such other forms as may hereafter be prescribed. The memorandum shall include a statement describing the circumstances under which the invention was made, with particular regard to the conditions listed and defined in paragraphs 5 and 6, respectively, of these regulations.

(*b*) If a decision is reached to proceed with the procurement of a patent, the employee shall cooperate fully with patent counsel in the preparation of a patent application of such scope as will assure maximum protection of the Government's interests, and, subsequently, as may be required from time to time during the prosecution of the application, in the preparation of amendments responsive to Patent Office actions thereon.

20. *Responsibility of laboratory.*—

(*a*) The reporting of patentable inventions resulting from the research activities of the National Advisory Committee for Aeronautics is the joint responsibility of the supervisory personnel and individual employee who conceives the idea upon which the invention is based. A disclosure made by an employee shall be amplified, if possible, by the comments of his supervisors, and shall be transmitted through official channels to NACA headquarters with full information concerning the inventor's employment status and work assignment at the time the invention was made, and with definite recommendations regarding the initiation of patent action, and the respective rights to be claimed for the Government and for the employee.

(*b*) To avoid jeopardizing the interests of the Government, the laboratory shall promptly notify NACA headquarters of any public disclosure, by publication or otherwise, of any patentable developments of its employees not already protected by U.S. patent or patent applications.

Congress have a special space committee set up so that we can work with you on a civilian basis, having regard to the military aspects and the scientific aspects, both?

Would that be of help?

Dr. VON BRAUN. Sir, I believe it would be of great help indeed, and mainly for the following reason:

I think there is always the danger in a thing like the present space rush, that after the first excitement is over people might go to sleep again. Thus we may get a lot of money for 1 or 2 years, but then the space program may become ever less important as time goes on, particularly if the Russians do not come up with new surprises.

I think the most important single requirement of a sound national space program is that it be a sustained effort, so that we can really plan ahead, that we will know how much money will be available not only in 1958 but also in 1959, 1960, 1961, and 1962, and we really know that Congress and the American people mean business in taking up the Russian space challenge.

The question of patents was discussed as follows:

The CHAIRMAN (Representative McCormack). Doctor, in the contracts that Redstone makes under your authority for the Department of the Army with any private companies or laboratories—are they private companies, too? Do you make contracts with corporations?

Dr. VON BRAUN. Yes, sir.

The CHAIRMAN. Supposing they make any discoveries, does the Government get the benefit of those discoveries?

Dr. VON BRAUN. Yes, sir; the question of patent rights is tied up in the contract.

The CHAIRMAN. If you have occasion to contract with another company, you can let that other company know of these discoveries that were made?

Dr. VON BRAUN. Yes, sir. Anything that is being patented under a Government contract is Government property.

Representative Sisk asked:

It is your opinion that even though now and for the last few years we have been ahead in this field, unless we accentuate our own program of education, scientific development, that we can fall behind very shortly?

Dr. VON BRAUN. I would say we have been living off our capital in recent years. We are still in the fortunate position of at least not lagging behind them in the research field in general, but I think their momentum is so great that their field of progress in this field is already exceeding ours.

Unless we put more money and effort into basic research also, we may soon fall behind in that field.

Representative Keating asked Dr. von Braun if he would comment on the legislation setting up the new Space Agency.

Dr. VON BRAUN. Yes, sir. I am familiar with the administration bill called the Astronautics and Space Act of 1959.

and space activities; that such activities, except those of a military nature, shall be directed by a civilian agency; and that such activities shall be conducted so as to contribute to one or more of the following objectives: (1) the expansion of human knowledge of phenomena in the atmosphere and space; (2) the improvement of aeronautical and space vehicles; (3) the development of vehicles capable of carrying living organisms and equipment through space; (4) the establishment of long-range studies of the benefits, opportunities, and problems involved in space activities; (5) the preservation of the United States as a leader in aeronautics and space science; (6) the dissemination to agencies concerned with national defense of discoveries having military value; (7) the cooperation with other nations in space activities and the peaceful application of the result; and (8) the effective utilization of the scientific and engineering resources of the United States to avoid duplication of effort.

It established the National Aeronautics and Space Council composed of the President, the Secretary of State, the Secretary of Defense, the Administrator of the National Aeronautics and Space Administration, the Chairman of the Atomic Energy Commission, not more than one other member from a Federal agency, and not more than three members from private life.

It set forth the function of the Council as adviser to the President with respect to the performance of the following duties: (1) to survey aeronautical and space activities; (2) to develop a comprehensive program of aeronautical and space activities by Federal agencies; (3) to fix responsibility for the direction of major aeronautical and space activities; (4) to provide for effective cooperation between the National Aeronautics and Space Administration and the Department of Defense; and (5) to resolve differences arising among Federal departments or agencies with respect to aeronautical and space activities.

It established the National Aeronautics and Space Administration headed by an Administrator appointed by the President with the advice and consent of the Senate, and set forth the functions of the Administration to (1) plan, direct, and conduct aeronautical and space activities; (2) arrange for participation by the scientific community in planning scientific measurements and observations; and (3) provide for the widest practical dissemination of information concerning its activities and the results thereof. It conferred authority on the Administration for the performance of the above functions.

It provided for a Civilian-Military Liaison Committee consisting of a chairman appointed by the President with the advice and consent of the Senate, one or more representatives from each of the military departments, and one or more representatives from the Administration.

It directed the Administration and the Department of Defense to advise and consult with each other through the Committee on all matters within their respective jurisdictions relating to aeronautics and space activities.

It authorized the Administration to engage in programs of international cooperation pursuant to agreements made by the President with the advice and consent of the Senate.

Second, there has been a great deal said about the aspect of human adventure and exploration. I have no special advocacy of "the man in space" undertaking. I feel that it is something which men will wish to do and in due time will do. I think the incentives are of the same nature that Magellan must have had in starting around the world, namely, just to see what is around the world; and I do believe that, in the long term, human exploration of space will possibly be a sigficant field of human activity.

Thirdly, there is the application of new knowledge and techniques resulting from these investigations to the promotion of the intellectual agricultural and industrial capabilities of the Nation.

Fourth, there is the aspect of the advancement of international understanding by cooperation in undertakings which are naturally and necessarily of worldwide scope. The International Geophysical Year is certainly the most tangible and most well known example of such an undertaking.

And finally, there is the application of all the knowledge and techniques resulting from the above investigations to the development of military weapons systems and to the more effective conduct of offensive and defensive warfare.

In order that we may have as a nation an effective space program, there are two simple things required:

In the first place, we require enabling legislation which establishes an astronautical agency as a major Federal activity.

In the second place, we must have adequate funding on a long-term basis for the execution of this undertaking.

Many of us have been concerned with these questions for some time; and, as you probably know, various groups of us have developed informal proposals of this nature for several years.

Most of us believe that we will require something like $500 million a year for the civil space undertaking. I think one should have such a figure in mind when he is thinking of a vigorous national program.

c. Action taken

S. 3609 was amended and reported out of the Senate Special Committee on Space and Astronautics (S. Rept. 1701). A section on patents was included in the amended bill similar to the one added by the House.

d. Debates in Senate

S. 3609 was debated in the Senate on June 16, 1958. It contained a patent provision similar to the House bill, but this was deleted so that the whole subject could be discussed at the conference, and the conferees could attempt to evolve a section which would be satisfactory to both sides.

Senators Johnson of Texas, Bridges, Carroll, and Saltonstall were among those advocating passage of the bill. Mr. Saltonstall pointed

d. Debates in House

H.R. 12575 was discussed in the House, with almost no opposition expressed. Representatives McCormack, Arends, Brooks of Louisiana, O'Brien of New York, Metcalf, Natcher, Sisk, Ford, Haskell, Hays of Arkansas, and Holifield, all urged passage of the bill. On June 2, 1958, H.R. 12575 unanimously passed the House.

C. BILLS INTRODUCED AND CONSIDERED—SENATE

1. S. 3609, APRIL 14, 1958 (MESSRS. JOHNSON OF TEXAS AND BRIDGES)—85TH CONGRESS

a. Provisions

This bill was identical with H.R. 11881.

b. Hearings and significant testimony

Hearings were held before the Special Senate Committee on Space and Astronautics, May 6 through 15, 1958. In general, the problems discussed in the House hearings presented themselves in the Senate hearings.

(1) *Senator Lyndon Johnson*, chairman (pp. 1–8), presented the opening statement and outlined the main questions to be answered in the course of the hearings. He said:

> What is before us now is not a question of whether we should begin the orderly exploration of space but, rather, the question of how such exploration may best be directed and initiated. We are past the point of studying sketches. It is time to get the blueprints drawn and start pouring concrete for the foundation.
>
> There is an obvious need within our Government for a structure and organization to give purpose, direction, and impetus to the national effort. That is what this committee is here to consider and to recommend.
>
> We cannot expect and do not expect to resolve this question for all time to come. Knowing as little as even our best minds know about space, it would be the height of vanity for us to suppose that we could—in an age not yet 12 months old—settle national policy for decades or centuries ahead.
>
> On the contrary, our particular challenge—as I see it—is to devise a pattern which encourages rather than inhibits the full response of American initiative to the infinite challenges of outer space.
>
> If we create the agency which the challenge requires, it will be unlike rather than like anything now existing in the Federal Government. Certainly, it will require the closest attention from the Congress in the years immediately ahead to make certain that this potential is fully realized. For that reason, we must also make provision for Congress to give permanent attention to this new enterprise.
>
> Space, as I said, is a new dimension. Hence, it in no way detracts from or usurps the role of existing agencies or the

which was set up as a "body corporate." Under section 2, the National Academy, consisting of "not more than 50 ordinary members," was authorized to govern itself and was given the power to elect new members. Its actions, however, were to be reported to Congress. Section 3 set forth the duties of the Academy, stating:

> And be it further enacted, that the National Academy of Sciences shall hold an annual meeting at such place in the United States as may be designated, and the Academy shall, whenever called upon by any department of the Government, investigate, examine, experiment, and report upon any subject of science or art, the actual expense of such investigations, examinations, experiments, and reports, to be paid from appropriations which may be made for the purpose, but the Academy shall receive no compensation whatever for any services to the Government of the United States.

Although S. 555 was laid on the table at the time it was introduced,[69] it was reported in its original form to the Senate on March 3, 1863, and passed without discussion (Congressional Globe, pp. 1500–01).

Congressman Benjamin F. Thomas brought S. 555 to the attention of the House on the same day, and the House of Representatives, also without debate, passed the bill (p. 1540). On March 3, 1863, President Lincoln signed S. 555, and the National Academy of Sciences was established under the terms stated above.

2. LEGISLATIVE DEVELOPMENT

On July 14, 1870, the provisions of section 2 of the original act were changed in order to "remove the limitation of the number of ordinary members of said Academy as provided in said act." Minor changes in the Academy's powers were also made in the acts of June 29, 1884, and of May 27, 1914, which related to the holding of trust funds.

3. EARLY ACTIVITIES

The National Academy of Sciences met for the first time in New York on April 22, 1863. There, the Academy was divided into two classes, mathematics and physics, and natural history. Each of these classes contained five sections to which members were appointed. In subsequent sessions of the Academy, papers on scientific subjects were read and discussed.[70]

Probably the main purposes for founding the Academy were to honor capable scientists and to give scientific advice to the Government.[71] In order to carry out the latter function, the Academy appointed many special committees at the request of Congress and the executive departments. These committees carried out varied types of investigation as is shown by the examples below: [72]

Committee on Weights, Measures, and Coinage, 1863.
Committee on Magnetic Deviation in Iron Ships, 1863.
Committee on the Improvement of Greytown Harbor, Nicaragua, 1866.

[69] Congressional Globe, 37th Cong., 1st sess., p. 1155 (1863).
[70] National Academy of Sciences. A history of the first half-century of the National Academy of Sciences 1863–1913, pp. 25–102 (Washington, 1913).
[71] Id. at p. 14.
[72] Id. at pp. 201–205.

War, which the committee believes is equitable and just, based upon the varying lengths of time that different men were in the service.

The Senate committee issued its report on May 3, 1928. It was almost identical to the House report, quoted in part, above.

H.R. 10435, permitting the extension of a patent to any person who served honorably in the military or naval forces of the United States at any time between April 6, 1917, and November 11, 1918, was signed by the President on May 31, 1928, becoming Public Law 623.[114] Six patents were extended under this act.

B. WORLD WAR II

1. H.R. 1190, JANUARY 8, 1945 (MR. O'HARA)—79TH CONGRESS

This bill was introduced during World War II, and provided for the extension of the term of patents in the case of persons serving in the armed services during the war.

It provided:

> SEC. 1. That any person serving in the land or naval forces of the United States at any time during the period beginning December 7, 1941, and ending on the date of the termination of hostilities in the present war, as proclaimed by the President, who is on active duty, or who has been discharged or relieved from active service under honorable conditions, and who desires to secure extension of the term of a patent pursuant to this Act, may within six months after the date of his discharge or release from such service, whichever is the later, upon payment of a fee of $20, make a written application to the Commissioner of Patents, containing as a part thereof a statement setting forth—
>
> (A) that * * * [his patent] was granted prior to his entry into or during his period of service * * * the original term of which [patent] remains unexpired at the time of filing of the application;
>
> * * * * * *
>
> (D) the period of extension * * * shall in no case exceed a further term of three times the length of his said service * * *
>
> * * * * * *
>
> (F) that such extension shall in no way impair the right of anyone who before the date of enactment of this Act was bona fide in possession of any rights in patents or applications for patents conflicting with the rights in any patents extended under this Act, nor shall any extension granted under this Act impair the right of anyone who was lawfully manufacturing before the date of enactment of this Act the invention covered by the extended patent.
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> * * * * * *

[114] 45 Stat. 1012 (1928).

Langley Laboratory.[106] Other postwar accomplishments of NACA aeronautical research were reported in a statement by Senator John C. Stennis on May 5, 1955.[107] These included—

Discovery of a method to increase the speed of the Navy's F9F series of fighter planes.

Development of vertical takeoff and landing planes.

Use of water skis on such airplanes as the Navy's Sea Dart.

Development of afterburners which have been used on the F–84 Republic Thunderjet, F–86 North American Sabre, F–89 Northrup Scorpion, etc.

Methods of conquering the problem of icing on airplanes.

As of June 30, 1958, approximately half of the National Advisory Committee for Aeronautics' research was in the area of missiles and spacecraft. A "waffle grid" design was developed for space vehicles and missiles, and the NACA's blunt-nose design was used on all American ballistic missile warheads. The X–15 airplane, which will be used to gain information on weightlessness and other space travel problems, originated in NACA research.[108]

In conclusion, it may be said that the National Advisory Committee for Aeronautics played a significant and essential role in the development of American aviation. In 1955, Senator Flanders reported: "In the three fields of aerodynamics, powerplants, and aircraft structures, the NACA is the main source of aeronautical research information in this country."[109] It was in recognition of its important role that the National Advisory Committee for Aeronautics was made the nucleus of the National Aeronautics and Space Administration.

VIII. NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

A. BACKGROUND

One of the most recent developments in the attempt to encourage research and development by the U.S. Government, was the establishment of the National Aeronautics and Space Administration. The launching of the first earth satellite, Sputnik I, by the Soviet Union on October 4, 1957, awakened the United States to the urgency of stepping up and coordinating its research in the exploration of outer space. Only hard work and intelligent planning, it was recognized, could overcome this lag in the years ahead.

The Congress responded by holding interim hearings on the Nation's satellite and missile programs. From November 25, 1957, to January 23, 1958, the Preparedness Investigation Subcommittee of the Senate Committee on Armed Services heard approximately 70 experts and written testimony was submitted by about 200 others. On February 6, 1958, the Senate passed Senate Resolution 256, creating a Special Committee on Astronautical and Space Exploration to frame legislation for a national program. And on March 5, 1958, House Resolution 496 was passed by the House of Representatives, establishing a Select Committee on Astronautics and Space Exploration to investigate the problems and submit recommendations.

[106] U.S. National Advisory Committee for Aeronautics, Forty-Fourth Annual Report, 1958, pp. 26, 94.
[107] "Construction of Aeronautical Research Facilities." 101 Congressional Record, p. 5744.
[108] U.S. National Advisory Committee for Aeronautics, Forty-Fourth Annual Report, 1958, p. 30.
[109] Senate Committee on Armed Services. Report by Ralph E. Flanders on visit to the facilities of the National Advisory Committee for Aeronautics, p. 1 (1955).

ernment with other aspects of our military, foreign, technological, and economic policy. Many felt that science deserved a place in the Cabinet, with suggestions for the creation of a Secretary of Science.

The question of military versus civilian control was answered by the majority of the witnesses in favor of a civilian controlled agency, and that it should be oriented toward the broadest interests of the Nation. A large number of the witnesses stressed that, although the projects which are principally military in character should continue to be carried out by the Department of Defense, every precaution should be taken to insure that scientific and technical contributions extending beyond easily identifiable military requirements continue to be made and to be fully available to the national astronautics organization.

The majority of the witnesses agreed that the new Agency could absorb the present staff and facilities of the National Advisory Committee for Aeronautics, but the responsibilities should be broadened to make policy at the highest national level.

There was almost unanimous sentiment against having a so-called crash program, and it was stressed that only a sustained and intensive effort over many years would bear useful fruit. Also, a sustained flow of money—steady appropriations by the Congress—would be needed: the new national agency not only must meet current high-priority needs, but must foster the very long leadtime, broad-based scientific efforts that must be started now if in 10 and 20 years we hope to be ahead in the field of space exploration. It was suggested that Congress set up standing committees on outer space.

It was emphasized that there must be a liberal policy of freedom of research, and liberal exchange of information. The problems of security of information in the space program are not the same as those of atomic energy in 1946. It was pointed out by many witnesses that instead of having a near monopoly of technical know-how, we lag behind our strongest foreign rival. The hampering restrictions of secrecy should be eliminated as much as possible if all our scientific resources are to be applied successfully. This freedom of information, it was brought out, does not apply only to ourselves, but can play a vital role in directing astronautics toward peaceful applications throughout the world. Most witnesses felt that whatever might be lost by "giving away" information to other countries, would almost certainly be more than offset by the greater interchange of information both at home and abroad that would result if the crippling rules of security were reduced.

The question of patent rights was not discussed at any length in the hearings, but the few times it came up in the testimony has been included in the summation of the witnesses' views.

Space law was discussed in the hearings, and was felt to be necessary to prevent anarchy in the use of outer space. Domestic legislation and international agreements, it was felt, could do much to forestall unnecessary future conflicts.

It was emphasized by the majority of the witnesses that the exploration of outer space was no longer hypothetical and remote, and some of the scientists outlined projects which needed only a go-ahead signal and funds to begin their translation from plan to reality. The greatest need is for the creation of a comprehensive, national step-by-step plan; projects with long leadtimes needing their first component

theory in terms of the observations, will make weather forecasting an exact science. I predict that knowledge of weather alone, in its value to the country, will greatly outoutweigh the cost of the entire program.

I think there will be many, many great advantages that will come, as we might say, on the side.

Dr. Whipple stressed the need for freedom of information in research, and presented a report on the damaging effects of the security classification to the progress of science. The losses to the scientists' individual progress and to the general progress of science occur in the following ways:

1. By not being aware of the efforts by others, the scientist fails to contact able men who might give him specific assistance in his own problems.

2. The scientist may waste time solving problems that have already been solved, or proved insoluble. Such unnecessarily wasted effort is devastating to the creative urge.

3. The scientists may lose the inspiration normally attained through broad contact with other scientists in widely diversified fields.

4. The scientist fails to gain new ideas by reading the general scientific literature, particularly in fields somewhat away from his own endeavor. Hence, the cross-fertilization obtained by applying techniques in one area of research into another area is greatly hampered.

5. The scientist tends to concentrate on a narrower field of endeavor and loses breadth of view.

6. Lack of broad contacts makes it much more difficult for the scientist to obtain a quick check on the validity of a new idea or technique. Since only a small percent of new ideas turn out to be of value, he will tend to get into the habit of discarding those new ideas that cannot be checked within his narrow range of information, or worse, of not seeking new ideas.

7. The lack of criticism by others in his subject, and the lack of immediate or possibly even ultimate criticism of his efforts, not only hampers the scientist in obtaining the correct or inspired scientific results, but also leads him to an attitude of less self-criticism and less scientific rigor. There can be no doubt that sometimes the cover of security classification is used to hide inferior scientific contributions.

8. The training of new scientists as graduate students is seriously impaired by security classification.

9. The handling of classified material and the maintenance of security wastes the scientist's time, consumes his energy, and creates nervous tension. This is particularly true for the scientist whose institution does not accept classified contracts or who must, for other reasons, work in relative isolation.

10. The nuisance of security checks on open publication and the complications of classified publications reduce the outflow of a scientist's published contributions.

This is particularly true since the new agency could retain the successful experience and excellent relationships of NACA.

In addition, in my opinion, the importance of this subject is such as to justify its assignment to a particular agency with the specific purpose assigned to it here.

In this way the hard-won lessons of the past will assist us to make the most rapid possible progress in developing the means for exploration and of actual flight in outer space.

Furthermore, the vast new horizons that will be opened up by progress in this area of scientific activity are of concern to very many segments of the national community; they include, but stretch far beyond purely military considerations.

Finally, a civilian-led program would place this country in a position to cooperate with other nations with respect to conquering the problems of space exploration, and would better assure a cooperative world reaction than would an effort conducted by the military.

The impetus for a determined effort in the direction of space exploration was, as you know, provided by the International Geophysical Year.

(11) *Frederick C. Durant III*, former president, American Rocket Society, and International Astronautical Federation (pp. 1028–1079), suggested that the following programs be established in conjunction with any national space agency:

1. A program to collect and disseminate information regarding plans and progress of the U.S. space flight program, as well as those of other countries.

2. The establishment of a significant number of graduate level scientific research scholarships with credit for advanced academic degrees.

Such scholarships should be on a funded basis, based upon international competition as well as, perhaps, on an exchange basis.

3. A continuing program of international competition with regard to experimental research to be conducted in U.S. satellites.

4. I propose that the United States take the initiative and, through the United Nations, call for an "International Conference on the Peaceful Applications of Rocket Power."

Finally the United States has the opportunity to become a leader in astronautics and to share with other nations our plans and programs for space research. The return benefits which could accrue to the United States would be positive and widespread; not only from a scientific and technical standpoint, but from the respect and enthusiasm we will elicit for sharing with others our astronautical heritage.

c. Action taken

A new bill, H.R. 12575, was reported out of the House Select Committee on Astronautics and Space Exploration on May 24, 1958 (H. Rept. 1770). (1) It declared the policy of the United States that

He stated the various reasons for opposing the particular bill as follows:

> H.R. 65 corresponds to H.R. 3069 and S. 840 of the 79th Congress. This bill provides for the general extension of all patents which were in force during the war for a period equal to the duration of the war, or in the case of patents which were granted or which expired during the war, for a period equal to the time that the patent was in force during the war.
>
> There are no restrictions, no limitations, just a blanket extension of all patents that were in existence during the war period. Of course, administration in a bill of this kind would be nonexistent, because the law automatically would extend the term of all the patents. Roughly, there might be more than 100,000 patents that would be involved.
>
> The bill is not limited to those patents which were affected by the war—where the patentee was unable to operate because of war conditions—but includes all patents, even those where the war may have caused the patentee to obtain greater profits than he would have otherwise.
>
> H.R. 1984 is practically the same as H.R. 2043 of the 79th Congress. It provides for the extension of the term of any patent when the patent owner had not obtained a reasonable reward or compensation for his efforts due to the war, periods of national emergency, or unforeseen circumstances. In this bill, the extensions are limited to a certain class of patents, but they are not limited to those that were affected by the war, the bill applies to patents that were affected by an unforeseen circumstance which may arise in the future.
>
> H.R. 1107 is a duplicate, with one exception, of H.R. 6346, as it passed the House of Representatives. * * * The bill * * * is patterned after the law enacted in 1928, and differs only in a few respects from it. * * * The general position of the Patent Office in opposition to extensions of patents applies to bills of this kind, and the Patent Office has in the past opposed legislation to extend patents to compensate for the war period, including bills on behalf of persons that served in the military services.

(3) *Col. George W. Gardes*, representing the War Department (pp. 27–28), said that the War Department was not in favor of H.R. 65 and H.R. 1984 because they provided benefits to patent owners without requiring the showing of injury or loss as a result of war, and would afford unjust enrichment. They would also create a "future and presently incalculable potential liability for the patent infringement by the War Department as well as by other Government agencies."

(4) *Hon. Fritz G. Lanham*, former Congressman and member of the House Patents Committee (pp. 32–36), said that he was opposed to the general legislation. He felt that the veteran should be required to show that he was injured materially with reference to the advantages that he might have obtained under his patent.

c. Reports

At the conclusion of the hearings, the subcommittee prepared a clean bill, H.R. 4304, which was reported out by the committee (see infra).

However, the bill was passed over when it reached the Senate floor on July 29, 1956 (Congressional Record, p. 13917), and the legislation did not materialize in the 84th Congress.

A number of bills were introduced in the 85th Congress, but no hearings were held and no legislation ensued.

IV. INDIVIDUAL EXTENSIONS—SPECIAL BILLS

A. ART METAL WORKS, INC. (PRIVATE LAW 554, DEC. 23, 1944)

1. BACKGROUND

Art Metal Works brought an infringement suit under Aronson patent (No. 1,673,727; reissue No. 19,023) against Abraham & Straus, based upon its sale of cigarette lighters manufactured by Evans Case Co. The district court's holding that the patent was valid and infringed was affirmed on appeal. *Art Metal Works* v. *Abraham & Straus*, 61 F. 2d 122 (2d Cir. 1932).

Shortly thereafter, the defense moved to reopen the case for presentation of further evidence. The motion was granted, with Judge Manton presiding. The court suspended the former decision and allowed the case to be further contested by Evans, on the theory that trade announcements by Art Metal Works were so exaggerated and overdrawn in character as to constitute "inequitable conduct" or "unclean hands," which would justify the denial of relief to the patent owner. *Art Metal Works* v. *Abraham & Straus*, 62 F. 2d 79 (2d Cir. 1932).

The reopened proceedings allowed by Judge Manton at the instigation of Evans in 1932 were dragged out until 1934. In the meantime, Evans was encouraged by its relations with Judge Manton to put on the market a still further competing lighter closely similar to that covered by the Aronson patent, whereupon Art Metal filed a new infringement suit in the same court and involving the same parties. In 1934, both suits came before the circuit court of appeals, Judge Manton presiding. Both were decided in favor of Evans and its customer, Abraham & Straus. Judge Manton, speaking for the court, held that the third form of Evans' lighter was not an infringement and that relief to the patent owner for infringement arising out of the first and second forms of Evans' lighter should be denied. *Art Metal Works* v. *Abraham & Straus*, 70 F. 2d 639; same, 70 F. 2d 641 (2d Cir. 1934).

Evans' infringement went on throughout the United States, undisturbed and beyond any power of the patent owner to prevent it until the year 1939, when Judge Manton's criminal acts in the Abraham & Straus litigations were exposed. Judge Manton was found to have accepted a bribe from the Evans Case Co. Petitions were granted to Art Metal to reopen the two adverse decisions previously rendered by Judge Manton. *United States* v. *Manton*, 107 F. 2d 834 (2d Cir. 1939).

The final decisions in this case reversed Judge Manton's decisions, and Art Metal was reinstated to its patent rights. *Art Metal Works* v. *Abraham & Straus*, 107 F. 2d 940; same, 107 F. 2d 944 (2d Cir. 1939); cert. den. 287 U.S. 657.

ence with their right to patent protection for a definite period of time, regardless of how often it would be interrupted by national emergencies or other conditions. Maybe that is why, in the Constitution, it provides that patents shall be granted for periods of "times," and the word is used in the plural.

The guarantee of this patent protection does not require an appropriation of any moneys by the Congress, but reinstates a right or a remedy for the breach of the original contract the inventor had with the Government.

(8) *The Patent Law Association of Chicago* (pp. 113–114) presented its objections as follows:

In general, these bills violate the fundamental patent-law concept of giving the public the right to use an invention at the end of a stated period of time. These bills substitute for the public's right to compete after a fixed period a windfall right to the patentee for making additional profits, and places upon the public a commercial adversity due to the fact that the patent can be extended. This is not the promotion of science to which the patent laws should be directed.

These bills are an unjustified outgrowth of the act of June 30, 1950. This act authorized extending patents wholly owned by armed-service men. Its justification was patriotic. The right of extension expired June 30, 1951. By the act of July 1, 1952, the benefits of the earlier act were extended to armed-service men who owned only a part of a patent. The right of extension terminated January 1, 1953. We note that this second bill conferred a windfall on citizens who were not connected with the armed services, but solely with a serviceman. There is no justification for benefiting such individuals.

The bills under consideration have forgotten the armed-services man. They ask for patent extension for private parties who for some reason have not exploited their patent.

Our association opposes the bills because—

1. They represent class legislation, extending preferential treatment to a particular group because of, what we regard, a "risk of business."

2. They substantially increase the administrative burden in the Patent Office without providing the funds necessary to sustain the burden.

3. Several give preferential treatment to the U.S. Government upon extension of the patents. This is contrary to precedent and is unsupported by logic.

4. The constitutionality of these bills is questionable. The Constitution uses the words "limited times" in defining the grant which the Congress might give. These words emphasize the importance of a definite termination date for the patent monopoly. In authorizing the Patent Office to extend patents, these bills do not provide a sufficient standard, as required by the courts, for proper delegation of congressional power. Unlike the act of June 30, 1950, the constitutionality of these bills is not aided by patriotic motives and war powers.

individuals or special groups. As the law now provides no machinery for granting justice to injured patentees, this subcommittee frequently has been called upon to consider individual cases through the instrumentality of private bills. It is no disparagement of this subcommittee to say that it is not equipped to pass on the merits of individual claims. That is a burden which should not be thrust on any congressional committee.

In most foreign countries, I understand, the law provides for prolongation of patents, when their enjoyment has been frustrated by governmental restrictions.

I believe it is high time that the law in this country should do justice along similar lines. Congress should lay down a general rule and permit its application to individual cases through administrative or quasi-judicial channels. That is the purpose of H.R. 4054. * * *

(2) *John Hoxie*, chairman of the committee on patent law and practice, New York Patent Law Association (pp. 6–20), presented a report by his association, which summarized its conclusions opposing the bills as follows:

The committee is opposed to both bills in principle because it believes—(1) that they rest on a misapprehension of what the patent right is; (2) that they are inherently discriminatory; and (3) that the administrative problem of granting extensions for the reasons made operative by these bills would be unduly great.

The committee is further opposed to H.R. 4054, and to H.R. 323 in its comparable effect, because too much time has elapsed to permit equitable redress now for World War II situations.

The committee also opposes the extension, under any circumstances, of expired patents, a result contemplated by both bills. As applied retroactively to World War II situations, such extensions—really revivals—would recreate inequity in their effect upon investments, commitments, and plans made in reliance on the normal expiration of patents. In its prospective application, H.R. 323 would create an uncertainty as to the expiration of all patents, which would unduly burden and impede industrial development.

(3) *William B. Barnes*, an inventor (pp. 85–91), was one of several representatives from small businesses and individual inventors who testified in favor of the legislation, telling of their losses during the war because of inability to get materials and equipment. Mr. Barnes described the difficulties that the independent investors and small businessmen face in making the most of inventions, and the obstacles they must overcome. Some of these were (1) the invention must be marketable; (2) the timing must be good; (3) advantageous commercial arrangements must be made; and (4) domination by prior patents must be avoided. In the face of these difficulties, Mr. Barnes said:

the surprising thing is that a man is still willing to take his chances in the field of invention. He does it only because society makes with him a bargain. In return for the full dis-

It is true, of course, that the only statutory grant a patentee receives by the issuance of a patent is the right to exclude others. However, the right to exclude others includes, among other things, the right on the part of the patent owner to waive the exclusion and to grant a license on his patent to others, or to assign or sell the patent to others. If Government stop orders prohibit the using of the patent or prevent the exploitation, promotion or development of the patent so that it cannot be licensed to others, then it interferes with the patentee's exclusive use.

In addition, while a patentee has a statutory grant to exclude others, he also has, coupled with that grant, the common-law right to make, use, and exploit his invention as he sees fit. These two rights go together and, for all practical purposes, the right of exclusive use cannot be enjoyed save with the common-law right. The late Mr. Chief Justice Taft aptly stated the relationship in *Crown Co.* v. *Nye Tool Works* (261 U.S. 24, 36):

"It is the fact that the patentee has invented or discovered something useful and thus has the common-law right to make, use, and vend it himself which induces the Government to clothe him with power to exclude everyone else from making, using, or vending it. In other words, the patent confers on such common-law right the incident of exclusive enjoyment and it is the common-law right with this incident which a patentee or an assignee must have. That is the implication of the descriptive words of the grant 'the exclusive right to make, use, and vend the invention.' The Government is not granting the common-law right to make, use, and vend, but it is granting the incident of exclusive ownership of that common-law right, which cannot be enjoyed save with the common-law right."

An inventor has no legal obligation to reveal his secrets to the world. However, in order to induce him to make known his discovery so that the Nation as a whole may profit thereby, the Government in exchange for his public disclosure and dedication agrees to secure to him the exclusive use of his invention for a full period of 17 years. That is the inducement which the Government has long been offering by law and upon which inventors have been led to rely.

Since the public emergencies of World War II and the Korean conflict forced the Government to abridge the special obligations it assumed by the issuance of patents, it is the considered opinion of the committee that, in order to make good on its original undertaking, the Government should extend the term of such patents for periods corresponding to that during which the normal use or development of the patent was prevented or substantially curtailed.

CLASS LEGISLATION

Another argument raised against patent extension legislation is that such legislation would single out a particular group for benefits, and as such is inequitable and unfair to