*functions of this subsection in such organizational structures. No Office of Research and Technology Applications or other organizational structures performing the functions of this subsection shall substantially compete with similar services available in the private sector.*

Subsection (c) identifies a number of specific functions which will aid in the achievement of technology transfer throughout the Federal laboratory system. It will be necessary that each agency further define these functions in accordance with its peculiar characteristics. The concluding paragraph of subsection (c) permits an agency, such as NASA, which already has extensive technology transfer programs outside its laboratories, to carry out the bulk of these functions in its existing programs.

Subsection (c)(1) requires that an application assessment be prepared for each R. & D. project at the laboratory which has potential for successful application in State and local government or in private industry. It is not intended that every R. & D. project be formally assessed. Rather, it is left to the discretion of those agency personnel assigned to the Research and Technology Applications Offices to determine when, how, and for which R. & D. activities such an assessment must be prepared. The only criterion provided by the Act is that an assessment is required when an R. & D. project is determined to have potential for successful application in State and local government or in private industry. The Act's intent is to encourage the Research and Technology Offices to constantly scrutinize laboratories' R. & D. activities at all stages with a view toward the possibility of successful technology transfer to State and local government and private industry.

Subsection (c)(2) requires the Research and Technology Applications offices to provide and disseminate information on products, processes, and services which have potential application to State and local government and to private industry. The intent is to provide the potential user the opportunity to receive information directly from the source of the technology rather than indirectly from third parties. However, it is not the intent of this subsection that existing information dissemination services be duplicated where they effectively communicate such information.

Subsection (c)(3) requires each Research and Technology office to cooperate with the Center for the Utilization of Federal Technology and other organizations that act as overall links between the R. & D. resources in the Federal government and potential uses in State and local government and private industry. Again the intent is to provide to the potential user greater access to the source of technical assistance through the facilities offered by such crosscutting organizations as the Center for the Utilization of Federal Technology.

Subsection (c)(4) identifies an extremely critical function of the Research and Technology Applications Offices with regard to technology transfer to State and local governments. Subsection (c)(4) recognizes that technology transfer must, to be effective, consist of more than information dissemination. Technical assistance, often in the form of person-to-person assistance, is also required. Where feasible, personnel from laboratories which are the source of useful technologies should be committed to assist State and local officials in their attempts to apply these technologies to their specific needs. Each agency, in

consultation with its laboratories and the Center for the Utilization of Federal Technology shall determine how requests for assistance from State and local officials shall be received and processed.

The final sentence of subsection (c) recognizes that, in some instances, the services available at the Research and Technology Applications Offices, or other Federal organizations performing the functions of the subsection, may compete with similar services available in the private sector. Where this is the case, care must be taken to avoid the duplication of these privately offered services. However, in some instances, especially with regard to State and local government needs, private services, although available, may prove too costly to be prevailed upon. In such cases, the Research and Technology Applications offices may provide similar services.

*(d) CENTER FOR THE UTILIZATION OF FEDERAL TECHNOLOGY.—There is hereby established in the Department of Commerce a Center for the Utilization of Federal Technology. The Center for the Utilization of Federal Technology shall—*

*(1) serve as a central clearinghouse for federally owned or originated technical information having potential application in State or local government or industry including at least (A) all application assessments prepared pursuant to subsection (c) (1) and (B) federally owned patents;*

*(2) coordinate the activities of the Offices of Research and Technology Applications of the Federal laboratories;*

*(3) utilize the expertise and services of the National Science Foundation and the existing Federal Laboratory Consortium for Technology Transfer, particularly in dealing with State and local governments;*

*(4) receive requests for technical assistance from State and local governments and refer these requests to the appropriate Federal laboratory;*

*(5) provide funding, where necessary, for Federal laboratories to provide the assistance specified in subsection (c) (4); and*

*(6) utilize such technology transfer mechanisms as are appropriate, including but not limited to, personnel exchanges and computer-based systems.*

Subsection (d) establishes, in the Department of Commerce a single Center for the Utilization of Federal Technology (CUFT). CUFT is already being established in the Department of Commerce and the Act, therefore, merely provides a legislative basis for it.

Because the various Federal agencies will operate their technology transfer programs under guidelines which may be diverse, there will be a need for a centralized mechanism for communication and coordination. CUFT is established to act as this centralized mechanism.

It is not the intent of Congress that CUFT should challenge the jurisdiction of any agency over its laboratories. Rather, the intent is to establish a single focus for outside contact with the laboratories and to facilitate interagency communication.

Where possible, CUFT is to use existing mechanisms for the performance of its functions. For example, as subsection (d) (3) indicates, CUFT is required to utilize the expertise and services of the National Science Foundation and the Federal Laboratory Consortium for Technology Transfer in accomplishing its tasks. By using existing

organizations, CUFT should be able to act as an effective channel for cooperative efforts and for transferring knowledge between agencies, between laboratories, between Governmental jurisdictions, and between the Government and the private sector in the most cost-effective manner.

The intent of Subsection (d)(5) is to provide CUFT the authority to fund, at its discretion, certain technology transfer activities at Federal laboratories, especially those requiring technical assistance to State and local governments, which might otherwise not be provided. For example, a technology developed at a Federal laboratory may be identified by the Research and Technology Applications Office at that lab as useful to some segment of State and local government but in need of further refinement in order to be readily adaptable to the specific needs of the potential users. When funds are not available to adapt the technology through the individual agency, CUFT may elect to provide the necessary funding assistance. Priority should be given to adapting those products, processes, or services which will have the widest application to State and local government needs.

Paragraph (d)(5) should not be construed as an entitlement; it only provides permissive authority. Funds would be available only when provided in the CUFT budget. State and local governments would also have the option of reimbursing the laboratory or agency for technical services, provided the agency has authority to accept such reimbursement.

*(e) AGENCY REPORTING.—Each Federal agency which operates or directs one or more Federal laboratories shall prepare annually a report summarizing the activities performed by that agency and its Federal laboratories pursuant to the provisions of this section. The report shall be transmitted to the Center for the Utilization of Federal Technology by November 1 of each year.*

In accordance with the Act's intent that CUFT be a focus for information on agency-wide technology transfer efforts, subsection (e) requires that each Federal agency subject to the requirements of section 11 shall prepare an annual report on its technology transfer activities and submit it to CUFT by November 1 of each year. With this information, CUFT should be in a position to assess, on an annual basis, the efforts of the Federal government with regard to the mandates of this Act and, when requested, report on these efforts to Congress.

### N. SECTION 12—NATIONAL TECHNOLOGY MEDAL

***SEC. 12. NATIONAL TECHNOLOGY MEDAL.***

*(a) ESTABLISHMENT.—There is hereby established a National Technology Medal, which shall be of such design and materials and bear such inscriptions as the President, on the basis of recommendations submitted by the Office of Science and Technology Policy, may prescribe.*

*(b) AWARD.—The President shall periodically award the medal, on the basis of recommendations received from the Secretary or on the basis of such other information and evidence as he deems appropriate, to individuals or companies, which in his judgment are deserving of special recognition by reason of their outstanding contribu-*

*tions to the promotion of technology or technological manpower for the improvement of the economic, environmental, or social well-being of the United States.*

*(c) PRESENTATION.—The presentation of the award shall be made by the President with such ceremonies as he may deem proper.*

This section creates the National Technology Medal to be awarded to individuals or companies in recognition of an outstanding contribution to the promotion of technology or technological manpower in the national interest. This activity is in accordance with one of the initiatives called for in the President's industrial innovation message. The provision would establish the legislative basis for a National Technology Medal similar to that of the National Medal of Science.

O. SECTION 13—PERSONNEL EXCHANGES

***SEC. 13. PERSONNEL EXCHANGES.***

*The Director and the National Science Foundation, jointly, shall establish a program to foster the exchange of scientific and technical personnel among academia, industry, and Federal laboratories. Such program shall include both (1) federally supported exchanges and (2) efforts to stimulate exchanges without Federal funding.*

Section 13 mandates the creation of a joint NSF/DOC program of personnel exchanges between industry, academia, and Federal laboratories designed to encourage intersectoral cooperation and understanding and to provide education and training to promote technological innovation. The Science Faculty Professional Development Program at the National Science Foundation, as noted earlier, is one such activity of personnel exchange. The committee directs the Foundation not to decrease funds available in this program for year-long awards to experienced, full-time 2- and 4-year college and university science teachers who are involved primarily in undergraduate science instruction to increase their competence in science, as it increases funding for the type of exchanges mandated by the bill.

The Department of Commerce is planning for a fellowship program to be administered by the Center for the Utilization of Federal Technology. In its initial stage, this effort is expected to place individuals from private industry in the Federal laboratories to track user needs and potential applications of Federal technology.

The most extensive program of personnel exchanges of this type, which is compatible with this Act, is that established and operated under the Intergovernmental Personnel Act of 1970. This legislation created a program of grants and training assistance designed to give State and local personnel the administrative, professional, and technical skills vital to governmental operation. Grants are made available to non-Federal jurisdictions for programs to develop and institute improved administration methods. State and local employees may be permitted to participate in Federal training programs under the provisions of this law and funds are designated for these governmental units to provide training and education to develop such skills. Of primary importance with respect to S. 1250 is Title IV which allows for the temporary assignment of personnel from States and localities to the Federal Government and vice versa.

The mandate for the exchange program has been left purposely broad to allow for flexibility in program development. An example of what the Committee would consider as a viable plan for such an individual academic/industry exchange activity is the following:

DESCRIPTION OF PROGRAM

The program would encourage the exchange of individual researchers between the academic and industrial sectors. Individuals would spend from 3 to 12 months working in areas of high technology science and engineering. It would have between 200 and 500 participants per year. The exchanges could be arranged on an individual basis (or through a clearing-house, within the Department of Commerce Office of Industrial Technology). Industrial participants would spend their time at an academic department in the capacity of research associates or lecturers or both. Academic participants, (who would most likely be tenured faculty members from Ph. D. degree granting institutions) would spend their time at an industrial research or manufacturing facility, working on an industrial project. The project would not be restricted to generic research, but could include proprietary work as well.

AIMS OF PROGRAM

A program such as this would complement the centers for Industrial Technology by exposing more individual scientists to the unique situations, constraints, and problems of each sector. The development of such an understanding should help with: (1) more efficient communications, (2) exchange of information, and (3) attention to manpower needs and training for Ph. D. scientists.

FUNDING

The best method for funding would be that in which the industrial concerns were to support the entire program, with the incentive that they could deduct the direct expenses as part of a research tax incentive approach, similar to that in the "Vanik Bill". This would remove Government from direct financing and operation of the program.

Other alternatives are for the establishment of a new sabbatical program within N.S.F. which would cover the academic participants' costs. Industry would still be responsible for its costs. However, this removes some of the incentives.

P. SECTION 14—AUTHORIZATION OF APPROPRIATIONS

**SEC. 10. *14.* AUTHORIZATION OF APPROPRIATIONS.**

**(a) There is authorized to be appropriated to the Secretary for purposes of carrying out section 6, not to exceed $19,000,000 for the fiscal year ending September 30, 1981, $40,000,000 for the fiscal year ending September 30, 1982, $50,000,000 for the fiscal year ending September 30, 1983, and $60,000,000 for each of the fiscal years ending September 30, 1984, and 1985.**

**(b) In addition to authorizations of appropriations under subsection (a), there is authorized to be appropriated** *to the Secretary* **for purposes of carrying out the provisions of this Act, not to**

**exceed $3,000,000 5,000,000 for the fiscal year ending September 30, 1981, $5,000,000 $9,000,000 for the fiscal year ending September 30, 1982, and $10,000,000 $14,000,000 for each of the fiscal years ending September 30, 1983, 1984, and 1985.**

**(c) Such sums as may be appropriated under subsections (a) and (b) shall remain available until expended.**

*(d) To enable the National Science Foundation to carry out its powers and duties under this Act only such sums may be appropriated as the Congress may authorize by law.*

S. 1250 authorizes a total of $285 million over five fiscal years (1981–1985) to carry out the mandate of the Act. No funds are authorized to the National Science Foundation; rather NSF funds for the purposes of the bill are to be included in the annual NSF authorization bill so as not to proliferate the Foundation's authorizations and to permit the Committee to consider the Foundation's program balance.

A five-year authorization is provided to ensure the continued support of the innovation program. The Committee's breakdown of the funds authorized is as follows:

[In millions of dollars, fiscal years]

| | 1981 | 1982 | 1983 | 1984 | 1985 | Total |
|---|---|---|---|---|---|---|
| Purpose: | | | | | | |
| Centers | 19 | 40 | 50 | 60 | 60 | 229 |
| Other | 5 | 9 | 14 | 14 | 14 | 56 |
| General | (3) | (5) | (10) | (10) | (10) | |
| CUFT | (1.2) | (2) | (2) | (2) | (2) | |
| Personnel | (0.8) | (2) | (2) | (2) | (2) | |
| Total | 24 | 49 | 64 | 74 | 74 | 285 |

For fiscal year 1981 the Department of Commerce has requested $1.2 million for the Center for the Utilization of Federal Technology and $7.2 million for the Office of Productivity, Technology, and Innovation, (including $5.2 million for the Cooperative Generic Technology Centers). Thus the Administration's request corresponding to the authorization of this bill for fiscal year 1981 is $8.4 million. The increase of the bill from the request is intended to convey a much larger sense of concern for the nation's economic condition and of expectation that the programs of the bill will help rectify that condition.

It should be noted that H.R. 7115, the House version of the NSF Authorization Bill includes three items which are relevant to the provisions of S. 1250. The Committee's report on the fiscal year 1981 NSF Authorization (Rpt. No. 96–999) instructs the Foundation not to spend less than $1.8 million for three university-based innovation centers and includes $2 million for a new generic technology center. The latter was included in the President's first budget request for fiscal year 1981, but was dropped from the revised version. The House bill also authorizes $2.4 million for the Science Faculty Professional Development Program.

The Committee emphasizes that the amount of funds authorized for the innovation centers is modest compared to the $4.9 billion the Federal Government has budgeted for basic research in fiscal year 1981.[2]

[2] Shapley, Willis H., Albert H. Teich, Gail J. Breslow, and Charles V. Kidd. Research and Development AAAS Report V. Washington, American Association for the Advancement of Science, 1980. p. 17.

## V. SUMMARY OF TESTIMONY OF HOUSE HEARINGS ON UNIVERSITY-INDUSTRY RELATIONS AND SENATE HEARINGS ON S. 1250

At the request of the Subcommittee on Science, Research and Technology, the Science Policy Unit of the General Accounting Office undertook an analysis of the records of the House hearings on university-industry relations (which included testimony on H.R. 4672, the House counterpart to S. 1250) and the Senate hearings on S. 1250. The complete analysis has been published by the Committee on Science and Technology.[1] The Introduction and Background and Summaries of the analysis, as prepared by the General Accounting Office, follow. In this material quotes excerpted from the record are referenced by (H:pp) for the House hearings and (S:pp) for the Senate hearings.

The General Accounting Office was not asked to analyze the hearings on the role of the Federal laboratories in domestic technology transfer or the hearing on the President's Industrial Innovation Initiatives, so issues in those areas are not included in the analysis.

### Introduction and Background

Industrial innovation is the process of converting an idea into a commercially suitable product. It encompasses the discovery of new theories in basic science; testing, evaluating, and replicating those discoveries through experimentation and theory refinement; applying the findings to industrial problems and interests; developing and marketing economically feasible products; and finally incorporating those products into American industry. As such, industrial innovation is constrained by what we know, by the methods we use in our science laboratories, and by the decisions and commitments our industries make based on their assessment of profits and losses.

In response to a growing belief that industrial innovation in the United States is faltering, the Congress and the executive branch have proposed ways to enhance and stimulate technological innovation in this country. Central to many of these proposals is the idea that improved collaboration between universities and industry (particularly in the areas of research, training, and education) will promote innovation and increase productivity.

The Federal Government is expected to facilitate this collaboration. Its role as facilitator has been justified on the grounds that the social gains that may result from improved collaboration warrant the use of national resources. The argument is that without help from the Government, collaboration would not improve, or would not improve fast enough to attain the national goals of increased innovation and productivity.

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[1] Summary of House and Senate Hearings on Government-University-Industry Relations", Committee on Science and Technology, U.S. House of Representatives, 96th Congress, Serial SS, June 1980.

In 1979, your Subcommittee on Science, Research and Technology of the House Committee on Science and Technology held hearings on "Government and Innovation: University-Industry Relations."[2] These hearings included consideration of the House version of the National Science and Technology Innovation Act of 1979, H.R. 4672. The Senate version of the same Act (S. 1250) was discussed in hearings held by the Subcommittee on Science, Technology, and Space of the Senate Committee on Commerce, Science, and Transportation.[3] Both hearings were concerned with the condition of American industrial technology and with university-industry relations. Although the Senate hearings addressed primarily the former concern, and the House hearings the latter, both bills propose that public resources be used to encourage more interaction between universities and industry.

In opening remarks before the House hearings, Mr. Brown stated that the hearings were to be "an examination of the linkages between the nation's universities and industry—and by industry we mean all private enterprise—with a view towards improving those linkages for the purpose of making society more innovative and productive. We are particularly eager to determine what the appropriate role of the federal government is in building these linkages." (H:1) He also stressed a need "to try to understand broadly what industry and universities think of each other and to identify and understand the various opportunities for cooperation between the two sectors." (H:4)

## Summary of Part I: Issues on University-Industry Relations

We organized witnesses' comments around four questions, which we identified as the main issues relevant to university-industry relations:

What is the problem?
How can improved university-industry relations help?
What needs to be done?
What is Government's role?

Witnesses generally agreed that an innovation problem exists in the United States. Those who commented explicitly on the problem described it as decline in U.S. competitiveness in world markets because we lag behind other nations in technological innovation. Witnesses differed about the relative importance of university-industry relations as a source of the innovation problem. However, they generally agreed that better university-industry relations would enhance innovation.

Witnesses felt that there has been a "relative weakening of the links between industry and universities" in the years since World War II. (S:27) The Federal Government's significant increase in funding university research was the reason most often cited for this "relative weakening." Witnesses considered the increased funding as respsonible for redirecting university missions and interests toward Government problems and away from industry problems, thereby weakening university-industry relations.

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[2] The House hearings were conducted on July 31, Aug. 1, and Aug. 2, 1979.
[3] The Senate hearings took place on June 21, June 27, and Nov. 21, 1979.

Efforts to improve university-industry relations are hindered by two types of barriers: those arising from institutional differences between the sectors, such as different research orientations, management philosophies, goals, and objectives; and barriers of attitude—the preconceived notions of disdain and distrust each sector has about the other.

### How Can Improved University-Industry Relations Help?

Witnesses described numerous instances of past interaction between universities and industry that have successfully stimulated innovation: semiconductors, magnetism, lasers, synthetic fibers, antibiotics. They also discussed the unique roles each sector plays in innovation. They generally agreed that, although the functions of universities and industry are often blurred, universities play a vital role in basic research and in education and training, and that industry's most important role is to develop and market new products and services.

Several witnesses said that recent events have created an environment in which the incentives for improving university-industry interaction have become increasingly compelling for both groups. For different reasons, each views increased interaction as not only desirable but increasingly supportive of their respective goals. A better relationship between the two sectors was seen as benefitting universities by providing them with an alternative to Government funding, more stable funding, employment opportunities for students, and access to industrial research equipment. Industry was expected to gain by using universities as inexpensive supplements to in-house research, as sources of employees, and as neutral and credible sources of information.

### What Needs to be Done?

Discussions about what needs to be done to improve university-industry relations focused on "ingredients for success" and the need for new, improved mechanisms for transferring knowledge from one sector to the other. The most important ingredients for success were seen as strong leadership and personal commitment of key individuals in both sectors, and flexible institutional policies (particularly the policies practiced by universities).

Some witnesses were concerned that, lacking better transfer mechanisms, new knowledge developed in universities would benefit foreign industry considerably more than American industry. Others questioned whether existing mechanisms are adequate for the future. Several witnesses cited lessons learned from past experience. They argued that knowledge transfer is most successful and useful when high-technology firms are involved, or when industrialists are strongly coupled "to the scientific and tecchnological world around them"—particularly to academic institutions.

Opinions about the potential effects of increased university-industry collaboration were also expressed. Some witnesses were concerned about the effects of collaboration on the university's integrity and mission, particularly in terms of the university's vital roles in education and training and in basic research.

## What is the Role of Government?

Three issues emerged from discussion of university-industry collaboration: the pros and cons of two different rationales for a Government role, precedents for a Government role, and specific actions Government can take to improve university-industry relations.

The first rationale discussed by witnesses was based on the example of other industrialized nations whose governments actively participate in advancing industrial technology in their countries. Those who supported this idea recommended that if the United States emulated these nations, we, too, could reap the benefits of enhanced innovation. Others, however, argued against emulating other nations because of substantial differences in culture, economics, politics, and institutions.

The second rationale for a Government role addressed the nonappropriability of returns from technological development. Several witnesses felt that Government should support technological development that might produce substantial social benefits when the private sector cannot promote such a development because profits are not easily realized by individual firms. Those endorsing this rationale classified generic technologies [4] as nonappropriable activities.

Considerable attention was paid to previous and ongoing Government efforts to encourage university-industry collaboration. The agricultural extension program was the most frequently cited example of successful interaction among Government, universities, and industry that has stimulated innovation. Other witnesses doubted the applicability of the agriculture model because of differences between agriculture and other industries in terms of user homogeneity, competitive structure, capital needs, and technology transfer needs and mechanisms.

The National Advisory Committee for Aeronautics was considered an excellent model for today's proposals to develop generic technologies through cooperation among Government, industry, and academia. The Route 128/Silicon Valley experience was described as an example of how Government-funded university research has stimulated commercial activity that has resulted in unexpected industrial growth.[5]

Several witnesses suggested specific actions that Government might take to facilitate university-industry relations:

Change fiscal policies to encourage industry to take advantage of university research (e.g., tax credits).

Increase Federal funding of basic research.

Supply incentives for universities to develop relationships with industry (e.g., a program of planning grants tied to that goal; matching grants).

Provide direct Federal support to universities to strengthen dissemination of research findings.

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[4] A generic technology is one that can be used by many different industries. Welding is an example.

[5] A number of private R&D firms are located on Route 128 in Massachusetts and in the Santa Clara (i.e., "Silicon") Valley of California. Their organization and growth were influenced by Federal support of research conducted by nearby universities.

## Summary of Part II: Issues Related to S. 1250 and H.R. 4672

Part II of appendix I describes the opinions of witnesses and individuals who submitted materials for the hearings records on the legislative provisions of H.R. 4672 and S. 1250. These bills have been introduced to achieve the broad goal of enhancing technological innovation in the United States. They are premised on three central assumptions:

1. Current U.S. economic problems are at least partially the result of a slowdown in the rate of technological innovation.
2. This slowdown can be reversed by a focused Government effort aimed at increasing industrial innovation. Such an effort requires the creation of a new Federal office that will monitor, organize, and promote industrial innovation.
3. As part of its oversight of industrial innovation, this Office would coordinate university and industry inputs into the innovation process.

Based upon these premises, the bills propose two new Government programs: (1) an Office of Industrial Technology with a mission to track technological needs, opportunities, and developments; and (2) a mechanism for Government to help industry through creating Centers of Industrial Technology at universities. The Centers are intended to enhance the capacity of people from industry and academia to participate in innovative technological activities.

Witnesses supported the overall intent of the legislation, which they saw as a step toward increasing Government-industry cooperation in the area of technological innovation. But there was some concern about whether a new Government entity, such as the proposed Office of Industrial Technology, is the most appropriate vehicle for achieving this end. To avoid duplication in agency goals and programs, witnesses recommended a close examination of the relationship between the proposed responsibilities for the Office of Industrial Technology and existing activities of the Department of Commerce (DOC) and the National Science Foundation (NSF). Witnesses also raised questions about whether the Office should engage in strategic planning and research and the appropriate location of the Office within the Government.

Similar concerns were voiced about how adequately the bills delineate the composition and functions of the Industrial Technology Review Panel, the advisory group created to oversee the functioning of the Office of Industrial Technology. Questions about the Panel's composition focused on the balance of representation from Government, the public, and various parts of the industrial and financial communities. Witnesses questioned whether the Panel should be limited to an advisory role, or it should be allowed to actively participate in governing programs initiated by the Office of Industrial Technology.

The legislative provisions covering the establishment and operation of the Centers for Industrial Technology were also discussed. Reactions to each provision fell into two categories: (1) whether or not the provision could achieve its intended purpose, and (2) how precisely

the legislation should specify ways to establish and run the Centers and to what extent such issues should be left to the discretion of administering agencies.

Some of the major questions addressed were:

Should the Centers be located at universities? There was almost an even split of opinion expressed on this issue. Some witnesses said that universities, because of their commitment to basic research and training and their reputation for objective research on controversial issues, are ideal sites for developing new technologies. Others described the hostility of universities to applied research and, more generally, to industry. They concluded that this attitude would make universities inappropriate hosts for the Centers.

Should the two separate objectives of training individuals for innovation and of performing cooperative research be housed in the same Center? Witnesses from NSF and from NSF-funded "innovation centers" felt that these two objectives are qualitatively different and should be the focus of different Centers.

Should the Centers engage in "defensive R&D," i.e., research oriented to regulatory concerns? Witnesses with opinions on this question unanimously opposed this provision in the legislation, arguing that other Federal agencies already devote sufficient resources to research of this type.

Should Centers develop mechanisms for disseminating their findings in a form useful to industry? Most witnesses agreed that improving mechanisms for transferring research results to industry would be critical to the success of the Centers.

Should the legislation specify an industrial clientele for the Centers? Those addressing this issue said that the legislation should define explicit categories of industrial clientele for the Centers to ensure that the needs of small businesses and individual entrepreneurs are met.

Should the legislation include more incentives for industry's participation in the Centers? Most of the witnesses commenting on this issue felt that the legislation should encourage industrial participation in the Centers by explicitly addressing industry's concerns about exclusivity of licenses, proprietary control over information, and antitrust implications.

Should DOC, NSF, or both agencies have primary responsibility for selecting and funding Centers? Most witnesses supported a role for NSF because of NSF's experience with universities and with cooperative research. In the event that both DOC and NSF are responsible for administering the Centers, agency responsibilities must be clearly delineated and coordinated to avoid jurisdictional conflict and duplication of effort.

Should industry or universities determine the research agenda of the Centers? Opinions were evenly split on this question.

Should industry and Government share the costs of funding the Centers; should Government phase out its funding over a fixed period of time? There was general agreement that cost-sharing between Government and industry is a key element in cooperative research arrangements, since cost-sharing indicates the utility of the Centers to industry. Witnesses disagreed, however, over whether Government

should set a time limit for phasing out its support of the Centers. Some argued that too great an emphasis on reaching self-sufficiency might distract the Centers from their primary goal of responding to society's technological problems.

How much funding should be authorized initially to create Centers? Suggestions for funding levels and the criteria to determine the levels of funding varied considerably. One witness advocated linking Government investments in the Technology Centers to the amount other countries invest in a given technology; another said that Government investments should vary according to the cost of equipment necessary for developing a given technology.

Would the Centers be a necessary or important Government contribution to the innovation effort? While most witnesses favored the Centers for Industrial Technology, many said that the Centers would not be an adequate approach to the innovation problem. According to such witnesses, the Centers are unnecessary because:

1. Industry already supports research through existing mechanisms and on its own initiative.
2. Innovation problems derive from a restrictive business environment, not a need to replenish the supply of new technology.
3. The innovation process is not understood well enough to warrant implementing an initiative of this sort.
4. The approach taken to increase industrial innovation in these two bills might not result in significant changes in innovation activity unless accompanied by other policy changes. A number of witnesses felt that for H.R. 4672 and S. 1250 to be successful, changes in the innovation "environment," which is heavily influenced by Government policies, would be needed first.

## VI. OVERSIGHT ACTIVITIES

The following account of oversight activities is made pursuant to clause 2(1)(3)(A) of rule XI and under the authority of rule X, clause 2(b)(1) and clause 3(f) of the Rules of the House of Representatives.

Committee oversight of innovation and productivity issues has consisted of an intense program of hearings and study in the Subcommittee on Science, Research and Technology, hearings and study of high-technology small business through the Subcommittee on Investigations and Oversight, and hearings and symposia of the full Committee.

The Committee's oversight findings and recommendations are contained in the views compiled in the body of this report and in other reports and releases of the Committee and of its subcommittees.

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## VII. OVERSIGHT FINDINGS AND RECOMMENDATIONS BY THE COMMITTEE ON GOVERNMENT OPERATIONS

Pursuant to clause 2(b)(2) of Rule X and clause 2(1)(3)(D) of Rule XI of the Rules of the House of Representatives, the following oversight findings and recommendations made by the Committee on Government Operations have been received: No statement of findings and recommendations was received as of July 21, 1980.

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## VIII. REFERENCE TO THE CONGRESSIONAL BUDGET ACT

The bill S. 1250 does not create budget authority or direct spending. Consequently, section 308(a) of the Congressional Budget Act of 1974 does not apply. No funds for State or local financial assistance are included in S. 1250.

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## IX. COST ESTIMATE AND COMPARISON, CONGRESSIONAL BUDGET OFFICE

Pursuant to section 403 of the Congressional Budget Act of 1974 and to clause 2(1)(3)(C) of Rule XI of the Rules of the House of Representatives, the following report of the Congressional Budget Office is included:

CONGRESSIONAL BUDGET OFFICE—COST ESTIMATE

JULY 18, 1980.

1. Bill number: S. 1250.

2. Bill title: Stevenson Technology Innovation Act of 1980.

3. Bill status: As ordered reported by the House Committee on Science and Technology, July 2, 1980.

4. Bill purpose: The bill would authorize the Department of Commerce (DOC) and the National Science Foundation (NSF) to support Centers for Industrial Technology. It would establish an Office of Industrial Technology (OIT) in DOC, and provide a legislative basis for the Office of Productivity, Technology, and Innovation (OPTI), which is being formed in DOC. S. 1250 would require Federal laboratories to establish Research and Technology Applications Offices, and create a single Center for Utilizing Federal Technology (CUFT).

The bill would allow the President to award a National Technolgy Medal to recognize individuals making outstanding contributions to technology. It would require DOC and NSF to establish a personnel exchange program, and would establish a 16-member National Industrial Technolgy Board.

S. 1250 authorizes to be appropriated a total of $285 million for fiscal years 1981 through 1985 for activities of the Centers and the other programs. In addition, the bill provides that one-half of 1 percent of the research and development budget for each agency with a Federal laboratory be targeted for technology utilization efforts. The President's 1981 budget includes new initiatives to support technological innovation, with approximately $8.4 million targeted for activities similar to those authorized in S. 1250.

5. Cost estimate:

| | *Millions* |
|---|---|
| Authorization level: | |
| Fiscal year: | |
| 1981 | $24 |
| 1982 | 49 |
| 1983 | 64 |
| 1984 | 74 |
| 1985 | 74 |
| Estimated outlays: | |
| Fiscal year: | |
| 1981 | 12 |
| 1982 | 32 |
| 1983 | 52 |
| 1984 | 66 |
| 1985 | 72 |

The costs of this bill fall within budget subfunction 376.

6. Basis of estimate: For the purposes of this estimate, it is assumed that the entire amount authorized will be appropriated prior to the beginning of each fiscal year. Outlays are estimated to be 50 percent the first year, 30 percent the second year, and 20 percent the third year, based on information provided by DOC.

7. Estimate comparison: None.

8. Previous CBO estimate: On May 6, 1980, CBO prepared a cost estimate for S. 1250, as ordered reported by the Senate Committee on Commerce, Science and Transportation, April 20, 1980. The Senate

Committee version of S. 1250 authorizes appropriations of $267 for fiscal years 1981 through 1985 for similar programs promoting innovation in technology.

## X. COST AND BUDGET DATA

In accordance with the requirements of section 252(b) of the Legislative Reorganization Act of 1970 and pursuant to Clause 7 of Rule XIII of the Rules of the House of Representatives, the committee estimates the costs to be incurred by the Federal Government during the current and five subsequent years as a result of the enactment of this legislation as follows:

| | Funds appropriated pursuant to authority in this bill that would not otherwise be appropriated | Funds for utilization of Federal technology that would not otherwise be appropriated | Total |
|---|---|---|---|
| Fiscal year: | | | |
| 1981 | $8,400,000 | 0 | $8,400,000 |
| 1982 | 49,000,000 | $20,000,000 | 69,000,000 |
| 1983 | 64,000,000 | 21,000,000 | 85,000,000 |
| 1984 | 74,000,000 | 22,000,000 | 96,000,000 |
| 1985 | 74,000,000 | 23,000,000 | 97,000,000 |
| 1986 | 0 | 24,000,000 | 24,000,000 |

## XI. EFFECT OF LEGISLATION ON INFLATION

In accordance with Clause 2(1)(4) of Rule XI of the Rules of the House of Representatives, the following statement is made concerning the inflationary impact of the legislation: The costs of the bill are only a tiny portion of the national economy and are assessed to have no adverse inflationary effect on prices and costs in the economy in either the long run or the short run. The bill is designed specifically to improve innovation and productivity in the economy, and in the medium to long run (within two years and then continuing) the bill is assessed to have a strong positive impact on the reduction of inflation.

## XII. COMMITTEE RECOMMENDATION

The bill was ordered reported on July 2, 1980 by the Committee by voice vote.

## XIII. ADMINISTRATION VIEWS

In addition to testimony presented at hearings on the subjects of this bill, comments on the bill as reported by the committee have been received from the Department of Commerce, the National Science Foundation, and the Department of Justice. These views follow:

## A. Department of Commerce

GENERAL COUNSEL OF THE
UNITED STATES DEPARTMENT OF COMMERCE
Washington, D.C. 20230

18 JUL 1980

Honorable Don Fuqua
Chairman, Committee on Science and Technology
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

There is presently pending before your Committee the report on S.1250, a bill ordered reported,

> "To promote United States technological innovation for the achievement of national economic, environmental, and social goals, and for other purposes."

In ordering the bill reported your Committee made substantial revisions to S. 1250 as passed by the Senate, some of which cause the Administration very serious concern. We hope that before the bill is considered on the floor the Committee will reconsider its action and further amend the bill as set forth below.

Subsection 11(b) requires each Federal laboratory to establish a research and technology applications office to provide and disseminate information on Federally-owned or originated technology to State and local governments and to private industry and to provide technical assistance when requested by State and local government officials. Each Federal laboratory with a budget in excess of $20 million would be required to assign at least one professional full-time to the office and, starting with fiscal year 1982, each Federal agency which operates or directs a National laboratory would be required to set aside 0.5 percent of the agency's research and development budget to support technology transfer functions at the agency and its laboratories. Subsection 11(c) sets forth functions for the offices and subsection 11(e) establishes reporting requirements.

As the other Federal agencies have stated in letters to you, the Administration believes the policy of set asides as stipulated in subsection 11(b) is neither administratively sound nor appropriate. Not all Federal laboratories have research programs which generate significant quantities of information which could be usefully transferred. It would be wasteful to require these laboratories to establish technology transfer offices. Yet other laboratories utilize centrally-located staffs serving several laboratories to accomplish technology transfer. The Administration believes the responsibilty for creating and structuring laboratory offices should be left to the Executive Branch.

The specified minimum staffing requirement and budgetary set aside are also objectionable. As the other Federal agencies have detailed to you, the set aside dictates a multimillion dollar program in a whole range of agencies at the expense of other existing and important programs. Further this provision has been added by the Committee outside the normal Congressional authorization and appropriation process and without any of the normal scrutiny associated with the Executive budget process.

For these and other compelling reasons such as the requirement in subsection 11(d)(5) that the Center for the Utilization of Federal Technology, despite no money being included in the President's budget for that function, fund, where necessary, the laboratories' costs of providing technical assistance under subsection 11(c)(4) to State and local governments, we believe that subsections 11(b), (c) and (e) should be deleted from the bill.

Subsection 11(d) establishes a Center for the Utilization of Federal Technology (CUFT) in the Department of Commerce to serve as a central clearinghouse for Federally-owned or originated technical information. We are already planning to establish a similar entity by the same name in the National Technical Information Service of this Department for fiscal year 1981. The President has requested $1.2 million to fund CUFT in fiscal year 1981. In order to make subsection 11(d) consistent with the President's planned activities for CUFT and the deletion of subsections 11(b), (c), and (e), we recommend that it be renumbered subsection 11(b) and revised to read:

(b) CENTER FOR THE UTILIZATION OF FEDERAL TECHNOLOGY--

There is hereby established in the Department of Commerce a Center for the Utilization of Federal Technology. The Center for the Utilization of Federal Technology shall--

(1) serve as a central clearinghouse for the collection, dissemination and transfer of information on Federally-owned or originated technologies having potential application to State and local governments and to private industry;

(2) use appropriate technology transfer mechanisms such as personnel exchanges and computer-based systems;

(3) use the expertise and services of the National Science Foundation and the existing Federal Laboratory Consortium for Technology Transfer, particularly in dealing with State and local governments; and

(4) receive requests for technical assistance from State and local governments and refer these requests to appropriate Federal laboratories.

The bill would direct the Secretary of Commerce to establish an Office of Industrial Technology headed by a Director and would assign the Director a variety of duties designed to enhance technological innovation in the United States. Rather than assigning these duties and authorities directly to the Director, the bill should be revised to assign them to the Secretary. This would be consistent with existing legislative authorities exercised by such Departmental operating units as the Patent and Trademark Office, the National Bureau of Standards (NBS), and the National Technical Information Service (NTIS). Consistent with the proposed reorganization of this Department's Office of Science and Technology and the proposed renaming of the Assistant Secretary for Science and Technology as the Assistant Secretary for Productivity, Technology and Innovation, we plan to have the Director report to this Assistant Secretary. Accordingly, we recommend that the references in sections 6 and 7 to the Director be revised to be references to the Secretary and that the first sentence of subsection 5(c) be revised to read:

(c) Duties.--The Secretary, through the Director, on a continuing basis, shall --.

The bill would require that the Director be appointed by the President, by and with the advice and consent of the Senate. Consistent with our planned reorganization, we believe that the Director should be appointed by the Secretary rather than by the President. We also believe it would be premature to make the Director an Executive Schedule level V. Therefore, we recommend that subsection 5(b) be revised to read:

(b) Director.--The Secretary shall appoint a Director of the Office.

Subsection 6(e) deals with the disposition of inventions conceived or made under the auspices of a Center for Industrial Technology supported at least in part by Federal funds. This provision, for the reasons set forth in a letter to you from the Department of Justice, is inconsistent with the provisions of H.R. 6933, the Administration's omnibus patent policy bill. It must be stressed that our objection is not merely based on the substance of the differences; even more importantly we oppose the legislative creation of yet another "special case" patent policy. A uniform government-wide patent policy is needed to eliminate the confusion and disincentives inherent in the vast array of statutes and regulatory authorities

establishing patent policies for the Federal agencies. We would prefer that the bill be silent on the issue of patent policy, letting this Department's patent policy, as that of the supporting agency, govern allocation of patent rights pending enactment of uniform government-wide patent policy legislation such as H.R. 6933.

Subsection 6(f) would require a mandatory antitrust review by the Attorney General before a Center for Industrial Technology can be established. In recognition that establishment of some Centers may involve only antitrust questions that can be satisfactorily resolved without review by the Attorney General by reference to existing law and announced positions of the Department of Justice, that antitrust questions needing review by the Attorney General may arise subsequent to establishment of a Center as planned activities change, and to make clear that the antitrust laws remain applicable regardless of any opinion issued by the Attorney General, we recommend that subsection 6(f) be revised to read as follows:

> (f) Additional Consideration.--The Secretary may request the Attorney General's opinion whether the proposed joint research activities of a Center would violate any of the antitrust laws. The Attorney General shall advise the Secretary of his determination and the reasons for it within 120 days after receipt of such request. However, the establishment of a Center, the rendering of an opinion by the Attorney General, or any other activity undertaken or approved under this Act shall not convey to any person, association, corporation or other business organization, immunity from civil or criminal liability, or create defenses to actions under any antitrust law.

Section 8 would authorize the National Science Foundation (NSF) to provide assistance for the establishment of Centers. We support NSF's suggestions that section 8 could be dispensed with because the National Science Foundation Act provides NSF with ample authority with respect to Centers and that appropriate conforming changes be made elsewhere.

Section 10 of the bill would establish a National Industrial Technology Board (NITB) to advise the Secretary and the Director as to the activities of the Office of Industrial Technology and as to any other matters that the Secretary or the Director refer to it. This section is unnecessary, removes needed administrative flexibilities, and will be expensive. The existing Commerce Technical Advisory Board (CTAB) which is chartered (copy attached) under the Federal Advisory Committee Act presently performs many of the same types of tasks specified for the NITB. Its members serve on an expenses only basis, at the will of the Secretary, while members of the NITB would have fixed statutory terms of office and could receive

compensation at the daily rate of a GS-18 as well as expenses. We estimate that compensation for the NITB members could exceed $50,000 per year. Because the CTAB exists under Executive Branch charter rather than being legislatively created with fixed terms, members may be added or dropped from the Committee at the will of the Scretary as special expertise is or may no longer be needed. The existing CTAB has an outstanding record of performance and we are opposed to any attempt to replace it with another committee. Accordingly, we believe that the bill should be revised to delete section 10. At most, the bill should only require that the Secretary assign the functions specified for NITB to an appropriate advisory committee.

Section 14, which authorizes the appropriation of funds, should be revised to be in accordance with the President's budget request for fiscal year 1981 ($5.2 million for the Centers for Industrial Technology, identified as the Cooperative Generic Technology (COGENT) program in the President's budget, and $1.2 million for CUFT) and to provide an authorization of such sums as may be necessary for future fiscal years.

Finally, to reflect the Administration's and Congress's concern for involvement by minority firms, entrepreneurs, and inventors in technological innovation, research and development, we request that the following language be incorporated in the Committee report on the bill:

> The greater use of minorities in the scientific and technological fields would contribute significantly to the development of American industry to its full technological potential. The innovative talents of this segment of our economy could greatly enhance our overall national scientific technological capability.
>
> To address this problem, the Minority Business Development Agency (MBDA) of the Department of Commerce has, through its Industry and Technology Program, established and is utilizing a national system of Technology Commercialization Centers. These Centers serve as brokers between private and public sector markets and programs and minority concerns producing or seeking innovative concepts, designs and goods.
>
> It is expected that the entities created by this Act will assist and cooperate with the MDBA Program and its system of Centers.

We have been advised by the Office of Management and Budget that there is no objection to the submission of this letter to the Congress from the standpoint of the Administration's program.

Sincerely,

Homer E. Moyer, Jr.

Homer E. Moyer, Jr.
General Counsel

## B. National Science Foundation

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

nsf

OFFICE OF THE
DIRECTOR

JUL 16 1980

Honorable Don Fuqua
Chairman, Committee on
Science and Technology
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

Thank you for your letter of July 1, 1980, inviting comments from the National Science Foundation on S.1250, The Stevenson Technology Innovation Act of 1980. We understand that S. 1250, as amended and reported to the full Committee on Science and Technology by the Subcommittee on Science, Research, and Technology, has not yet been reported by the full Committee. Its focus appears to be on industrial innovation in those sectors of the economy that, unlike defense, energy, and health, are not currently within the mandate of any specific agency. Industrial innovation is also, as you know, the focus of continuing attention by the Administration and, in particular, by the National Science Foundation and the Department of Commerce.

We are anxious to work with the Committee in constructive partnership to help reverse the troublesome decline in industrial innovation. S. 1250 could be the focus for such cooperation. As you know, however, there were no hearings before the Subcommittee on the amendments it has added and no request for comments from the affected agencies. In particular, the agencies have not had an opportunity until now to comment fully by testimony or letter on the provisions relating to technology transfer by Federal laboratories and centers.

As indicated in Dr. Atkinson's brief letter to you of June 30, the NSF would appreciate an opportunity to be heard on the Subcommittee amendments that will affect the NSF before final action is taken. At the same time, we recognize the late-session pressures that have been moving the Committee to early action. Under the circumstances we hope that the Committee will consider changing the bill before floor action to reflect comments from the NSF and other affected agencies.

RECEIVED

JUL 17 1980

COMMITTEE ON SCIENCE
AND TECHNOLOGY

Technology and Innovation Centers at NSF

As the Committee knows, the National Science Foundation has pioneered in establishing technology and innovation centers of the types envisioned in the key provisions of S. 1250. Dr. Atkinson described what we have been doing in testimony on earlier versions of the bill. We fully expect to keep doing those things and to expand our efforts in keeping with the President's Innovation Initiative so far as the realities of budget constraints permit. Issues of budget priority within and between agencies would, of course, continue to be addressed through the budget, authorization, and appropriations process whether or not S. 1250 mentions the NSF.

S. 1250 as proposed and as it passed the Senate did not mention the NSF, being intended primarily to provide the Commerce Department with new impetus, authority, and structure in this area. The NSF believes an expanded Commerce Department role is desirable. We gather that the Subcommittee added reference to the NSF in order to recognize and reinforce the NSF's role as well. We appreciate that intent and want to express our strong positive response to it.

At the same time, however, the NSF does not need more authority for technology and innovation centers; the National Science Foundation Act already provides ample authority, and we have been using that authority extensively. The duplicate authority provided by this bill would carry new requirements for which we see no need. In particular, the special patent and antitrust procedures of section 6(e) and (f), as applied to the NSF by section 8(a) [last sentence], would be unnecessary and disruptive, at least in their present form.

Section 6(e) would provide a separate patent policy regime for one program or one small group of programs. This is inconsistent with efforts currently under way in the Congress, and backed by the Administration through its support of H.R. 6933, to establish a uniform policy governing inventions that result from Federally supported research. Moreover, the proposed separate regime would confront NSF staff, grantees, and actual or potential licensees with a separate set of rules and regulations to cope with. This would be tolerable if some improvement in our policy were effected by it. In fact, however, the difference between the proposed regime and what the NSF has been doing in this context under our existing patent policy would be only technical, not substantive.

So far as we are aware, none of those involved in our existing innovation and technology centers has had any difficulty with the application of our existing patent policy to them. Nor has any member of Congress expressed any concern in that regard. On the contrary, the NSF has been complimented on the flexibility and enlightennment of its patent policy in this and other contexts. Apart from creating a paper symmetry with the provisions affecting the Department of Commerce, therefore, the application of 6(e) to the NSF would accomplish nothing of value.

Section 6(f) would require that before an award could be made to establish an Industrial Technology Center, the supporting agency would have to obtain from the Attorney General an opinion on whether the joint research done there would violate the antitrust laws. In some cases this could create an unnecessary and undesirable procedural obstacle.

Clearly, Government support or sponsorship of such a Center would not convey any antitrust immunity, and both the establishment of the Center and the ancillary arrangements for it would be subject to antitrust scrutiny. For that reason, either the NSF or the participants in the Center might very well wish to seek an antitrust opinion from the Justice Department and perhaps also from the FTC. Indeed, the NSF and OSTP have just such a request pending at this time in connection with the proposed Ocean Margin Drilling Program, and the industrial participants have insisted on a provision requiring an opinion from Justice as a condition for their participation even in the first year of the Program.

However, other Centers might involve no antitrust questions that cannot be satisfactorily resolved by reference to existing law and announced positions of the Justice Department. For example, we believe innovation centers of the kind described in section 6(b)(2) do not often involve antitrust problems. Even centers for joint research activity may in our view raise no novel antitrust problems that will require resolution by the Justice Department, particularly once the Department publishes its planned Antitrust Guide for Research Joint Ventures. The anticipated Guide will contain a detailed exegesis of antitrust law and enforcement policy affecting both the establishment of such ventures and their ancillary arrangements. We understand that it will probably include specific examples on which sponsoring agencies and the center participants will be able to draw in constructing their arrangements and evaluating antitrust consequences.

Thus in certain cases antitrust advice will be necessary or desirable. In other cases, however, such advice could be unnecessary and constitute only a paperwork obstacle and source of delay for the centers and an undue burden on the Antitrust Division. Again, moreover, we are aware of no complaint or concern that any of the past or present centers established with NSF support were or are anticompetitive; we have always been careful about that. Why then is this additional requirement necessary?

We should perhaps add that we have invariably found the Antitrust Division helpful, thoughtful, and reasonable. Our concern is not that they would impose any inappropriate obstacle to any research joint venture the NSF would want to sponsor. It is that submitting each and every center for review that seems truly called for in some cases but not in others would involve wasted effort and delay.

Should there be any doubt that the antitrust laws apply to centers established under this bill as they would to any other such ventures, we see no reason why an appropriate savings clause would not suffice to meet that concern. Given an opportunity to consult with the Committee, the Justice Department would undoubtedly be able to suggest language for such a clause.

Thus, we believe that section 8 of the bill could be dispensed with -- though with the understanding that no reduction or retreat from the NSF role in the area is implied. Or, if section 8 were retained, we would recommend that the last two sentences of section 8(a) be dropped.

Technology Transfer at National Laboratories and Centers

Our second major comment relates to section 11 of the bill, dealing with "Utilization of Federal Technology". Subsection (b) of that section would require establishment at every Federal laboratory and research center (sweepingly defined in section 4 of the bill) of an Office of Research and Technology Applications. It would also specify staffing for these offices at laboratories or centers above a certain size, and it would require each agency that funds such laboratories or centers to set aside for these offices and other technology-transfer activities a specified percentage of its total R & D budget, without regard to the nature of the agency's laboratories and centers or their relationship to the total budget affected. We appreciate the impulse behind these proposed requirements and the wish to emphasize the importance of technology transfer efforts. But in our view the requirements themselves would be unwise and administratively unsound.

In general, legislative prescription of administrative structures and staffing patterns at this level of detail seems to us inappropriate and intrusive on functions of the Executive branch and its managers. Applied to laboratories and centers many of which have been deliberately placed under independent operation, it seems especially so. In a number of cases, moreover, such as NSF astronomy centers (including one in Chile), it is not obvious what the required offices would usefully be able to do.

Much the same objection applies to detailed set-asides of particular budget shares for special functions, such as would be proposed here. What this amounts to, to the extent the function is not already being funded, is establishment of a new program in each of a whole range of agencies (totaling many millions of dollars, including roughly $4.5 million at NSF alone) at the expense of other existing and important programs (since no new money is appropriated), with none of the normal scrutiny associated with the Executive budget process or the Congressional authorization and appropriation process. We would like to express a strong objection to this feature of the bill and to its introduction into the bill without hearings or any other opportunity for affected agencies and constituencies to comment.

Indeed, the subjects dealt with in section 11 might generally profit from more opportunity to draw on existing experience and to discuss arrangements with the Federal laboratories and other interested parties. Achieving effective technology transfer in this context (or any other) is not simple and involves tricky issues of avoiding competition with commercial engineering and consulting firms.

In addition, the definition of "Federal laboratory" in section 4(7) is a source of concern to us. We believe it is unduly vague and sweeping. For example, it appears to encompass NSF national research centers that perform basic research in astronomy or the atmospheric sciences, from which immediate technology transfer could be very limited at best. We share with other agencies an added concern over the reach of the undefined and open-ended term "center".

In closing I would like to reiterate the interest of the National Science Foundation in working with the Committee to address broadly the stimulation and dissemination of industrial innovation in the U.S. economy. Whatever the fate of particular provisions in this bill, that matter will continue to deserve priority attention from all of us.

The Office of Management and Budget has advised us that there is no objection to the submission of this report from the viewpoint of the Administration's program.

Sincerely yours,

Donald N. Langenberg

Donald N. Langenberg
Acting Director

## C. Department of Justice

U. S. Department of Justice
Office of Legislative Affairs

Office of the Assistant Attorney General — Washington, D.C. 20530

JUL 18 1980

Honorable Don Fuqua
Chairman, Committee on Science and Technology
House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

S. 1250, the "Stevenson Technology Innovation Act of 1980", is now pending before your Committee. The bill in a different form passed the Senate on May 28, 1980. Although we testified before a Senate Subcommittee on the Senate version of the bill, we have not yet given our views to any Committee or Subcommittee of the House. We would like to do so in this letter.

Our comments address the implications of this bill only for antitrust, competition and government patent policy. The Department does not at this time take any position on the other policy issues involved in this legislation or on the need for legislation of this general type. The Department suggests herein the addition of an antitrust savings clause to further clarify the fact that the activities of Centers for Industrial Technology created under the bill are not in any way immune from attack under the antitrust laws. Also, the Department objects to the patent provisions of the bill because they are inconsistent with H.R. 6933, the Administration's bill to create a uniform government patent policy, now scheduled for mark-up before the House Subcommittee on Courts, Civil Liberties and the Administration of Justice.

A. Suggested Antitrust Amendment

From the perspective of antitrust and competition policy, the most important provisions of S. 1250 are §§ 6-8. Those sections would require establishment of an Office of Industrial Technology within the Department of Commerce, would require the Director of that Office and the National Science Foundation (NSF) to provide assistance for the establishment of Centers for Industrial Technology (Centers), and would provide seed money for certain research and development programs undertaken by those Centers. These Centers would be affiliated with universities or other nonprofit institutions and would strive for technological innovation through cooperative activities between those institutions and private industry.

S. 1250 may permit direct competitors in an industry, through joint funding of a Center, to coordinate their basic and applied R&D programs. Because of this coordination, Centers have some anticompetitive potential, and must be structured and operated in ways that do not run afoul of the antitrust laws. This Department has previously given views on the applicability of the antitrust laws to joint research ventures such as the Centers. See Statement of Ky P. Ewing, Jr., Deputy Assistant Attorney General, Antitrust Division, Department of Justice, National Technology Innovation Act: Hearings on S. 1250 Before the Subcommittee on Science, Technology, and Space of the Senate Committee on Commerce, Science and Transportation, 96th Congress, 1st Sess 153 (1979). In sum, while joint research ventures are not necessarily illegal under the antitrust laws, they can be. The legality of the arrangement generally turns on all of the circumstances surrounding it, such as the characteristics of the industry, the identity of the participants and their relationship to one another, the scope and duration of the joint research project, whether the joint venture avoids unnecessary and wasteful duplication of effort, the ability of the participants to conduct similar research individually, access by nonparticipants to the benefits of the venture, and the existence of any collateral restraints and activities. It is important to note that the purpose of antitrust law in this area is to foster innovation through competition. Joint research ventures that retard innovation are those that are likely to raise antitrust problems.

We have monitored S. 1250 since its introduction in the Senate and have always understood that the antitrust laws would be fully applicable to activities of the Centers. So that this understanding would be expressly clarified in the bill, Ky P. Ewing, Jr. suggested during his Senate testimony last year that "continued applicability of the antitrust laws should be made explicit in any legislation along these lines." See Hearings, supra at 153, 157. When the bill passed the Senate on May 28, 1980, present section 6(f) was added, requiring the Director or NSF, prior to the commitment of substantial funds to a Center, to request from the Attorney General "an opinion whether the joint research activities of the Center would be in violation of any of the antitrust laws." While this express recognition of the applicability of antitrust laws to research Centers is a welcome addition, the Department supports amending section 6(f) so that it would read:

> "(f) Additional Consideration -- The Secretary may request the Attorney General's opinion whether the proposed joint research activities of a Center would violate any of the antitrust laws. The Attorney General shall advise the Secretary of his determination and the reasons for it within 120 days after receipt of such request. However, the establishment of a Center,

> the rendering of an opinion by the Attorney General, or any other activity undertaken or approved under this Act, shall not convey to any person, association, corporation or other business organization immunity from civil or criminal liability, or create defenses to actions under any antitrust law."

The antitrust savings clause added by the last sentence of this amended version of section 6(f) would further clarify the fact that activities of the Center are in no way protected from normal application of the antitrust laws. 1/

B. Objection To Patent Provisions of S. 1250

Section 6(e) of S. 1250 contains a number of provisions regarding the allocation of any patent rights emanating from research and development at the Centers. These provisions, however, are in a number of ways significantly different from the provisions of H.R. 6933, the Administration's omnibus patent bill which we support and which is now scheduled for mark up on July 22-23 by the House Subcommittee on Courts, Civil Liberties and the Administration of Justice. The Department objects not only to these individual differences but, even more importantly, to the fact that S. 1250 is inconsistent with the attempt in H.R. 6933 to create a uniform policy for all government agencies with respect to the allocation of patent rights in federally funded inventions.

It has long been recognized that a uniform government patent policy is needed to eliminate the confusion inherent in the vast array of statutes and regulatory authorities presently directing agencies to allocate patent rights in inventions made by government contractors. It has also been recognized that such legislation should seek to achieve four distinct goals: (1) permit the government to protect adequately the public's equitable interest in inventions resulting from federal funding; (2) encourage contractors to exert their best efforts as well as encourage their widest possible participation in government sponsored research and development programs; (3) assure that inventions resulting from government funding will be fully disclosed to the responsible agency; and (4) induce the commercialization, under the most competitive circumstances possible, of any commercially valuable inventions resulting from federal funding.

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1/ Our amended version of section 6(f) would also make permissive the mandatory requirement of seeking advice from the Attorney General. This change would eliminate the need to seek such advice when the activities of a Center are clearly legal.

Because these goals tend to conflict in some ways, there has not been previously any broad consensus as to the appropriate manner in which to allocate rights in government funded research. In fact, controversy in this regard has existed for over thirty years. Presently, the goals are being accommodated in a number of different ways by different government agencies and no comprehensive legislation uniformly controls the disposition of invention rights for all those agencies. Indeed, some agencies that are subject to more than one statutory or regulatory scheme have adopted patent rights allocation policies that vary according to the particular research and development program in which the contractor is participating.

This lack of uniformity has created confusion among the contractors who perform research and development activities for several agencies or programs. As President Carter observed with respect to federally funded invention rights in his Industrial Innovation Message to the Congress of October 31, 1979: "This confusion has seriously inhibited the use of those patents in industry." The Administration's bill, H.R. 6933, which embodies the President's proposal for a uniform government patent allocation system, would replace the numerous conflicting patent allocation policies presently in force with a single, government patent policy. S. 1250, however, would undermine that proposal by including provisions which differ from those of H.R. 6933 with respect to one type of government R&D contract. Rather than see yet another patent policy passed by Congress, applicable to only a specific type of contract entered into by two government agencies, we suggest that S. 1250 not contain patent provisions and that the existing patent policy of these two agencies apply until a uniform government patent policy, such as that embodied in H.R. 6933, becomes law.

Apart from undercutting the objective of a uniform government patent policy, S. 1250 does not accommodate as sufficiently as does H.R. 6933 the four goals, mentioned above, which proper government patent policy legislation should achieve. The Administration's bill generally provides for the government -- not the contractor -- to take title in inventions resulting from federal funding when the contractor is a big business. 2/ Such contractors receive exclusive licenses in fields of use that they specify and in which they agree to commercialize the inventions, so long as the receipt of these rights is not inconsistent with the public's interest in those inventions. The government retains the right to license the invention or otherwise make it available to the public

---

2/ Title goes to contractors who are small businesses or non-profit institutions.

in fields of use not specified by the contractor. S. 1250, on the other hand, gives each Center (i.e. the contractor) the option of acquiring title, even when the Center involves participation by a big business and participants in the Center have agreed to give title to that big business. The acquisition of title in effect means that the Center has exclusive rights in all fields of use, whether or not all those fields are commercialized by the Center. The government has no authority to license the invention in the fields of use that are of no interest to the Center or its participants.

In our view, the granting of title to the contractor in S. 1250 represents a departure from previous legislation concerning the allocation of patent rights in federally funded inventions. Congress has addressed this issue on numerous occasions but, we believe, has never enacted a statute that would normally provide contractors with title to such inventions. Most statutes provide either that title will be retained by the government or that the federally funded research will be made available to the public. While statutes permit the government to waive title to the contractor, they do so only when certain specified public interest criteria are met.

H.R. 6933 also departs from previously enacted legislation by allowing contractors normally to receive exclusive rights (i.e., exclusive licenses for big businesses and title for small businesses). It does so in recognition of the fact that contractors often need exclusive rights to justify the expenditures necessary to commercialize an invention. Unlike S. 1250, however, H.R. 6933 limits the rights of big business contractors to designated fields of use. Moreover, H.R. 6933 attempts to grant exclusive rights only within a framework that protects the public's equitable interest in the invention. Essential to this framework are two provisions in H.R. 6933 which seek to prevent contractors who receive federally funded inventions from achieving anticompetitive results through such receipt. Under H.R. 6933's "second-look" provision, the government is provided with the opportunity to prevent a big business contractor's initial acquisition of an exclusive license in the invention when such an acquisition would violate the antitrust laws if the receipt by the contractor of such a license were deemed an acquisition of assets of another corporation. Under H.R. 6933's "march-in" provision, the government has the right, after any contractor has obtained exclusive rights, to modify those rights if the acquisition of them would have violated the antitrust laws. Both the "second-look" and "march-in" standards incorporate the traditional competition standards of Section 7 of the Clayton Act. As such, the government may exercise its "march-in" and "second look" rights when the contractor's acquisition of exclusive rights may tend substantially to lessen competition, even if such a lessening of competition has not yet occurred.

S. 1250 provides the public with significantly less competitive protection than do the "second-look" and "march-in" provisions of H.R. 6933. S. 1250 includes no "second-look" provision. Therefore, the government will have no opportunity under S. 1250 to evaluate the competitive impact of a big business contractor's initial acquisition of exclusive rights in an invention, at the time of that acquisition. While S. 1250 contains an antitrust "march-in" provision, it is less desirable than the one in H.R. 6933. Under S. 1250, the government may exercise its "march-in" rights only when "the granting of exclusive rights in the invention has tended substantially to lessen competition or to result in undue market concentration." Therefore, unlike H.R. 6933, S. 1250 does not allow the government to "march-in" until the competitive harm already has occurred. Moreover, the "march-in" rights of S. 1250 are available only against contractors and licensees, not assignees. As a result, an assignment of title in an invention by the Center would nullify the "march-in" rights.

The Office of Management and Budget has advised that there is no objection to the submission of this letter from the standpoint of the Administration's program.

Sincerely,

(Signed) Alan A. Parker

Alan A. Parker
Assistant Attorney General

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