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STATE TECHNICAL SERVICES ACT OF 1965

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HEARINGS BEFORE THE SUBCOMMITTEE ON COMMERCE AND FINANCE OF THE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE HOUSE OF REPRESENTATIVES EIGHTY-NINTH CONGRESS

FIRST SESSION

ON

H.R. 3420

A BILL TO PROMOTE ECONOMIC GROWTH BY SUPPORTING
STATE AND REGIONAL CENTERS TO PLACE THE FINDINGS
OF SCIENCE USEFULLY IN THE HANDS OF AMERICAN
ENTERPRISE
(AND IDENTICAL BILLS)

JUNE 1, 2, AND 3, 1965

Serial No. 89-15

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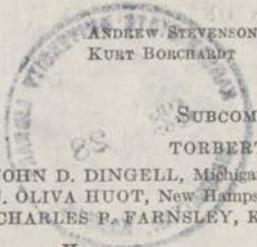
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Serial No. 89-12



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STATE TECHNICAL SERVICES ACT OF 1965

TUESDAY, JUNE 1, 1965

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON COMMERCE AND FINANCE
OF THE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m., in room 2123, Rayburn House Office Building, the Honorable Torbert H. Macdonald (chairman of the subcommittee) presiding.

Mr. MACDONALD. The hearing will come to order.

The subcommittee meets this morning to receive testimony on H.R. 3420, a bill which would permit the Federal Government to participate with State governments, universities, and industries within particular States in stimulating the industrial and economic growth of States and regions in the Nation through the application of science and technology. This proposed legislation resulted from President Johnson's direction to the Department of Commerce to explore new ways to speed the development and dissemination of new technology. In his Economic Report of January 1964, the President states:

The Federal Government provides major support for the research and development which underlie our striking technological advances. In the past, much of our research and development has been connected with national defense. Now, as military outlays level off we face—

A challenge to apply the Nation's growing scientific and engineering resources to new socially profitable uses; and

An opportunity to accelerate the technological progress of our civilian industries.

The Federal Government should join with private business and our universities in speeding the development and spread of new technology. I have directed the Department of Commerce to explore new ways to accomplish this.

What I have said in substance has been transmitted to us in correspondence from the Department of Commerce.

This morning we will have the pleasure of hearing from Secretary of Commerce John T. Connor, who is accompanied by J. Herbert Hollomon, Assistant Secretary for Science and Technology.

I believe that it is generally recognized that the bill does not get down to specifics. We hope to, and expect to, make a record which will establish for all of us the pros and cons of legislation of this kind. This is a significant and far-reaching subject.

At this time I will call to the witness stand a friend and colleague of mine from the great Commonwealth of Massachusetts, the Honorable Silvio O. Conte, who has introduced a bill H.R. 7708, which is identical to the bill introduced by the distinguished and able chairman of our committee, H.R. 3420, and also to bills H.R. 3960 filed by the gentleman from California, Mr. Roosevelt; H.R. 4235 by Mr. Cohelan of California; H.R. 4810 by the gentleman from Georgia, Mr. Stephens;

H.R. 4879, by the gentleman from New Hampshire, our colleague on the subcommittee, Mr. Huot; H.R. 4963, filed by the gentleman from California, Mr. Miller; H.R. 6026 filed by the gentleman from California, Mr. Corman; H.R. 7335 filed by Mr. McVicker, of Colorado; H.R. 7339 filed by the gentleman from Pennsylvania, Mr. Fulton; H.R. 7474 filed by the gentleman from Maryland, Mr. Mathias; H.R. 7498, filed by the gentleman from Florida, Mr. Pepper; H.R. 7501, filed by the gentleman from Iowa, Mr. Schmidhauser; and H.R. 8049 filed by the gentleman from California, Mr. Brown.

(H.R. 3420, and reports thereon, follows:)

[H.R. 3420, 89th Cong., 1st sess.]

A BILL To promote economic growth by supporting State and regional centers to place the findings of science usefully in the hands of American enterprise

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

DECLARATION OF PURPOSE

SECTION 1. That Congress finds that wider diffusion and more effective application of science and technology in industry are essential to the growth of the economy, to higher levels of employment and to the competitive position of United States products in world markets. The Congress also finds that the benefits of federally financed research, as well as other research, must be placed more effectively in the hands of American business and enterprise. The Congress further finds that the several States through cooperation with universities, communities, and industries can contribute significantly to these purposes by providing technical services designed to encourage a more effective application of science and technology to both new and established industries. The Congress, therefore, declares that the purpose of this Act is to provide a national program of incentives and support for the several States individually and in cooperation with each other in their establishing and maintaining State and regional technical service programs designed to achieve these ends.

DEFINITIONS

SEC. 2. For the purposes of this Act—

(a) "Technical services" means activities or programs designed to enable businesses and industries to acquire and use scientific and engineering information more effectively through such means as—

(1) analyzing problems of regions and industries to determine new opportunities for applying technology;

(2) preparing and disseminating technical reports, abstracts, computer tapes, microfilm, reviews and similar scientific or engineering information, including the establishment of State or regional technical information centers for this purpose;

(3) providing a reference service to identify sources of engineering and other scientific expertise; and

(4) sponsoring industrial workshops, seminars, training programs, extension courses, demonstrations and field visits designed to encourage the more effective application of scientific and engineering information.

(b) "Designated institution" means the institution or agency in each participating State, which has been designated as administrator of the program for such State under section 3 of this Act.

(c) "Qualified institution" means (1) an institution of higher learning with a program leading to degrees in engineering or business administration which is accredited by a nationally recognized accrediting agency or association to be listed by the United States Commissioner of Education, or such an institution which is listed separately after evaluation by the United States Commissioner of Education pursuant to this subsection; or (2) a State agency or a private, non-profit institution which meets criteria of competence established by the Secretary of Commerce and published in the Federal Register. For the purpose of this Act, the United States Commissioner of Education shall publish a list of nationally recognized accrediting agencies or associations which he determines to be reliable

authority as to the quality of engineering or business education or training offered. When the Commissioner determines that there is no nationally recognized accrediting agency or association qualified to accredit such programs, he shall publish a list of institutions he finds qualified after prior evaluation by an advisory committee, composed of persons he determines to be specially qualified to evaluate the training provided under such programs.

(d) "Participating institution" means each qualified institution in a State, which participates in the administration or execution of the State technical services program as provided by this Act.

(e) "Secretary" means the Secretary of Commerce or the official to whom the Secretary has delegated all or part of the authority in this Act.

(f) "State" means one of the States of the United States, the District of Columbia, the Commonwealth of Puerto Rico, or the Virgin Islands.

PLANS AND PROGRAMS

SEC. 3. Any State which wishes to receive Federal payments under this Act in support of its existing or planned technical services program shall designate under appropriate State laws and regulations, an institution or agency to administer and coordinate that program and to prepare and submit plans and programs to the Secretary of Commerce for approval under this Act. If the institution or agency designated by each State is not a State university or land-grant college entitled to benefits under the Act approved July 2, 1862, or the Act of August 30, 1890, and Acts amendatory and supplementary thereto (1 U.S.C. 301-329), the Governor or other competent State authority shall furnish the Secretary a written statement of his reasons for designating such other institution or agency.

SEC. 4. The designated institution shall prepare and submit to the Secretary in accordance with such regulations as he may publish—

(a) At the beginning of each five-year period, a five-year plan which may be revised annually and which shall (1) outline the technological and economic conditions of the State taking into account its region, its industry, and its industrial potential and identify the major regional and industrial problems; (2) identify the general approaches and methods to be used in the solution of these problems and outline the means for measuring the impact of such assistance on the State or regional economy; and (3) explain the methods to be used in administering and coordinating the program.

(b) An annual technical services program which shall (1) identify specific methods, which may include contracts, for accomplishing particular goals and outline the likely impact of these methods in terms of the five-year plan; (2) contain a detailed budget, together with procedures for adequate fiscal control, fund accounting, and auditing, to assure proper disbursement for funds paid to the State under this Act; and (3) indicate the specific responsibilities assigned to each participating institution in the State.

SEC. 5. The Secretary shall not accept a five-year plan for review and approval under this Act unless the Governor of the State or his designee determines and certifies that the plan is consistent with State policies and objectives; and the Secretary shall not accept an annual technical services program for review and approval under this Act unless the designated institution has, as certified thereto by the Governor or his designee—

(a) invited all qualified institutions in the State to submit proposals for providing technical services under the Act;

(b) coordinated its programs with other States and with other publicly supported activities within the State, as appropriate;

(c) established adequate rules to insure that no officer or employee of the State, the designated institution or any participating institution, shall receive compensation for technical services for which funds are provided under this Act from sources other than his employer and shall not otherwise maintain any private interest in conflict with his public responsibility;

(d) determined that matching funds will be available from State or non-Federal sources;

(e) determined that such technical services program does not provide a service performed as practicably by private technical services, professional consultants or private institutions;

(f) planned no services specially related to a particular firm or company except insofar as the services are of general concern to the community, State or region;

(g) provided for making public all reports prepared in the course of furnishing technical services supported under this Act or for making them available at cost to any person on request.

APPROVAL BY SECRETARY OF COMMERCE

SEC. 6. The Secretary shall review each five-year plan and each annual program submitted by the designated institution under section 4, or by the regional or interstate institution under section 7, and shall approve only those which (1) bear the certification required by the Governor or his designee under section 5; (2) comply with regulations and meet criteria that the Secretary shall promulgate and publish in the Federal Register; and (3) otherwise accomplish the purposes of this Act.

REGIONAL OR INTERSTATE PROGRAMS

SEC. 7. Two or more States may cooperate in administering and coordinating their plans and programs supported under this Act, in which event all or part of the sums authorized and payable under section 11 to all of the cooperating States may be paid to the institutions or persons authorized to receive them under the terms of the agreement between the cooperating States. When the cooperative agreement designates a regional or interstate institution to act on behalf of all of the cooperating States, it shall submit to the Secretary for review and approval under section 6 a regional or interstate five-year plan and annual regional or interstate technical services program which, as nearly as practicable, shall meet the requirements of section 4 and section 5.

SEC. 8. Notwithstanding the provisions of section 11, the Secretary is authorized to increase by 10 per centum the amount which he approves for any regional or interstate technical services program submitted under section 7. Such additional amount may be paid without requiring matching funds from State or non-Federal sources.

SEC. 9. The consent of the Congress is given to any two or more States to enter into agreements or compacts, not in conflict with any law of the United States, for cooperative efforts and mutual assistance in establishing regional or interstate institutions under section 7 for accomplishing the purposes of this Act.

ADVISORY COUNCIL

SEC. 10. Each designated institution and each regional or interstate institution shall establish an advisory council for technical services, the members of which shall represent broad community interests and shall be qualified to evaluate programs submitted under section 4. The advisory council shall review each annual program, evaluate its relation to the purposes of this Act, and report its findings to the designated institution and the Governor or his designee. Each report of the advisory council shall be available to the Secretary on request.

ADMINISTRATION AND PAYMENTS

SEC. 11. There is authorized to be appropriated such amounts as may be needed to carry out the purposes set forth in this section.

(a) From these amounts, the Secretary is authorized to make an annual payment to each designated institution, regional or interstate institution, or person authorized to receive payments in support of each approved technical services program. Maximum amounts which may be paid to the States under this subsection shall be fixed in accordance with regulations which the Secretary shall promulgate and publish in the Federal Register from time to time, considering (1) population according to the last decennial census; (2) industrial and economic development and productive efficiency; and (3) technical resources.

(b) The Secretary may reserve an amount equal to not more than 20 per centum of the total amount appropriated each year under this section and is authorized to make payments to any designated or participating institution for technical services programs which he determines have special merit or to any qualified institution for additional programs which he determines are necessary to accomplish the purposes of this Act, under criteria and regulations that he shall promulgate and publish in the Federal Register.

(c) An amount equal to not more than 5 per centum of the total amount appropriated each year under this section shall be available to the Secretary for the direct expenses of administering this Act.

(d) No amount paid under subsection (a) shall exceed one-half of the cost of the approved annual technical services program of the State, and for each dollar paid under subsections (a) and (b) there shall be available for expenditure on each approved program at least \$1 from State or non-Federal sources: *Provided*, That the Secretary may pay an amount not to exceed \$25,000 a year for each

of the first three fiscal years to each designated institution to assist in the preparation of the first five-year plan and the initial annual technical services programs, without regard to any requirement of this section.

(e) At the end of each fiscal year, all remaining amounts which are appropriated for payments to the States under subsection (a) and which have not been obligated for payments to the States at that time, shall be available to the Secretary for payments under subsection (b), until expended.

SEC. 12. The Secretary is authorized and directed to aid the States and regions in carrying out their technical services programs by providing reference services which a State or region may use to obtain scientific, technical, and engineering information from sources outside the State or region, for the purposes of this Act. There is authorized to be appropriated each fiscal year such amount as may be necessary to provide the services authorized in this section.

SEC. 13. The Secretary is authorized to establish such policies, standards, criteria, and procedures and to prescribe such rules and regulations as he may deem necessary or appropriate for the administration of this Act.

LIMITATIONS

SEC. 14. (a) Nothing contained in this Act shall be construed as authorizing a department, agency, officer, or employee of the United States to exercise any direction, supervision, or control over, or impose any requirements or conditions with respect to the personnel, curriculum, methods of instructions, or administration of any educational institution.

(b) Nothing contained in this Act shall be deemed to affect the functions or responsibilities under law of any other department or agency of the United States.

EVALUATION

SEC. 15. Within five years from the date of the approval of this Act, and prior to the end of each five-year period thereafter, the Secretary shall appoint a public committee, none of the members of which shall have been directly concerned with the preparation of plans, administration of programs or participation in programs under this Act. The committee shall evaluate the significance and impact of the program under this Act and make recommendations concerning the program. A report shall be transmitted to the Secretary within sixty days after the end of each five-year period.

ANNUAL REPORT

SEC. 16. Each designated institution or regional or interstate institution shall make an annual report to the Secretary on or before the first day of September of each year on the work accomplished under the technical services program and the status of current services, together with a detailed statement of the amounts received under any of the provisions of this Act during the preceding fiscal year, and of their disbursement.

TERMINATION

SEC. 17. Whenever the Secretary, after reasonable notice and opportunity for hearing to any institution receiving funds under this Act finds that—

(a) the institution is not complying substantially with the provisions of this Act, with the regulations promulgated by the Secretary, or with the approved annual technical services program; or

(b) any funds paid to the institution under the provisions of this Act have been lost, misapplied, or otherwise diverted from the purposes for which they were paid or furnished.

the Secretary shall notify such institution that no further payments will be made under the provisions of this Act until he is satisfied that there is substantial compliance or the diversion has been corrected or, if compliance or correction is impossible, until such institution repays or arranges for the repayment of Federal funds which have been diverted or improperly expended.

SEC. 18. Upon notice by the Secretary to any institution that no further payments will be made pending substantial compliance correction or repayment under section 17, any funds which may have been paid to such institution under this Act and which are not expended by the institution on the date of such notice, shall be repaid to the Secretary and be deposited to the account of the appropriations from which they originally were paid.

SHORT TITLE

SEC. 19. This Act may be cited as the "State Technical Services Act of 1965".

GENERAL COUNSEL OF THE DEPARTMENT OF COMMERCE,
Washington, D.C., March 15, 1965.

HON. OREN HARRIS,
Chairman, Committee on Interstate and Foreign Commerce,
House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: This is in reply to your request for the views of this Department concerning H.R. 3420, a bill to promote economic growth by supporting State and regional centers to place the findings of science usefully in the hands of American enterprise.

H.R. 3420 is for the same purpose as the draft of legislation submitted to the Congress by this Department on January 15, 1965. The Department urges early enactment of H.R. 3420 for the reasons set forth in the statement of purpose and need submitted to the Congress with our draft bill. A copy of the statement of purpose and need is attached for your convenient reference.

We have been advised by the Bureau of the Budget that enactment of this legislation would be in accord with the program of the President.

Sincerely,

ROBERT E. GILES.

STATEMENT OF PURPOSE AND NEED ON PROPOSED STATE TECHNICAL SERVICES ACT OF 1965

This proposed legislation is in response to President Johnson's direction to the Department of Commerce to explore new ways to speed the development and dissemination of new technology. In his Economic Report of January 1964, the President stated:

"The Federal Government provides major support for the research and development which underlie our striking technological advances. In the past, much of our research and development has been connected with national defense. Now, as military outlays level off we face—

"A challenge to apply the Nation's growing scientific and engineering resources to new socially profitable uses;

"An opportunity to accelerate the technological progress of our civilian industries.

"The Federal Government should join with private business and our universities in speeding the development and spread of new technology. I have directed the Department of Commerce to explore new ways to accomplish this."

GENERAL DESCRIPTION

The proposed State Technical Services Act of 1965 would enable the Federal Government to make grants to States in support of programs to achieve more effective commercial use of the findings of science and technology. This would be done through technical services programs, planned locally, designed specifically to place these findings into the hands of local businesses and enterprises.

To qualify for Federal matching funds, a State would designate an institution or agency responsible for preparing and administering technical services programs within the State. A regional institution could be designated where two or more States wish to join in a cooperative program (10 percent more Federal support would be available for regional institutions). State and regional programs would be formulated and put into effect with local or regional initiative and responsibility. All qualified institutions in the State could participate.

NEED FOR THE PROGRAM

A close examination of the modern American economy reveals a number of recurring themes—all of them related in some degree to the importance of having effective mechanisms for introducing the results of science and technology into commercial use. For example:

The competition we face in both domestic and world markets is increasingly based on a high level of technology, not solely on lower labor costs.

The most successful competitors, whether at an international level, industrywide, or among individual companies, are those who have learned to use new technology effectively.

The cost of new technology, in the form of technical manpower and equipment, has been rapidly rising.

Opportunities to participate in benefits of technology have not been equally available in the various regions of the United States.

Substantial expenditures for specialized research and development in support of national defense and space missions have not met the full range of industrial needs for technology.

The vast increase in the Nation's total research and development effort have not eradicated long-term unemployment and economic decline in many parts of the country.

Technology cannot be effectively diffused merely by giving information to a potential user. There must be means for active interchange between those using and those furnishing information.

There are many factors involved in complete solutions to the broad problems outlined above. Common to all of them, however, is the need for institutions and mechanisms at the local level, specifically designed to bridge the gap between the most advanced technology, wherever it exists, and the industrial practices of the local region.

OBJECTIVES

Through this program and with the cooperation of universities, communities and industries, three objectives will be served: (1) strengthening the Nation's economy by upgrading industries through the utilization of advanced technology, thereby generally expanding the industrial base; (2) increasing employment by facilitating industrial's use of technology and the manufacturing of new products which result; and (3) enhancing the competitive position of U.S. products in world markets.

The proposal is based on the premise of strong local support and local initiative. The proposal is designed to stimulate local economic programs, utilizing local specialists and applying local resources with Federal matching support and encouragement. Distinct contributions to the economic vitality of our Nation will be made by those who are closest to the problems which the program is designed to meet.

HOW THE PROGRAM WOULD OPERATE

A State wishing to participate in the program would designate an institution (generally a State university or land-grant college) to administer and coordinate the State's technical services program.

The designated institution would prepare a 5-year plan, outlining the technological and economic situation in the State, the major regional and industrial problems, and the means to be used in assisting in their solution.

The designated institution would also prepare an annual technical services program, covering the objectives for the first year, the budget, and the responsibilities assigned to each qualified institution participating in the program. Up to \$25,000 per year for each of the first 3 years may be paid to the designated institution to assist in preparing the first 5-year plan and the initial annual programs.

An advisory council would be established by the designated institution to evaluate and report on the 5-year plan and the annual technical service program.

The 5-year plan and the annual program would be submitted to the Secretary of Commerce. Federal matching funds would be made available to the designated institution to support those programs found by the Secretary to meet legal requirements and to further the purposes of the act. The maximum annual payment in support of any State program will be limited by a formula to be established by the Secretary, taking into consideration three criteria: (1) Population according to the last census; (2) industrial and economic development and productive efficiency; and (3) technical resources. Supplementary matching grants, totaling up to 20 percent of the amount appropriated each year, may also be made to support programs which the Secretary determines have special merit. These provisions are designed to assure that the program's benefits will be widely diffused throughout the Nation while at the same time reserving sufficient discretion to the Secretary to assure that funds are granted only in support of adequately developed programs which will in fact advance the purposes of the act.

The formula to be established by the Secretary will be based on objective considerations such as the proportion of working population gainfully employed, the ratio of assets of individual establishments to employees, urban population, industrial population, numbers of scientists and engineers, and the physical research facilities used for industrial purposes. The formula will be weighted to provide funds to States and regions where industrial development has lagged behind its potential and where technical resources are weak. The population criteria will be applied in a manner which will permit even the smallest States to participate in a meaningful program.

New plans are required at 5-year intervals, although they are to be revised if necessary. Annual technical services programs must be submitted to the Secretary of Commerce each year in order to qualify for annual matching funds. In administering the program and approving plans, the Secretary would consult with other agencies of the Federal Government as appropriate. An annual report is required at the conclusion of each year.

Once in operation, there is a wide variety of technical services which might be offered by the various institutions participating in the program within a particular State. For example, a technology diffusion program oriented to the needs and problems of a specific industry dominant in one State or region might offer workshops, seminars, and demonstrations in order to bring existing technology to local entrepreneurs for use in plants within the region. A technology dissemination and referral center could offer two types of services: (1) technical reports abstracts, bibliographies, reviews, microfilm, computer tapes, and the like; and (2) referral to sources of scientific and engineering expertise in the fields of interest to the local industry. Such a center would be in continuous interaction with local business and industry, so that its services will be pertinent to the local economy. These examples by no means exhaust the list of possible technical services that might be offered in any State program. The range of services can be as wide as the range of industrial and technological interests in this country, and, within the bounds of the act, is only limited by the imagination and initiative of the persons who develop the State program.

COST

The cost to the Federal Government of the proposed program is expected to be in the range of \$5 to \$10 million for the first year and such amounts as may be necessary for effective future programs which the States justify to the Secretary of Commerce.

All funds made available to States for technical services, except regional incentives, would be matched at least equally by non-Federal funds. Direct Federal expenditures would be limited to expenditures for administration, to be held to less than 5 percent of the cost of the program, and for reference services to aid the States and regions in collecting and processing technical information for dissemination to industry under the act.

These funds will be an investment in promoting the economic growth and widespread industrial development of the entire Nation.

COMPTROLLER GENERAL OF THE UNITED STATES,
Washington, D.C., March 15, 1965.

B-156076.

HON. OREN HARRIS,
*Chairman, Committee on Interstate and Foreign Commerce,
House of Representatives.*

DEAR MR. CHAIRMAN: By letter dated February 16, 1965, you requested our report on H.R. 3420. The stated purpose of this measure is to promote economic growth by supporting State and regional centers to place the findings of science usefully in the hands of American enterprise.

While we have no special information that would assist the committee in its consideration of the merits of H.R. 3420, we offer the following comments on certain aspects of the measure:

Inasmuch as the grants made to the institutions described in the bill would involve the expenditure of appropriated funds, it is our understanding that these expenditures would be subject to audit and review by this office, with such reports to the Congress as may be deemed necessary under the provisions of the Budget and Accounting Act, 1921 (31 U.S.C. 53) and the Accounting and Auditing Act of 1950 (31 U.S.C. 67). We note, however, that the bill would not expressly grant the Secretary of Commerce or the Comptroller General the right to examine pertinent books, records, and documents of the institutions and agencies receiving Federal grants under the provisions of the bill. We believe that access to such records is necessary for the adequate administration and audit of a grant program, and we therefore suggest that the bill be amended by including a section substantially as follows:

"Each recipient of a grant under this act shall keep such records as the Secretary shall prescribe, including records which fully disclose the amount and the dis-

position of such grant, the total cost of the related approved program, the amount and nature of the cost of the program supplied by other sources, and such other records as will facilitate an effective audit.

"The Secretary and the Comptroller General of the United States, or any of their duly authorized representatives, shall have access to any books, documents, papers, and records of the recipient that are pertinent to amounts paid under this act."

Section 5(g) of H.R. 3420 would require that all reports prepared in the course of furnishing technical services supported under the bill be made public or be made available at cost to any person on request. It is not clear whether, for the purposes of the bill, the cost of the reports is intended to include only the costs of printing and distribution or the full cost of preparing the reports, including research, administrative, and other costs.

Section 11(c) provides that up to 5 percent of the total amount appropriated each year shall be available for direct expenses of administration. We believe that funds for administrative expenses should be provided by the Congress each year in a specified amount on the basis of the proposed program for such fiscal year.

We have no further comments to make concerning H.R. 3420.

Sincerely yours,

JOSEPH CAMPBELL,
Comptroller General of the United States.

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D.C., May 28, 1965.

HON. OREN HARRIS,
*Chairman, Committee on Interstate and Foreign Commerce,
House of Representatives, Washington D.C.*

DEAR MR. CHAIRMAN: This is in response to your request for the views of the Bureau of the Budget on H.R. 3420, a bill to promote economic growth by supporting State and regional centers to place the findings of science usefully in the hands of American enterprise.

You are advised that enactment of H.R. 3420 would be in accord with the President's program.

Sincerely yours,

PHILLIP S. HUGHES,
Assistant Director for Legislative Reference.

Mr. MACDONALD. At this time I recognize the gentleman from Massachusetts, Mr. Conte.

STATEMENT OF HON. SILVIO O. CONTE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MASSACHUSETTS

Mr. CONTE. Mr. Chairman, members of the committee, it is certainly a pleasure to appear before this subcommittee chaired by my good friend and able Congressman colleague from Massachusetts, Torby Macdonald. Mr. Chairman, in order to save time I will submit my statement and also a letter from Dr. Lederle, president of the University of Massachusetts.

Mr. MACDONALD. Without objection, it is so ordered.
(The documents referred to follow:)

REMARKS OF HON. SILVIO O. CONTE

Mr. Chairman, members of the subcommittee, I wish to thank you for the opportunity you have afforded me this morning to testify in behalf of my bill, H.R. 7708, which I introduced on April 28 of this year. My bill is identical to the one introduced by our colleague from Arkansas, Congressman Harris.

It was a pleasure to introduce a bill which would promote the economic growth of not only my district—the First Congressional District, but also of my State,

Massachusetts; and the country. The bill would accomplish this by providing federally supported State and regional centers under a State Technical Services Act. These centers established at a local university, a State agency, or a private nonprofit institution would be required to meet certain criteria of competence instituted by the Secretary of Commerce and published in the Federal Register.

In many respects this bill is similar in concept to the Agricultural Extension Act. Under that act, farmers are able to go to State institutions in order to find solutions to their problems. Under the provisions of this act, H.R. 7708, businessmen would now be able to receive help at State institutions or regional institutions to meet the demands of an ever-increasing technology.

These centers would place the findings of science and technology in the hands of businessmen. I am particularly pleased that it would, most likely, place such information in the hands of small businessmen. They are the ones who are most often unable to meet the pressing problems which they face, because of lack of funds, or simply because they do not know where to turn.

It is axiomatic that wider diffusion and more effective application of science and technology in industry and business is essential to the growth of the American economy. It is necessary if we are to maintain and increase present levels of employment. It is necessary if we are to successfully compete for world markets, while maintaining a high level of income. And the time has come, gentlemen, when it is necessary that the benefits of federally financed research, as well as research financed in other ways, be placed in the hands of American businessmen and enterprises. To insure the most effective operation of such a plan as proposed in my bill, it is imperative that it be one which is developed on a State or regional level. This has also been proposed in my bill. The States, through cooperation with their universities, their communities, and their industries can best determine the needs of their industries and how the modern developments in science and technology can most effectively be applied to meet the needs of new and old industries and of large and small industries.

Gentlemen, in the Commonwealth of Massachusetts alone, there are approximately 8,800 small businesses. These are the people who would benefit the most from the workings of this act. These are the people who are too small to maintain their own staffs of technicians and research specialists. Under the provisions of my act they would be able to call upon the assistance of the State or regional institutions for help they now cannot afford because of the size of their operations.

However, I have personally observed the death of many firms in my district and in my State. A textile firm, successful for 50 years, was forced to close its doors. A papermill was also forced to shut down its operations. I believe that if technical help had been available to these firms of the nature envisioned under the provisions of the bill now before you, the story might have been different. The loss to the State and to the community and the families comprising them would have been avoided. I am certain that you have also seen similar closings and similar losses suffered in your districts and in your States.

I, therefore, respectfully urge that the members of this subcommittee report favorably to the full committee on the provisions of my bill. I do not believe that we should delay in providing the type of help which would be made available under the provisions of my bill to those who need it. I am certain that in the years to come this bill shall be looked upon as a major boon to industry and business.

Thank you, gentlemen, in allowing me to express my views on this matter this morning.

THE COMMONWEALTH OF MASSACHUSETTS,
UNIVERSITY OF MASSACHUSETTS,
Amherst, May 27, 1965.

HON. SILVIO O. CONTE,
*House Office Building,
Washington, D.C.*

DEAR REPRESENTATIVE CONTE: The State Technical Services Act of 1965 (S. 949 and H.R. 3420) proposed a most significant potential contribution to our urban, industrial society. The University of Massachusetts strongly endorses the bills and hopes that you will support them for the future welfare and prosperity of the Commonwealth.

Briefly, as you know, the proposed act would grant matching funds to make more readily available the latest technologies and discoveries for the benefit of local businesses and industries. Under such an act, the university would work

with other accredited engineering and business schools to form plans where scientific and technological information may be put into the hands of private industry and business in order for them to operate more efficiently.

Through such means, our institutions of higher education can aid in the improvement of the economy of Massachusetts, strengthening employment, growth and prosperity. In the two areas of improving present manufacturing and in new product development, the proposed act can aid our commercial enterprises in a material manner.

Advanced technology makes manufacturing and distribution processes continuously subject to obsolescence. The advent of the stainless steel razor blade is an example wherein a Massachusetts firm, the Gillette Co., had to respond quickly in order to meet the competition. Under the proposed act, our scientists and engineers might assist in providing greater leadtime for our industries in moving to meet such competition.

New product development has become an important factor in economic vitality. Some industries report that from 30 to 50 percent of their current production is in products that were not on the market 20 years ago. Massachusetts industries must be assisted in maintaining their progress in this dynamic area of competition.

Other States have, on a State-supported basis, modest programs similar to that envisaged in this act. New Hampshire, for example, has 10 full-time staff in their engineering experiment station. Georgia has 50 people aiding State industries and has just opened its fifth branch office to provide this type of technical services. Iowa's center has 10 full-time people, and North Carolina has a \$200,000 budget for such purposes.

There are 8,900 industries in Massachusetts, of which 8,800 have less than 1,000 employees and are, therefore, too small to maintain fully their own technical and research service staffs. These bills will provide an impetus to the general court to cooperatively support a program of communication and assistance between campuses and commercial enterprise so that competent technical assistance can be made readily available.

The University of Massachusetts, recognizing the problem, has already committed some funds to the purpose of aiding Massachusetts industries. But this level of assistance must be substantially increased if our service and contribution to business in the State is to have a real impact and widespread constructive result. We would hope for your active support and favorable vote on this legislation.

Sincerely yours,

JOHN W. LEDERLE, *President.*

Mr. HARRIS. Mr. Chairman, I would like to join in welcoming our colleague, Mr. Conte, to these hearings this morning, and to thank him for his interest in this important and visionary program, which also has practical realities included in it. I am very glad to welcome him as one of the sponsors of the supporting legislation.

Mr. CONTE. Thank you, Mr. Chairman.

Mr. MACDONALD. The next witness is our colleague from California, Hon. James C. Corman. Mr. Corman, we will be glad to hear you at this time.

STATEMENT OF HON. JAMES C. CORMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. CORMAN. Mr. Chairman, I appreciate this opportunity to testify in support of the State Technical Services Act.

The State Technical Services Act is landmark legislation which will be of immense value to our entire Nation. But the programs made possible under this bill are of immediate and particular use in those communities in which there are a well-developed industrial enterprise based upon the effective utilization of modern science and technology.

The 22d District of California, which I have the honor to represent, plays a major role in meeting our national commitment in the fields

of space research and exploration as well as in defense. I hope you will pardon my pride in reporting that in the first 8 months of fiscal year 1965, the 22d District has received \$267,632,000 in prime contracts from the National Aeronautics and Space Administration alone. This represents a 12-percent increase over the entire preceding fiscal year. Mr. Chairman, these contracts were earned by the hard work and talent of our creative business leaders and highly skilled engineers and scientists.

This talent and technology must also be put to work to satisfy the expanding needs of civilian production. This is essential for two reasons: both the public and private needs of our economy require the contributions that can be made by systems engineering and scientific discovery. This is the path to full production, full employment, and economic well-being for the United States. Second, those valued citizens who are now engaged in space and defense work must be protected from the erratic rise and fall of Government procurement. We do not advocate the spending of one dollar on Government contracts that is not clearly required by the national interest. We have made that abundantly clear in our opposition to the awarding of contracts as a means of aiding depressed areas. But we must also be sure that the years of experience and knowledge that now supports the space and defense efforts will be constantly engaged in useful and productive work.

The State Technical Services Act is a significant step in assuring the use of that human resource. The act would enable the Federal Government to make grants to States in support of programs to achieve more effective consumer use of science and technology. This would be done through locally planned technical services programs designed specifically to place these findings in the hands of local business. To qualify for the Federal matching funds, a State would designate an institution or agency responsible for preparing and administering technical services programs within the State.

The designated institution would prepare a 5-year plan, outlining the technological and economic situation in the State, the major regional and industrial problems, and the means to be used in assisting in their solution. I might note that the State of California through its Office of Planning and the Economic Development Agency has already undertaken this type of preparation.

The designated institution would also prepare an annual technical services program, covering the objectives for the first year, the budget, and the responsibilities assigned to each qualified institution participating in the program. The 5-year plan and the annual program would be submitted to the Secretary of Commerce for his review.

For example, a technology diffusion program oriented to the needs and problems of a specific industry might offer workshops, seminars, and demonstrations to bring existing technology to local businessmen for their use. A technology dissemination and referral center could offer two types of services: (1) technical reports, abstracts, microfilm, computer tapes, and the like, and (2) referral to sources of scientific and engineering expertise in the fields of interest to the local industry. Such a center would be in continuous interaction with local business and industry, so that its services will be pertinent to the local economy. These examples do not exhaust the limits of possibility which are only bounded by the imagination and initiative of the planning organization.

I am convinced that American private business can continue to provide the goods, services, and the employment required in our free society. Government can and should exert every effort to help private industry do the job. Enactment of the State Technical Services Act will result in more jobs, new products, and a strengthened capacity for the United States to meet its responsibilities to freemen at home and abroad.

Thank you, Mr. Chairman.

Mr. MACDONALD. Are there any questions? If not, we thank you for your testimony, Mr. Corman.

Mr. CORMAN. Thank you for the opportunity, Mr. Chairman.

Mr. MACDONALD. The next witness is our colleague from Iowa, the Honorable John R. Schmidhauser. Mr. Schmidhauser, we welcome you to the committee.

STATEMENT OF HON. JOHN R. SCHMIDHAUSER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF IOWA

Mr. SCHMIDHAUSER. I want to thank the distinguished chairman and the other members of the committee for providing me with the opportunity to speak on behalf of the State Technical Services Act which I have introduced (H.R. 7501) along with a number of my colleagues. I believe this act would be of tremendous importance to the further development of our economy.

The proposal currently before this committee would enable the Federal Government to make grants to States in support of programs to make better commercial use of the latest findings of science and technology. These programs, planned and carried out locally, would place technical findings in the hands of local business and industry. I believe the services provided—which include identifying new opportunities for applying technology to the advancement of regions and industries, preparing and disseminating scientific or engineering information, and facilitating its use—would help to distribute on a wider and more equitable basis our tremendous reservoir of scientific information and knowledge. The end result would be a strengthened national economy. This goal has long been a primary objective of legislative actions. Most Americans agree that as a nation, we share four major economic goals:

1. To promote our economic growth;
2. To improve our competitive position in world trade;
3. To encourage regional economic growth so that all can share in the benefits of an expanding economy; and
4. To achieve and maintain a high level of employment throughout the Nation.

It is my belief that this bill will facilitate the attainment of these much desired objectives. Although we are in a position to attain these goals, our success depends on a continuing advance, nationwide and industrywide, in our use of the results of modern science and technology. At the present time, however, regions of our country share unequally in our general prosperity. I believe the facts indicate that the economic problems of these regions are closely correlated with a slower rate of industrial growth and industrial use of advanced technology. Even within industries, there is a sharp variation in the level of use of advanced technology. This is the current situation

in spite of the great recent increase in research and development. Furthermore, we have only started to tap the possible benefits to the economy as a whole which can be derived from our expenditures in the fields of defense and space.

President Johnson recognized this problem in his Economic Report of January 1964 in which he said we must accept a " * * * challenge to apply the Nation's growing scientific and engineering resources to new socially profitable uses * * *" and directed the Secretary of Commerce to " * * * join with private business and all universities in speeding the development and spread of new technology."

I believe the Technical Services Act would promote this great goal. The State technical service program proposed in this legislation would apply broadly to all industries, all relevant technologies, and all States and regions. It would work, in each region, with existing local technical information centers and extension programs, and will draw on central technical information facilities for input to its own efforts. The emphasis is on the application of technology to economic problems and the general education extension proposal would broadly support many kinds of educational programs. I believe this is an approach which would add increased support to our 4½-year period of constant economic expansion. Furthermore, it would speed the decline in our unemployment rate because of the increased number of jobs which would be generated.

I also would like to say that it is my belief that from this program will emerge new business, improved processes and products, and new services. Furthermore, this act will help make American products from all areas of the Nation, including those from my congressional district in southeast Iowa, more competitive in the rapidly expanding world markets.

This program also will help fill the urgent need for highly trained people to bridge the gap between what has been discovered in the laboratory and what can be used on the production line. We also need special mechanisms and institutions to translate the results of science into the language of applied technology. This will be accomplished by the State Technical Services Act of 1965.

It is my deep conviction that the solutions to the problems facing our great Nation rest on a set of new concepts of cooperation and on a creative attitude toward the problem-solving process. By cooperative effort, such as that envisaged by this bill, I am confident that we will see our free economy expand for the benefit of all Americans.

In conclusion, I respectfully request the committee to approve this legislation and to favorably report the State Technical Services Act.

Thank you for this opportunity to speak on behalf of this most promising program.

Mr. MACDONALD. Are there any questions? If not, we thank you for your appearance, Mr. Schmidhauser.

Mr. SCHMIDHAUSER. Thank you, Mr. Chairman.

Mr. MACDONALD. The next witness is our colleague from California, the Honorable George E. Brown, Jr. Mr. Brown, we will be glad to hear you at this time.

**STATEMENT OF HON. GEORGE E. BROWN, JR., A REPRESENTATIVE
IN CONGRESS FROM THE STATE OF CALIFORNIA**

Mr. BROWN. Mr. Chairman, I have introduced H.R. 8049, which is one of the bills that is before this committee for consideration today, proposing the establishment of a system of State technical service centers.

My purpose in introducing and supporting this proposal is embodied and well stated in the declaration of purpose in the bill, itself, which I know you are familiar with. This declaration of purpose would place Congress on record as believing that "wider diffusion and more effective application of science and technology in industry are essential to the growth of the economy, to higher levels of employment, and to the competitive position of U.S. products in world markets."

It also goes on to state that our research efforts should be placed in the hands of American business and enterprise and expresses the belief that cooperation between the States, universities, communities, and industries can provide encouragement for "a more effective application of science and technology to both new and established industry."

This proposal would provide a national program of incentives to stimulate this cooperation.

Mr. Chairman, there are many uncoordinated efforts by Federal agencies, by universities, or by industry to obtain this dissemination of the massive store of developments, discoveries, and technical information that we have gained through billions of dollars in research efforts.

I am particularly familiar with the efforts of the National Aeronautics and Space Administration in this regard, through its technology utilization centers, and have hopes of being able to stimulate the placement of one of these centers in southern California. This, of course, would not adequately bring the technology of the Department of Defense or the Atomic Energy Commission, for instance, to southern California at the same time.

Other departments and agencies have technical information services of their own, and I am sure that some are available to southern Californians. A central coordinating institution that could properly combine and evaluate the information from all of these sources would, of course, be invaluable to local business and industry.

There is no NASA Technology Utilization Center west of Oklahoma. The large industries that are most involved in defense contract work seem, for the most part, to be quite self-sufficient in relation to development of their own technological needs. The gap arises insofar as smaller or even new industries might be concerned.

The Federal funds that are spent on research are provided by the people of this Nation, and the people of this Nation are entitled to have the benefits of this research made available in as broad a manner as possible for those who might be able to make use of it. I do not believe there is any disagreement on this point.

The need for increased industrial development and growth is, likewise, unchallenged, and it is my belief that these technical services centers would be a great help in fulfilling this need.

I would like to urge that one admonition be given to the institutions operating under the State Technical Services Act in preparing their plans and in developing means to overcome the problems which this act is designed to meet. This would be an expression by the committee that the interests of small business should be kept constantly in mind.

Those who are most in need of this type of assistance and who would be most likely to utilize new and novel developments are our small businessmen. They are less captured by the rigidity that so often enmeshes many of our larger corporations. In addition, the small business is much less able to conduct its own research and development operation. The large corporation, on the other hand, is not only capable, but does rely on its own resources for new developments since it can control the direction of the research.

I would strongly urge the committee to recommend passage of the State Technical Services Act of 1965. Thank you.

Mr. MACDONALD. We appreciate your appearance and testimony, Mr. Brown.

Mr. BROWN. Thank you, Mr. Chairman.

Mr. MACDONALD. I would like to welcome here and recognize the Honorable John T. Connor, Secretary of the Department of Commerce, and say to the Secretary that it is a great pleasure to have you here. This is to my knowledge the first time you have appeared before the Subcommittee on Commerce and Finance, and I personally am looking forward to seeing you many times and I hope for many, many years.

Welcome to the committee.

STATEMENT OF HON. JOHN T. CONNOR, SECRETARY OF COMMERCE, ACCOMPANIED BY J. HERBERT HOLLOWOM, ASSISTANT SECRETARY FOR SCIENCE AND TECHNOLOGY; AND ROBERT E. GILES, GENERAL COUNSEL

Secretary CONNOR. Thank you very much, Mr. Chairman.

Mr. HARRIS. I share the sentiments of our distinguished colleague, chairman of this subcommittee, Mr. Macdonald, in extending a warm welcome to the distinguished Secretary who is appearing before this committee. He was here last week before another subcommittee of this committee. As the chairman indicated so well a moment ago, I think we will have him coming back from time to time. We look forward to it with pleasure on each occasion.

Apparently this warmth expressed by the chairman to the distinguished Secretary of Commerce must be reminiscent of some of the New England background and inheritance. Perhaps if there is as much to Cape Cod as mentioned a moment ago, the subcommittee might do well to see what it is like sometime.

Mr. MACDONALD. I think that is a wonderful idea.

Secretary CONNOR. Thank you, Chairman Harris.

Mr. Chairman, members of the subcommittee, in addition to Dr. Hollowom, Assistant Secretary for Science and Technology, I also have with me Mr. Robert Giles, General Counsel of the Department of Commerce.

I appreciate the opportunity to appear before you this morning in support of H.R. 3420, the proposed State Technical Services Act of 1965.

The proposed legislation would authorize Federal grants to the States under a cooperative program to spread the findings of science and technology throughout American business and enterprise. Its purpose is to speed industrial and economic growth of the States and the country generally through a better application of our technical and scientific knowledge.

Merely having knowledge in existence—in the possession of a relatively few experts—is not enough. Our scientific and technical know-how, which is constantly expanding and improving should be communicated to, and made available to, business firms throughout the Nation. This must be done if the American economy is to realize its full potential from science and technology.

We believe that this bill, if enacted, will help to increase the industrial strength of the entire country, including those areas which are now economically weak. It will stimulate an increase in technical manpower and employment opportunities. It will enhance our competitive position in world markets. It will stimulate creation of new businesses and industries.

This bill is in response to President Johnson's direction to the Department of Commerce. In his Economic Report of 1964, the President said:

The Federal Government should join with private business and our universities in speeding the development and spread of new technology. I have directed the Department of Commerce to explore new ways to accomplish this.

This bill will accomplish what the President asked to be done. The program which we propose would work in the following way: To qualify for Federal matching funds, a State would name an institution or agency to prepare and administer a technical services plan and program for that State. We have called the institution or agency responsible for planning and administering the State program the designated institution. It could be a State university or a State agency. Two or more States could also join in a cooperative program and name a regional institution.

The first task for the designated institution would be to prepare a long-term plan covering a 5-year period outlining the technological and economic prospects in the State, the major regional industrial problems faced and the ways and means a program can help solve them. The amount of \$25,000 a year in Federal funds for the first 3 years, on a nonmatching basis, could be made available to the State to help prepare the first plan and the initial annual program. The State or regional programs would be planned with the advice of broadly based advisory committees reflecting the local or regional interests. All qualified institutions in the State would be invited to participate in the planning.

The bill defines "qualified institution" as institutions of higher learning which have accredited programs in engineering or business administration and those which are competent nonprofit organizations and State agencies. These would all be invited to participate. The State's technical services program would outline a budget and assign

responsibilities to each qualified institution which participates in the program.

After the planning is completed, the designated institution would submit the 5-year plan and the annual program to the Secretary of Commerce through the Governor of the State. The Governor would certify that the plan and program had been developed under procedures and guidelines set out in the bill, which would include proper coordination, adequate rules to avoid conflicts of interest, assurance of non-Federal matching funds, and care in avoiding special treatment to particular firms.

Federal funds would be paid to support approved programs meeting the legal requirements and the purposes of the bill. The grants could be as much as one-half of the amount of the State program, with the remainder coming from State or non-Federal sources. However, maximum amounts paid to the States would be fixed by regulations, taking into account population, industrial and economic development, and productive efficiency and technical resources. This kind of flexibility is necessary to respond to the needs of the States and to encourage imaginative and creative local programs. No State could receive more than its limit, but could get less depending on the merit of its proposals. Regional programs could be allotted an extra 10 percent of the amount approved for payment to the participating States.

Up to 20 percent of the Department's appropriation for this activity could be used to make direct payments on a matching basis for programs that have special merit or are truly national in scope.

A State's long-term plan could, of course, be revised periodically and new plans would be drawn up at 5-year intervals. The annual programs implement the long-term plan; but they must be submitted each year to qualify for annual funds. In administering the bill we would establish a small administrative unit responsible to the Assistant Secretary for Science and Technology. We would, of course, consult and coordinate this work with other Federal agencies, as appropriate. After each 5-year period, a public committee would evaluate the impact of the legislation and make any recommendations necessary to improve it, or possibly to terminate it, if the States by that time are successful enough in stimulating resources to carry the program on their own.

I have described how the legislation would work. For what it would accomplish we might first look to the major imbalances that exist in the use of advanced technology. These imbalances occur among regions of the country and among firms within major industries. Also our large expenditures for national defense and space exploration, while justified for their direct ends, are limited in the extent to which they contribute to the productivity of the rest of our economy. Some industries are unable to adapt to new technology. Other companies within very prosperous industries do not take advantage of the latest technology available, perhaps because they have no way of finding out what it is.

The imbalances, the dislocations and the differences between the healthy and the unhealthy industries create conditions which can result in serious national problems. The regions of the country which are economically most successful and the companies and the industries that have thrived did not achieve their healthy position

only by discovering new knowledge in a laboratory—they achieved it by actually putting new or advanced technology to work in their own plants.

The proposed legislation would not support scientific research or industrial research, nor would it be concerned with developing proprietary products or processes. Its purpose is to promote wider use of the results of research. There is a wide variety of technical services that can be offered to serve this purpose. These would specifically be drawn up by the State or region to meet the needs of the region or of the industry within the State or region. We think better results will occur in the regions and industries through this local initiative rather than by Federal direction.

For example, a principal industry of a State or region might benefit from demonstration models of the latest technology pertinent to the area or from practical workshops or seminars designed to upgrade the training of businessmen and their key skilled technicians. Or possibly a program should stress a new advance in technology affecting a large number of industries or businesses in the State or region. For example, seminars and demonstrations on new metal welding techniques would be useful to such local business interests as automotive mechanics, wrought iron furniture manufacturers, household appliance manufacturers, and construction engineers, as well as others.

Another service which could stimulate a more efficient use of technical data might function through a technical data and referral center in a State. This center could make available technical reports, abstracts, bibliographies, computer tapes, and other data of particular importance to business throughout the State. Equally important it could refer businessmen to experts and consultants whom they could retain. Technology can also help in business management, as well as in engineering and production. For example, a program to introduce managers to the uses of computers in planning better market surveys or for planning their supply or distribution operations would be a very valuable service.

Having shown how the program works and what it might accomplish, let me turn to some revealing facts to show why we need it.

Regarding our balance of trade, it seems clear that with the highest paid labor force in the world, American products having a high labor content are increasingly at a competitive disadvantage. Imports are successfully competing in our domestic markets, even in high technology products such as machine tools, scientific instruments, office and computing machines, motors and generators, railway equipment and aircraft. In 1963, the manufactured machinery which was exported from the United States to the European market averaged 50 percent higher in productivity than machinery installed domestically. This means that European plants are in the process of becoming more productive than our own. One of the most effective steps we can take to reverse this trend is to stimulate innovation and technological improvement in our own manufacturing enterprises. Spreading technology through programs possible under the bill would thus help our position in world trade.

In the free enterprise system we always assume that inefficient producers quickly lose their share of the market and go out of business. Many believe that new techniques which improve productivity swiftly move through an industry, almost automatically. We find,

however, that is is not necessarily so. There is a tremendous spread in productivity between the most productive firms and the least productive firms in some industries which we have studied. (I mentioned this imbalance earlier.) In the machine toolbuilding industry, for example, the most recent data available indicates that 8 manufacturers out of 100 averaged \$18.90 in dollar value added to their product for each man-hour of labor; 28 of the 100 averaged less than \$5. This means that a few modern plants are highly productive but a large fraction of establishments are using obsolete techniques which reduce their competitive position, particularly in world markets. The same pattern exists in other selected industries and we have reason to believe that it exists in nearly every other industry over 20 years old.

Technological improvement is a very complex process. It does not occur readily. It is made more difficult by the risks inherent in innovation. It is also costly, particularly since the cost of basic research and development is rising more rapidly than the price of manufactured goods. In a modern industrial nation such as ours, technical activity and economic well-being seem to go hand in hand. With the results of so much expensive research being inefficiently used throughout the country, it is easy to see why imbalances have developed and why there is now a national need for a program to spread the results of science and technology to all regions, industries, and businesses.

We might ask why the proposed legislation seems to call on universities to perform this function of disseminating technology. We feel that knowledge about the results of research and teaching skills are both essential to effective technical services programs. More often these skills are found at the universities throughout the country. Through engineering schools, the universities are major sources of scientific and technical knowledge. Many universities have demonstrated their ability to stimulate new technology in activities such as their agricultural extension programs. Certainly, the States which now have successful economic development programs regard university participation as being highly desirable for success. But we do not take the position that universities are the only technical resource which could be used in State programs. Other institutions such as nonprofit, technically oriented institutions, foundations, as well as appropriate State agencies, are all excellent resources for carrying out the programs.

In conclusion, Mr. Chairman, the State Technical Services Act, if enacted, will permit some important steps to be taken to place the results of costly research and development into the hands of those who will benefit. It would significantly aid in spreading technology for the public good. I have explained how it will work, what it could accomplish and why it is desirable and needed. In contributing to our economic growth, to an increase in job opportunities, and to an improvement in our international competitive position, the programs under the legislation would be well worth their cost.

I strongly urge this committee to act favorably on this bill.

Mr. MACDONALD. Thank you, Mr. Secretary.

As you say, and you have explained in some measure how the plan would work, and what it would accomplish and why it is desirable and needed, to use your words. One question did come to my mind

as you made your statement and while I don't mean to sound like the distinguished gentleman from Iowa, one of our colleagues, I was wondering how much this program would cost if it were adopted, that is, the cost to the Federal Government.

Secretary CONNOR. Mr. Chairman, we have estimated that the cost in the first year will be about \$9 million to get the program started. We have estimated that over the 5-year period for which this initial planning would be contemplated, the cost would be approximately \$140 million.

Mr. MACDONALD. Do you have any breakdown of how those costs would be allocated to the various sections of the Department or where the money would go?

Secretary CONNOR. No, sir. We don't have a breakdown on a State-by-State basis which would be meaningful. As I have indicated in the testimony, we would work out a formula which has not been completed yet which would establish a minimum amount which would go to each of the 50 States and then a maximum worked out on a basis such as population. But this has not been completed yet.

Mr. MACDONALD. Well, as I understand it, obviously it would be a voluntary program on the part of the 50 States.

Secretary CONNOR. Yes, sir; that is right. Each State would have to take the initiative in order to qualify for participation in the program on a matching basis. The Federal Government would contribute no more than 50 percent of total cost of an approved plan.

Mr. MACDONALD. Then I would take it you would be really hard put to find out how much it would cost unless you knew how many States are going to participate.

Secretary CONNOR. That is right. We can only make some rough estimates at the present time based upon our understanding of the amount of interest in the States and their ability to respond to the availability of such a program within the first few years after passage of the bill.

Mr. MACDONALD. Right. Has the Department put out any tentative feelers or asked for expression of opinions from the various States, the departments of commerce of the various States, as to what degree they would be interested in such a plan?

Secretary CONNOR. Mr. Chairman, Dr. Hollomon has had several meetings with respect to the need for such a program and this legislative proposal has engendered a considerable amount of interest. I think it might be interesting to the committee if Dr. Hollomon would give some description of those meetings and what responses have been obtained.

Mr. MACDONALD. I am sure the committee would be glad to hear them.

Dr. HOLLOWON. Thank you, Mr. Chairman. My name is J. Herbert Hollomon. I am Assistant Secretary of Commerce.

We have had a number of meetings with representatives of each of the States who are responsible for economic development activities in the States, with business groups, and with professional groups of various kinds. We wrote, on a number of occasions, to the Governor of each State asking for his comments upon the bill and how it might be administered.

Our present guess is that approximately 30 to 35 States would be in a position to begin some activity under the bill within the first year.

This would be modest in some States and more dramatic in others. There are six or seven States in which fairly active programs of this type are now underway. They have the manpower; they have people who have been doing some planning. There are a number of States that have introduced proposed legislation into their own legislative bodies, in anticipation of this bill, giving authority to the Governor or to a certain State agency to provide for the matching funds.

Mr. MACDONALD. If I could ask at that point, how many States have done this, do you know?

Dr. HOLLOMON. I know of at least two that have done that. So, to answer your question directly, I would think that something of the order of 30 States could participate within the first year, but not to their maximum capabilities. The bill calls for a nonmatching payment of \$25,000 a year to each State for a 3-year period to provide the State with funds to start planning its program.

Mr. MACDONALD. Maybe I didn't follow the testimony closely enough, although it is a fine statement and I tried to follow it as closely as possible, but what would be the relationship between the universities in the various States and the State governments themselves?

Dr. HOLLOMON. The present plan calls for the institutions that would actually carry out the plan to be generally colleges and universities which offer, as a minimum, a qualified engineering degree or qualified degree in business administration. The purpose of the State agency is to bring together the institutions in the State, which I have just mentioned, and decide what each one wishes to do in terms of the industry of the local area of their institution.

It is the intention of the bill that the technical services provided under the bill would be carried out principally by the State's technical universities and colleges. The purpose of the State institution is to bring together the plan for the whole State.

Mr. MACDONALD. Well, for a concrete example, I don't mean to sound parochial, but in Massachusetts, with which I am familiar, we have Harvard, Northeastern, Massachusetts Institute of Technology, and perhaps others—

Dr. HOLLOMON. University of Massachusetts.

Mr. MACDONALD (continuing). And I take it that the State's function would be to sit down with representatives of each one of the institutions that I have mentioned, perhaps others, and ask them what sort of plan they have or ask them for a consensus of what a plan should be. Is that it?

Dr. HOLLOMON. The Governor—

Mr. MACDONALD. Or each university and—

Dr. HOLLOMON. The Governor of the State would designate one institution in the State to be responsible for making the plan. That institution would have submitted to it the specific programs for all of the various institutions that you just mentioned.

The purpose of having only one agency do the planning is to assure that if MIT wishes to do something in a certain area of the State, it isn't identical to what the University of Massachusetts would do, or is not identical to what some other institution in the State would do.

The second purpose of having the designated institution is to find out what the problems of the State are.

Mr. MACDONALD. Wouldn't that cause friction perhaps between the various institutions? As a concrete example, at the Boston City Hospital—once again I hope I am not sounding parochial, but one illustration will go to the general thought I have in mind—at the Boston City Hospital, Harvard, Boston University, and Tufts Medical School all use that hospital for training their students and they are in the midst right now of a headline type of hassle as to who should run the hospital. And I was wondering if just designating one institution out of, say, five, wouldn't lead to some controversy?

Dr. HOLLOWON. This was recognized in the various correspondence we have had and in our discussions with many people. The bill, therefore, says that the State may designate as the planning agency either a land-grant college, a State university, or a State agency, either one or the other, for making the central plan for the State.

Mr. MACDONALD. In that case that would take away the nationally recognized leader—Massachusetts Institute of Technology—and give it to the University of Massachusetts which is the only land-grant college.

Dr. HOLLOWON. No, sir. I went to MIT. I will be parochial, too, if I may. It is a land-grant college, too. MIT strangely enough is a land-grant college in the State of Massachusetts.

Mr. MACDONALD. You learn something every day.

Dr. HOLLOWON. I did, too. I didn't know it until after I had been graduated for 20 years.

Mr. MACDONALD. Now, to take it down to just two institutions, however—

Dr. HOLLOWON. For the designated agency, that is correct, sir.

Secretary CONNOR. But, Mr. Chairman, in a particular State where the Governor has the kind of problem you indicated, if he so desires and if there is a State agency such as an agency for economic development or an outstanding organization that has emphasized technical activities, he could designate one or the other of those. So the Governor will have a great deal of flexibility. But in the instance where he departs from the land-grant college or the State university, then there has to be some kind of an objective justification for doing so.

Mr. MACDONALD. The matching funds from the Federal Government go only to the designated institution, is that right?

Dr. HOLLOWON. Matching funds go, through the designated institution, to whichever qualified institutions carry out the programs.

Mr. MACDONALD. All participating institutions.

Dr. HOLLOWON. Yes, sir.

Mr. MACDONALD. Mr. Springer?

Mr. SPRINGER. Mr. Secretary, you may have answered this, but I want to be sure. How much do you estimate the program to cost for each 1 of the first 3 years.

Secretary CONNOR. The first year's estimated cost, Congressman Springer, is \$9 million and for the 5-year period that we are talking about here, the estimated cost would be \$140 million, assuming participation by the States in accordance with some assumptions we have had to make. That is the maximum cost, sir.

Mr. SPRINGER. In the neighborhood of about \$28 million a year average for a 5-year period; that is correct?

Secretary CONNOR. It is hard to give an average because this will be an accelerating program. But we estimate that the maximum cost once it gets underway is \$40 million a year.

Mr. SPRINGER. Right now do you expect this to be a continuing program?

Secretary CONNOR. We would hope so, sir; but we recognize that Congress will want to take a look at it from time to time. Our suggestion is that the authorization in this bill be subject to review by Congress at the end of a 6-year period so that the 5-year plan that is contemplated in the bill for each State could get underway. We also suggest that there be a review by the kind of national advisory committee that is contemplated in the bill and that its findings be available to the Congress to determine whether or not the whole program should be continued.

Mr. SPRINGER. Mr. Secretary, what would the program cost for the first 3 years?

Secretary CONNOR. Our estimate is \$9 million the first year, it it accelerates into the order of magnitude of \$15 to \$20 million, as I remember it, the second year, and then in the order of \$20 to \$25 million in the third year.

Mr. SPRINGER. \$9 million approximately the first year, \$20 million the second year, and approximately \$25 million the third year?

Secretary CONNOR. \$25 to \$30 million.

Mr. SPRINGER. Then \$9 million the first year, \$20 million the second year, and \$30 million the third year, is that about right?

Secretary CONNOR. I would like Dr. Hollomon to give a few—

Mr. SPRINGER. Let's have him. This is his brainchild. He has talked to me about it.

Dr. HOLLOWOM. Not entirely my brainchild, sir. The numbers the Secretary has given you presume that all the States would participate in the program to the full amount. We made estimates on the basis of each State participating in the program fully, so these would be maximum amounts. The approximate amounts which the Secretary has given you, are \$8 or \$9 million the first year, \$20 million the second year, \$30 million the third year, going up to the full authorized program at the end of the fourth- and fifth-year period.

Mr. SPRINGER. All right. Mr. Hollomon, since you are talking on this, I think you are the expert. How many centers do you anticipate in each State?

Dr. HOLLOWOM. Mr. Springer, there are approximately 200 institutions in the United States that give bachelors degrees in engineering that are accredited at the present time and an additional 25 or so that don't give engineering degrees but give the bachelors degree in business administration. So, not counting the few institutions, the qualified nonprofit institutions and State agencies that might be included in the bill, the total that could possibly participate are of the order of 200. It would be my guess that even with the full implementation of the bill, no more than half of those would actually be involved.

Mr. SPRINGER. You are thinking in terms of approximately a hundred institutions?

Dr. HOLLOWOM. Yes, sir; of that order.

Mr. SPRINGER. All right. Now, how many State agencies—I understand they also qualify, is that correct?

Dr. HOLLOWOM. The qualified institutions are institutions that either give a degree in business administration or in engineering, or nonprofit institutions with certain qualifications. The State agencies

in this case are the agencies that could make the plan for the State but would not necessarily participate.

Mr. SPRINGER. Would they share in the funds?

Dr. HOLLOWOM. Not if they do not meet the criteria which I just stated.

Mr. SPRINGER. But they are eligible for funds, State agencies, if they qualify?

Dr. HOLLOWOM. Yes, sir.

Mr. SPRINGER. And it is possible that they could qualify and not a public institution, is that correct?

Dr. HOLLOWOM. Would you clarify the question?

Mr. SPRINGER. It is possible that the State agency would act instead of an institution in some States; is that correct?

Dr. HOLLOWOM. To do the planning, yes sir.

Mr. SPRINGER. To do the planning only?

Dr. HOLLOWOM. Yes, sir. Only to do the planning.

Mr. SPRINGER. But as far as the actual gathering of the research and being the center for it, that would be in the nature of a State university.

Dr. HOLLOWOM. Not necessarily a State university—any institution that gives a degree in engineering, business administration, or certain nonprofit research and development institutions.

Mr. SPRINGER. The center then would be a university?

Dr. HOLLOWOM. You can almost say that unqualifiedly.

Mr. SPRINGER. Now, you anticipate that there would be approximately 100?

Dr. HOLLOWOM. Yes, sir.

Mr. SPRINGER. Would there be any State that you know of at this moment which could not qualify?

Dr. HOLLOWOM. No, sir.

Mr. SPRINGER. Is it your belief that everyone of the 50 States could qualify?

Dr. HOLLOWOM. Yes, sir; if they did the necessary planning and took some initiative.

Mr. SPRINGER. Is it your thought, Mr. Hollowom, this would be a permanent agency of the Department of Commerce?

Dr. HOLLOWOM. Mr. Springer, we have tried to, as the Secretary indicated, place in the bill the requirement that the program be reviewed at the end of a 5-year period to see how and under what conditions it is successful. It is my personal feeling that, in time, the initiative for a program of this kind should increasingly fall upon the States and industry. My own view is that we ought to take a look at the problem at the end of the 5-year period. Some States will have difficulty getting started with a full 5-year plan by the very nature of things. I think it depends very much on the degree to which the individual States and universities take the initiative and make plans.

Mr. SPRINGER. Now, is it your thought to gather industrial and technological research for industries and business? Am I stating this correctly?

Dr. HOLLOWOM. To gather the information that is available about it, but not the research itself. That is correct.

Mr. SPRINGER. Would you keep a category index of research?

Dr. HOLLOWOM. We would not do that but I think that is one of the important things that might develop in a State plan—to know exactly what research is going on in the field that they select and provide that information to industry.

Mr. SPRINGER. Now, is this agency—we will say that it is X University in Iowa—will they gather research and data only within the State of Iowa?

Dr. HOLLOWOM. No, sir. Pertinent information from the whole country would be gathered.

Mr. SPRINGER. They will gather research—

Dr. HOLLOWOM. Information.

Mr. SPRINGER. Information?

Dr. HOLLOWOM. Right.

Mr. SPRINGER. Wherever it may be that they think is useful in Iowa.

Dr. HOLLOWOM. That is correct, sir.

Mr. SPRINGER. Now, is there any central location, either in existence now or you plan to put in existence, which will be a central agency for all of this information?

Dr. HOLLOWOM. Yes, sir. The bill calls for the establishment of a referral center in the Department of Commerce so that the information collected by Iowa, to follow your example, concerning a particular industry, can be put together and made available to Massachusetts or Maine so that there is no duplication of the information that is collected in the States. Other States and other universities could, of course, call upon that central referral center. I believe this is one of the most important aspects of the bill. It will provide for such a central referral center.

Mr. SPRINGER. Is there at the present time any either private or public agency trying to put this together in one central agency.

Dr. HOLLOWOM. No, sir. Not to my knowledge.

Mr. SPRINGER. You are sure of this?

Dr. HOLLOWOM. Not to my knowledge. I am as sure as I can be.

Mr. SPRINGER. May I say as an example, why I am bringing this to your attention, the Subcommittee on Health and Science which is a tremendous field in research—

Dr. HOLLOWOM. Yes, sir.

Mr. SPRINGER (continuing). Last week opened this up. We found out that—well, I believe it was the Bureau of Medicine, and I think this is in NIH—

Dr. HOLLOWOM. Yes, sir.

Mr. SPRINGER. They have now started a computer system and it was my understanding that this computer system now computes all of the articles on research in medicine, in any way, each month and that apparently—and this is only by title—this is not the article nor the substance of this—just the title and maybe three or four lines telling about it—that this computer system is the only way they can do it and that at the end of each month this compiles, I forget how many volumes per month. Now, is this what you have in mind?

Dr. HOLLOWOM. No, sir. The primary problem is to determine what the needs of the local industry are and to provide information, not necessarily coming from research but coming from technical activities of any sort, to make the industries of the region knowledgeable about the resources that are available. Let's take a similar

example, although not in the medical field. In the Department of Commerce there is a thing called the Clearinghouse for Federal Scientific and Technical Information that puts out computer tape reports and abstracts for all of the reports that come out of the Federal Government's large research and development program, other than medicine.

This information is not generally readily available to small industries or large industries, throughout the whole of the country. One of the things that this program would do would be to make that information available to the universities and they would, in turn, provide it in a useful form to local industry. That is one of the purposes of the bill.

But that is only information developed in the federally supported research and development programs.

Mr. SPRINGER. Now, will this program in its category do that which is in writing or will there be a field group to visit the factories and industries to find out what they are doing?

Dr. HOLLOWON. There could be a field group. Each State would do what it feels is most effective. This is not going to be mandated by the department or by the Federal Government. In the case of the small program that is underway in Georgia, they have a field group which goes out and provides talks, seminars and information to the industry in the State of Georgia. In the State of Iowa, which has a program under way, they have a central information service of the kind you described—not to collect all the information but only the information they believe is most pertinent to Iowa industry.

So there are two different examples of programs.

Mr. SPRINGER. So this would be two examples of what would be done.

Dr. HOLLOWON. That is what might be done if the State felt it was important.

Mr. SPRINGER. Now, would it be in order for an industry to come to the central agency, whatever it may be, in the State of Iowa, and to seek information about their own particular industry? Is that right?

Dr. HOLLOWON. Yes, sir.

Mr. SPRINGER. Is there anything in the nature of this program which goes out and advise communities on how they may get industries, or anything like that?

Dr. HOLLOWON. Only in the sense that the program calls for doing technical and economic studies, if these are believed to be important to the State. This may be valuable to bringing new industry. If a State has particular opportunities for new products and services or particular resources, then this program would permit the dissemination of that technical information to potential new industries.

Secretary CONNOR. Excuse me. Just following that up, Congressman Springer, I think the actual promotion of the State to industry elsewhere in order to attract that industry to the State would have to be done through the State resources other than those provided in the bill. This bill would have nothing to do with the promotion of the State.

Mr. SPRINGER. Do you seek to advise a local community of what will fit their own—

Dr. HOLLOWON. Only from a technical point of view. For example, what sort of technical opportunities there are in the State?

Mr. SPRINGER. We will say Des Moines, some small town near Des Moines, asks for a survey by this agency. Do you go out and make a field survey, at Lawrenceville, Kans., we will say, to determine what would fit that community? Is that a part of this program?

Dr. HOLLOWOM. I think this program could carry out special technical studies of that sort; yes sir.

Secretary CONNOR. But it would have to be a part of the State plan. It wouldn't be ordained from Washington.

Mr. SPRINGER. Does the State as a part of this aid the overall plan?

Dr. HOLLOWOM. Yes, sir.

Mr. SPRINGER. Could you give me an example of what that overall plan may be?

Dr. HOLLOWOM. The overall plan would consist first, as indicated in the bill, of some analysis of the kind of industries in the State and the kind of technical problems that the State has. It would indicate how each of the qualified institutions of the State would participate, what kind of programs each university would have, and how it would insure that they don't overlap; that is, three institutions doing the identical thing within the State. It would indicate that the State has sought either State funds or industrial funds as its matching part of the program, that is has set up an advisory committee for the State program with industrial as well as university representatives and it would indicate how they are going to measure the success of the program. That is the kind of State planning in general terms that would be submitted.

Mr. SPRINGER. They don't set up a plan to determine that southern Iowa would fit this and middle Iowa would fit this and northern Iowa would fit that.

Dr. HOLLOWOM. No: I would not think so in that detail.

Mr. SPRINGER. That is all, Mr. Chairman.

Mr. MACDONALD. Mr. Harris.

Mr. HARRIS. I will defer to the other members of the committee at this time, Mr. Chairman.

Mr. MACDONALD. Mr. Huot?

Mr. HUOT. Nothing at this time.

Mr. MACDONALD. Mr. Farnsley.

Mr. FARNSELY. Doctor, I went to the University of Louisville which got its land grant from the Commonwealth of Kentucky in 1798. I think we had better stick together or the Federal land grant schools will take over. They are coming fast.

I think your program is wonderful. Unlike most things the Federal Government does, instead of doing harm I think it will do good. I think the people will think you are spending money. In this case it isn't spending money but investing money because this money will come bouncing back many times over in increasing tax revenues. I can't see anything wrong with it.

There is another way to spend money to make money. This committee set up an international travel bureau, the U.S. Travel Bureau. From my information from my experts back home, overseas governments and airlines and steamship lines spend four times as much to lure our people to their countries as we spend to lure them to our country and to nobody's surprise, they get four times as many tourists who spend four times as much money and that knocks the whole thing out of balance.

Ten percent of the money overseas visitors spend goes directly to the Federal Government for taxes, so that if we plow back half of what they spent last year we would be spending maybe \$15 or \$20 million bringing them in whereas we are now spending 3 or 2.

And in 2 or 3 years the balance of payments would be balanced.

Have you had a chance to look into this question or is this under your purview, Mr. Secretary?

Secretary CONNOR. Yes, Congressman Farnsley. The U.S. Travel Service is within the Department of Commerce. We did ask for an increased appropriation this year but it was turned down. I would hope that next year at appropriations time we will have such a strong case that we will be able to get the support for a larger appropriation from the appropriate subcommittee of the Appropriations Committee.

The travel program in my opinion is extremely important. The U.S. Travel Service has authorization for programs designed to bring foreign visitors to this country. I think this is extremely important now because of our balance-of-payments deficit. This could help considerably in that. It would also help because of the income generating activities that would be stimulated by these foreign visitors. So we are emphasizing it.

We plan to give it even more emphasis in the future.

Mr. FARNSLEY. Thank you, Mr. Secretary. Good luck.

Secretary CONNOR. Thank you.

Mr. FARNSLEY. It is important.

That is all.

Mr. MACDONALD. Mr. Springer?

Mr. SPRINGER. Mr. Secretary, will the effect of this program be to consolidate the efforts of other agencies of the Federal Government in this field?

Secretary CONNOR. Congressman Springer, at the moment no other agency of Government is performing this kind of a function. We think that by moving now, this program will make it unnecessary for other programs to get into the field and it will stimulate within each State the centralization of this kind of planning and program making. I don't think we could say that it will eliminate anything that is now going on, but looking down the road 20 or 30 years, it will be an economical and efficient way of doing this.

Mr. SPRINGER. Now, according to my information, NASA is spending about \$5 million a year, this year, to get its information out to industry. AEC has some money also, as does the Department of Defense, Health, Education, and Welfare I know; and Agriculture rather a considerable amount.

Secretary CONNOR. That is right. Those programs are designed to encourage the use of the information, particularly technical information, that comes from those programs. They are promoting the use of that kind of information to get a side benefit from the conduct of the work itself.

Mr. SPRINGER. Well, now, do you visualize that your agency is going to combine any of this?

Secretary CONNOR. We will make use, Mr. Springer, of the information that is available from those programs but the emphasis in our program is at the other end of the spectrum.

Our program contemplates that within each State, the people responsible in that State will look at the needs of the State and draw up a plan which can be submitted and approved. Then as that plan goes forward for implementation, the technical information that comes out of the NASA program and the others you have mentioned can be funneled into that State to the extent that it fits in with their program and the information is needed. But the information used in that State will not be limited, by any means, to what emerges from those specific Government programs.

Mr. SPRINGER. Do you visualize that the information that these five agencies that I have named—that you are going to pick up that information in your central agency here in Washington; is that right?

Secretary CONNOR. Yes; very definitely. That information will be available, but it may have no relationship whatsoever to the needs of a particular State. That State may need technical information from completely different fields in which none of those five agencies play any role.

Mr. SPRINGER. Thank you, Mr. Chairman.

Mr. MACDONALD. Mr. HARRIS.

Mr. HARRIS. Mr. Secretary, I want to thank you for your presentation here today, and for your very frank and candid discussion of the problem. I am somewhat sympathetic to this. I think you have a program that could contribute a great deal to technological developments. We have long since come to the point where in all parts of our Nation this information has to be made available. We must strive for a balanced economy in our expanding economy, expanding Nation, expanding population, and expanding methods of transportation and communication. As to the latter, other phases of our development in this country have not kept pace with communications and transportation. If I have any criticism, which I must say in all frankness, to your proposal here, it is the lack of a positive approach. It seems to me the program that you have presented here is so general, as was indicated by the chairman of the subcommittee at the outset, that I am fearful as it goes on this could take off in an entirely different direction from what you have outlined. Here as I look into it, I think you have a program that is not duplicated in any way regardless of the innumerable and vast research programs that we have. Is there any other program in any field where there is a required cooperative program of States?

Secretary CONNOR. No, Mr. Chairman. This is a new approach. By looking to the State for a study of its industry deficiencies and the opportunities within that State, we are taking a completely different tack from what has been done before.

Mr. HARRIS. Well, it has appeal to me because of its broad application. One of the criticisms I have of NASA as an example, or AEC, you can take any of these scientific programs we have, they seem to just fit into certain sections of the country, and we have experienced in the past during the days of our military program, meaning our defense program and so forth, there were general applications of this development all over the country. You saw it in Illinois, you saw it in Massachusetts, in New York, in California, some in Arkansas, in Missouri, all other the country. It was sort of a thing that reached out to meet the national needs.

Now we have these programs of large, vast, and important research programs, that seem to fit Florida or Houston or California, and we are seeing all of the development pulling our population into these particular areas. In my judgment it is going to cause difficulty one of these days. It is going to make it necessary to meet the problems that are going to those particular sections.

Now, obviously they are getting the benefit out of it. There is a little trickle here and yonder. There is a little AEC project I think with various private companies in northwest Arkansas in cooperation with the University of Arkansas, but it isn't anything like a program to provide the immediate benefits that are being derived by the immense resources of this Nation out of each other. So that from that standpoint this certainly does appeal to me. I observed in section 5 you provide that the Secretary shall not accept a 5-year plan—I want to ask you something about that in a minute, Mr. Springer has but I want to develop it a little further—for review and approval under this act unless the Governor of the State or his designee determines and certifies that the plan is consistent with the State policies and objectives.

Now, it seems to me that puts the responsibilities right back down in the State and if a given State says we do not want to keep up with the rest of the country, that is our decision. But if we want to in our competitive system try to maintain a balance and keep up, and we have a far-looking Governor who wants to do something for his State, he has an opportunity in cooperation with the institutions of the State, it seems to me there are great possibilities that could come from this.

But I do have some problem with your approach here where you say an institution may be designated to do this planning, or an agency as the case may be.

It would seem to me if it is really going to be the kind of a program that you set out here, if it is provided that this planning program would be through a State agency and not an agency or an institution, as the case may be, then one or all the institutions who desire in that State could, with the cooperation of the agency set up or designated by the Governor to plan this program, give a better balanced program and we would avoid the things that Mr. Macdonald mentioned a while ago.

I mentioned that for your consideration because I feel that you could in this way have something positive that the State will work toward. They will set up a program for the planning. We did that in the hospitalization program. It worked very well. We did it in the mental health and retardation program which is coming along now very well. There is a definite responsibility and they don't have the bickering back and forth of this or that institution trying to get the advantage within the State, by arguing "let everything be channeled through me."

Then if the agency with the cooperation of one or more institutions develops its plan, which you provide here, and submits it to you for your consideration, that plan will say that the University of Arkansas is in a position to do so and so or MIT is in a position to do so and so and the University of Illinois, Northwestern University, whatever the case might be, then you would have it before you and

here this State will say through this planned program we are in a position to cooperate in trying to carry it out, and it seems to me that with that kind of approach you might have a more positive approach to a final solution to the problem.

Secretary CONNOR. Well, Chairman Harris, as you know, the facts vary widely from one State to another. There is enough flexibility in the language of the bill so that the Governor of the State, looking at the factual situation in his State, could make that designation if he has an appropriate State economic development agency or some similar agency. On the other hand, if he has a concentration of people in a State university or a land-grant college, who are particularly interested in this kind of economic development, then he could designate such an institution. So there is considerable latitude in the statute.

Now, perhaps as you say we should give it—

Mr. HARRIS. This latitude at this particular stage and the flexibility that you are talking about.

Now, Mr. Springer mentioned a moment ago our health program. Without any implications or even indicating that I give any thought to it at all, we set up an advisory committee and so far as the applications of these research programs that I have had come to my attention, time after time it is a rather unusual thing that members of the advisory committees seem to always come out and have express grants made to the universities that they represent.

Now, human nature works the same in every place and I think that we have got men of honesty and integrity on these advisory committees but we left the loophole there for these applications to be made and for the implications to arise. I just don't believe that we can get great results unless we do try to put this into focus. We would like to have nothing but the highest integrity and the confidence of everybody going into it, and it seems to me that that would be the way to do it. You have your agency now, the Governor. The Governor can use whatever he wants to, whatever agencies. He may have one—in my State they had the department of welfare in this other program. It might be the commissioner of education in a State. I don't know. It might be the AIDC in the State. It might be some other agency. Let the Governor have that responsibility. And with the educational institutions or the other programs in the State, industry and all cooperating, they can develop a plan in my judgment. On the other hand, it seems to me the human reaction is going to be, as Mr. Macdonald mentioned a moment ago if MIT gets it Boston College is not going to be looking at MIT through rose-colored glasses. They are going to get the clearest vision they can to see what is going on. And I just question in my own mind—I hope you don't mind—what you are going to run into.

Secretary CONNOR. Chairman Harris, this is an extremely important point. I think you have put your finger on what could be a difficulty. Within some States there is great rivalry between or among the educational institutions and in a particular situation the Governor, if he has a State agency available, might well prefer to designate State agency in order to avoid the kind of—

Mr. MACDONALD. If he doesn't have, let him set up one.

Secretary CONNOR. Yes, sir. He can. But this deserves some more thought. So let's think about it further, if you don't mind.

Mr. HARRIS. Yes, sir. I just believe that this thing ought to be put in focus a little bit more clearly than is proposed as I have gone through the bill, and I tried to analyze some of the provisions.

Now, you mentioned earlier that the institutions for higher learning would be qualified if they offered degrees in engineering or business administration. Further down in the same paragraph, bottom of page 3, you mentioned nationally recognized accrediting agencies or associations determined by the Secretary, to be reliable authority as to the quality of engineering or business education or training offered.

Now, who do you intend to include in that group?

Dr. HOLLOMON. Mr. Chairman, there is, in the case of engineering with which I am more familiar, an organization called the Engineer's Council for Professional Development which accredits the curriculum, the faculty, and the degree of competence of engineering schools in the country. It determines that their resources, their facilities, their curriculum meet certain minimum standards. There is a similar one, and I am not as familiar with it, for business administration. The bill says that the U.S. Commissioner of Education would determine whether qualified accrediting agencies existed. If there were none, he would make a list of qualified institutions. But there are officially designated accrediting institutions that—

Mr. HARRIS. This means that these agencies referred to would be for accreditation only.

Dr. HOLLOMON. That is correct.

Mr. HARRIS. And it would not mean that they would be considered as an institution and would be a part of this program.

Dr. HOLLOMON. They would be qualified to participate in the program that sets the minimum qualifications, Mr. Chairman.

Mr. HARRIS. Well, now, that bothers me a little.

Dr. HOLLOMON. Perhaps I misunderstood.

Mr. HARRIS. If they are set up for the purpose of accreditation of institutions I don't see why they should be possible participants in the program.

Dr. HOLLOMON. I think there was a misunderstanding.

Secretary CONNOR. The national accreditation organizations would not be participants in the program.

Dr. HOLLOMON. I misunderstood you. Secretary Connor is correct.

Mr. HARRIS. This means, then, that would be utilized by the Commissioner of Education or the Secretary as the case might be. The Commissioner of Education, in its publishing of the list, would use these institutions, accreditation agencies for the purpose of determining who was accredited.

Dr. HOLLOMON. That is correct. I misunderstood your question.

Mr. HARRIS. Yes. I wanted to be sure of that.

Secretary CONNOR. Chairman Harris, as the program in each State goes along, the conduct of technical service programs involving say, three or four institutions might lead to some overlapping if they were not coordinated. For instance, the central agency could say to University Y, "Well, now, you keep going ahead in this field but because university X over here has already gone so far, you should veer off to the right or left or you don't have to go forward." In other words, some kind of central coordination will be needed to avoid inefficiencies.

Mr. HARRIS. Well, after the plans have been developed and submitted, the program suggested, and so forth, and you approve it, now, would an application come from the institution through the designated agency?

Secretary CONNOR. In the particular State, yes, it would.

Mr. HARRIS. Yes. Or if it is an institution designated it would have to go through that institution?

Secretary CONNOR. That is right, sir.

Mr. HARRIS. And if the University of Arkansas decided it wanted to carry on a certain particular research program in technology, this would be made available to all business, not only within that State, as I understand, but all over the United States.

Secretary CONNOR. Well, the purpose of the plan in Arkansas would be to help business in Arkansas but once the information was pulled together and made available, say, by the University of Arkansas, to business in Arkansas, that very information would get recorded at the Federal level so that—

Mr. HARRIS. And if the University of Illinois wanted it, it could have it.

Secretary CONNOR. That is right.

Mr. HARRIS. Now, that particular application, then, would have to come through the State agency or an institution.

Secretary CONNOR. That is right, sir, as part of the plan.

Mr. HARRIS. And it would come to you.

Secretary CONNOR. From the Governor of the State, that is right.

Mr. HARRIS. And it would have to carry a proviso giving assurances that the State or some other source would provide one-half of the total amount of the application.

Secretary CONNOR. That is right, at least one-half. And that one-half or more from the State could either come from State funds or from contributions from businesses, industries, and even nonprofit organizations within that State.

Mr. SPRINGER. Would the chairman yield at that point for clarification?

Mr. HARRIS. Yes.

Mr. SPRINGER. Did you say that one-half share would come from the institution itself?

Secretary CONNOR. The State's 50 percent or more share could come from State funds or from contributions from private industry within the State or from the funds of nonprofit organizations such as the Ford Foundation, and so forth.

Mr. SPRINGER. But the institution itself could not contribute its own 50 percent.

Secretary CONNOR. It wouldn't be expected to but I don't recall whether there is any authority for it.

Mr. SPRINGER. Thank you, Mr. Chairman.

Mr. MACDONALD. Will the chairman yield?

Mr. HARRIS. Let me finish this. I don't see any language here that prohibits it.

Secretary CONNOR. I think you are right, Mr. Chairman. It is not prohibited and if in a particular case the State's share were not available from the other sources, I wouldn't see any prohibition against a particular university making the contribution.

Mr. HARRIS. Apparently it would seem to me if the State wanted to provide its 50 percent or more for a particular program through the university channels, there would be no objection to that or there would be no prohibition to it.

Secretary CONNOR. No, sir. There is no prohibition. The bill just says that the State's contribution would be available from State or non-Federal sources. The wording is broad enough to include the kind of contribution you are talking about.

Mr. MACDONALD. On that, I would just like to comment, universities are pretty good in raising money but they don't seem as good in spending money. So I don't think it would be much of a problem. But what I wanted to ask you in connection with what the chairman of the full committee was discussing with you is this: I can understand the relationship between the State, State agency or institution and the Federal Government, but I don't understand, and I don't think anybody has given testimony pertaining to the relationship between the Federal Government and a given region. You keep talking in the bill of region-Federal participation. Could you explain that for the committee, or for me at least?

Secretary CONNOR. Yes, Mr. Chairman. Let's take the Mountain States as a possible regional grouping. It is quite conceivable that several of the Mountain States might get together and prepare a plan which could qualify for the matching grant under the bill.

Mr. MACDONALD. Would there be just one agency for the region?

Secretary CONNOR. Probably.

Mr. MACDONALD. Who would appoint that agency? If there were several States in a region; take Appalachia for instance.

Secretary CONNOR. The authority in the bill for these appointments rests with the appropriate authority in each State which could be the Governor. So the Governors by agreement could get together and decide who would be the representative of the region if there is a regional plan.

Mr. MACDONALD. And how does the bill, if it does, and if it does not—I haven't seen it—how would the Department define region?

Secretary CONNOR. There is no geographical definition. It is really left to the discretion of the States themselves by the provision that two or more States can get together for a regional plan.

Mr. MACDONALD. Well, I don't want to carry this too far, but theoretically, all 50 States could say they were a region, a region of the United States. I don't quite understand what value the breakdown for region brings to this bill.

Secretary CONNOR. Dr. Hollomon has had some discussions which I think will be helpful here.

Dr. HOLLOMON. The purpose of the regional activity is the following: Any two or more States, if they decide that they could carry out this plan, or any part thereof, best by joining together, could make an agreement to join together to make a plan for the two or more States.

Let me give you a specific example. I think it is easier to deal with specifics in this case. There is consideration being given in New England, for example, that instead of having a separate referral center for industrial information in each State in New England, at different institutions in each State, the States would get together and have one central place where this information was readily available. With

the close distances in New England, that might be very effective. The State Governors could agree that one institution in the several States would provide this central function.

They don't need to combine all of their State's plans. They just combine that central function and if they do so, this bill would encourage them by permitting the Secretary to give them 10 percent additional for that purpose. This is economy.

Mr. MACDONALD. If I follow you, then, the region would be merely used as a clearinghouse.

Dr. HOLLOMON. If that is desirable. Right. In other words, if two States that had essentially identical problems agreed that they wouldn't duplicate themselves and they agreed to do something together, we would encourage this in order to try to prevent duplication in the States. But this doesn't mean that you would have every State getting together on their whole program.

Mr. MACDONALD. Well, to go forward with your illustration, in New England, do you look to just one institution being designated, say MIT being designated—

Dr. HOLLOMON. No, no. Not at all. Only for—

Mr. MACDONALD. Could I finish my question?

Dr. HOLLOMON. I am sorry.

Mr. MACDONALD. Or would there be in each one of the States an institution and then regionally they would correlate the information?

Dr. HOLLOMON. That is correct.

Mr. MACDONALD. Is that the function of the region?

Dr. HOLLOMON. Yes; that is one function of the region.

Mr. MACDONALD. And each time the region appears here in the bill it does so in that frame of reference?

Dr. HOLLOMON. Yes, sir.

Mr. MACDONALD. As a clearinghouse, not as a representative to gather the information—

Dr. HOLLOMON. Right.

Mr. MACDONALD (continuing). For each State. Am I correct.

Dr. HOLLOMON. That is correct, depending on the agreement. This would be purely voluntary on the part of the State Governors.

Mr. HARRIS. Now, just two other points that I would like to mention: No. 1 has to do with the planning program. As I understand, this would authorize you, Mr. Secretary, with the proper application before you, to approve \$25,000 a year for not to exceed 3 years to each designated institution to assist in the preparation of a program. Does that mean that each institution that would like to participate in this would be permitted to develop plans by that institution?

Secretary CONNOR. No, sir. It does mean that for each of the 50 States, the Governor could designate one institution or State agency and that agency or institution would then make application to the Secretary of Commerce for \$25,000 per year, not exceeding 3 years on a nonmatching basis, to provide the initial plan.

Mr. HARRIS. I would like to call your attention that in this particular provision you do not mention "and/or agency." You said "designated institution."

Secretary CONNOR. I use the expression as it is defined in the bill in section 2(b).

"Designated institution" means the institution or agency in each participating State which has been designated as administrator of the program * * *.

Mr. HARRIS. I see. In other words, each State could receive for its purpose, without matching, \$25,000 a year for a period not to exceed 3 years.

Secretary CONNOR. Yes, sir; that is correct.

Mr. HARRIS. And that is for planning purposes only.

Secretary CONNOR. Yes, sir; to get it started.

Mr. HARRIS. Now, it seems to me you have stressed 5-year plans in here.

Secretary CONNOR. Yes, sir. The bill is drafted on the assumption that 5 years would be a reasonable period for the initial preparation of the plan, for the inclusion of the participating institutions, and then carrying forward the plan. It provides time for a review by a disinterested advisory group to see whether the program is worth continuing in its then present form or whether changes should be made.

Mr. HARRIS. Well, I just wondered if it would not be better to have the program—it seems like this is sort of a trial-and-error thing anyway at the present time—I don't think it could be considered visionary as such, and I think it is a practical approach, but I am just wondering whether it would not be better if we could provide a 3-year program and get it underway and have an opportunity to see how these institutions are going to react to it, how the States are going to cooperate with it and develop the program prior to going into a program that would, well, be, I suppose, definite and where they could evolve into something that would turn out to be something other than the purpose of this bill.

Secretary CONNOR. Well, Mr. Harris—

Mr. HARRIS. I would feel much better about it from my own personal viewpoint if we could do that. We have on this committee adopted, I might say to you, somewhat of a pattern on these programs of 3 years and then review. We have done that on several. One reason we did is because two or three programs got completely out of hand. It was not intended that they be plummeted into the kind of situation that we find today. So this committee decided that it would be a lot better for the programs and for the country if we took a look after 3 years to see how we are getting along.

Secretary CONNOR. Chairman Harris—

Mr. HARRIS. We adopted a program 2 years ago of the medical assistance program, medical and dental program. Now we are coming back for an extension to that program. Now we have an opportunity to see how it is getting along. I understand it is doing very well and I think there is going to be more enthusiasm generated for it. We are going to start hearings on the extension of that program June 10 of this year. Of course, it has another year to run but there is some technicality about it that makes it necessary to have a review now. We find a lot of reaction to it that is highly favorable, where if we had let the thing go along by itself, the first thing you know, it would have gotten way out of hand and I don't believe we would have the strength that we have in it now. I just wondered if we might not be better off if we didn't approach this this way.

Secretary CONNOR. Chairman Harris, I think in most situations this point of view is completely sound. The problem here is that for its administration, the program depends upon actions taken in all 50 States. With many State legislatures meeting only once every 2 years, and with some States finding this a new concept, our estimate

is that it will take a period of time for this program to get fully underway. Thus it differs considerably from a program that is administered by a Federal Government agency. This is why we are recommending this longer period of time.

Mr. SPRINGER. Mr. Chairman, would you yield?

Mr. HARRIS. Yes, indeed.

Mr. SPRINGER. Mr. Secretary, have you or Mr. Hollomon given thought to how long you think it would be before the States did implement this program?

Secretary CONNOR. All 50 States, if they are so inclined?

Mr. SPRINGER. Yes. I think this is rather important for the committee to know that if you have an opinion.

Dr. HOLLOWOM. It is our guess that it would take approximately 3 years. By the fourth year all of the States will have had opportunity to organize a full program.

Mr. SPRINGER. How many do you think would implement it within a year?

Dr. HOLLOWOM. A guess, Mr. Springer. My guess is something of the order of 10 to 15 within the first year. Perhaps more.

Mr. SPRINGER. Two more years to get in the remaining 35, so to speak?

Dr. HOLLOWOM. Right. I think it is very desirable to have the program subject to review. In this case in which the States have to take some action and an agency or institution has to be appointed, my own feeling is that a 5-year review might be more effective, but, of course, this is something for the committee to consider.

Mr. SPRINGER. Thank you, Mr. Chairman.

Mr. HARRIS. I just have a feeling that we might be better off and develop a better program by working together and keeping everybody informed as it develops and progresses.

Dr. HOLLOWOM. I do, too, sir.

Mr. HARRIS. If it looks like in a couple of years from now it is going much faster than you had ever anticipated, that then would be the time to bring all forces in with the information about how it is getting along. I would be interested in the comments of some of these people representing the institutions and the States as we go along with the hearings, but right now I just have a feeling that we might be better off to approach it in this way. I would like you to think about it any way.

Secretary CONNOR. Thank you very much. We shall do so.

Dr. HOLLOWOM. Thank you, Mr. Chairman.

Mr. HARRIS. I think that is all at this time, Mr. Chairman.

Thank you very much, Mr. Secretary.

Secretary CONNOR. Thank you.

Mr. SPRINGER. Mr. Chairman, may I ask a question?

Mr. MACDONALD. Mr. Springer.

Mr. SPRINGER. Mr. Secretary, if there has been any criticism of this, as I talked to the members who have tired to become acquainted with this bill, it is this overall feeling which I think the chairman has expressed very well, that there are parts of this bill which seem to be rather indefinite.

Now, when Mr. Hollomon briefed me on this in my office, I thought he did as good a job as he probably could just talking. A great more has come out here today which it seems to me is more favorable

to your cause than after I read the bill and after talking about Mr. Hollomon. I suppose that always comes as a result of hearings. But if there are any ways in which you think you could alter this bill to nail it down tighter, I think it would be extremely helpful.

Now, I think one of the problems that the chairman hasn't said to you, but certainly which has occurred to me, is that if we go to the floor with this bill, I can imagine a million questions are going to be asked on this bill; and to be frank with you, I don't know whether I could answer them all—that is, whether I can answer them all credibly so that at least my people would feel that this was the bill which justified itself. Now, if they could have heard the hearings here, they might have come to a different conclusion but this is the one problem as I read this bill which has bothered me more than anything else and I merely pass that along to you. But I think you felt a little bit of that here already today.

Secretary CONNOR. Yes. Congressman Springer, we are in this dilemma. We can get much more specific in dictating the kind of plans that a State would be limited to but we are fearful that if we do that, it will become a program of Federal dictation and not, therefore, responsive to the needs in the individual States. On the other hand, if we go through the procedure we have described and let a plan emerge from each of the 50 States, we recognize that these plans are going to differ markedly one from the other. We are unable at the moment to describe them except in general language and this raises the problem that you have put your finger on.

Mr. SPRINGER. Correct. Now, may I commend you for keeping this essentially in the hands of the States because I think it won't be of much help unless you do, but within those limitations, can you nail it down any tighter? I don't know—you can't say that today but this is something for your staff to think about.

Secretary CONNOR. We will take another look at it because we recognize this problem, sir. So thank you very much. We will look at it.

Mr. MACDONALD. In that vein, one of the things that I am sure will be of interest to our colleagues in the full House as it is to us here is your assertion that the bill represents in part a solution to longtime unemployment, national pockets of poverty, and so forth. Having read the bill and having had our discussions, I don't see really how this proposal would affect pockets of poverty or unemployment in general in any meaningful way. Could you elaborate as to how the Department feels it will go to the problem of unemployment?

Secretary CONNOR. Mr. Chairman, in quite a few parts of the country, the latest technological advances have not been put to use. As a result, using the illustration that Chairman Harris used recently, the places where this technology are in fact being used are pulling people from other States.

We think that if, within a State that has not fully used new technology, there is a program which results in improvement of the economic development potential of that State, the result will be the formation and growth of more businesses which will keep the skilled people at home in that State. This is our expectation.

Mr. MACDONALD. But isn't the other side of the coin utilized by another department of the executive branch, which reports that

technological improvements translated into the word "automation" is causing unemployment?

Secretary CONNOR. The extent of unemployment related to automation, of course, is a matter of considerable debate and concern. As we have pointed out in our testimony, even within a particular industry that is characterized by small businesses, the use of the technological information available varies widely from one company to another. Usually the companies that are making best use of the latest technical information are growing most rapidly and therefore become big companies whereas the ones not using this information stay small companies. So it is a broader problem than the automation problem as I see it.

Mr. MACDONALD. Well, I don't want you to feel that I am unsympathetic to the bill. I think as you said earlier it is a new approach and one that should be explored in any event, but I couldn't agree more with the chairman of our full committee in saying that it should be certainly subject to review if it doesn't work out in the way that the Department hopes that it will.

Secretary CONNOR. We agree with that concept. It is just a question of which period of time is most appropriate.

Mr. MACDONALD. This seems like a picayune question—

Mr. HARRIS. Would the gentleman yield there again? I think it is very important. Don't you think we could after, say, approximately 3 years, get the States and institutions, industry, and everyone enthusiastic, particularly in certain parts of the country, and then come back here, say, in about 3 years? Don't you think we could develop a much better program, have more information as to what we could utilize and how best it could be utilized?

Secretary CONNOR. My personal opinion, Mr. Chairman, is that you could do that at the end of 3 years.

Mr. HARRIS. What I am afraid of is, if you go to this thing for a period of 5 years, as you are talking about now, we run right into what Mr. Springer mentioned a moment ago. And that is a limitation that would be placed on it along with your planning and trying to accelerate it all at the same time. I am afraid it might handicap the program. It might discourage some of the States. It might discourage some of the institutions. You may not get as much enthusiastic support of it as you hoped and you feel now that you have.

Secretary CONNOR. I think there is a lot of sense in what you say. I think at the end of 3 years the experiences of the States that take the lead would be very valuable in pointing the way for the other States to follow.

Mr. MACDONALD. My last question, and I don't mean to get away from the broader aspects of this bill, but on page 9 you say:

A startling fact is that in 1963 the manufactured machinery which was exported from the United States to the European market averaged 50 percent higher in productivity than machinery installed domestically.

Now, why would that be?

Secretary CONNER. Dr. Hollomon is familiar with this specific situation.

Dr. HOLLOWON. This was as a result of the analysis of U.S. exports of various machine tools and machinery. It appears as if the Euro-

pean people particularly have demanded and gotten more productive machinery. This is simply a matter of the statistics on the type of machines exported.

Mr. MACDONALD. You mean to say that our American manufacturers when they ask for a machine are asking for less productive machinery than are the Europeans?

Dr. HOLLOWON. Apparently on the average that is the case.

Now, of course, that does not mean every company, but this is apparently what the export statistics indicate.

Mr. MACDONALD. Well, for my own information, since I will be dealing in this subject for awhile, who compiles these statistics and how are they compiled?

Dr. HOLLOWON. They are compiled by the Business and Defense Services Administration.

Mr. MACDONALD. Are there any further questions?

Mr. FARNSLEY. Mr. Secretary, your projects are the only two I know about, this one and the tourist thing, that probably have a hard way to go because they don't cost enough. You are proposing to spend money to make money. I hope you keep on this way. But I am a new boy in this town and I found out already unless it costs \$30 or \$40 million it has got no chance. Just be brave and keep it up.

Mr. MACDONALD. Mr. Secretary, on this very optimistic and happy note, I would just like to say thank you very much, and Mr. Hollowon, for appearing before us today.

Tomorrow the hearings will be resumed at 10 o'clock. They will be held in room 2218 at which time I understand we will be hearing from the universities and other private witnesses.

Secretary CONNOR. Thank you.

(The following letter was later received from Secretary Connor:)

THE SECRETARY OF COMMERCE,
Washington, D.C., June 14, 1965.

HON. OREN HARRIS,
Chairman, Interstate and Foreign Commerce Committee,
House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: At the recent hearings before your committee on our proposed State Technical Services Act, you raised some important and helpful points and requested that I consider them and respond to the committee.

You inquired whether it would not be desirable to limit the authorization for this program to 3 years, stating quite properly that it would be helpful for Congress to review the activities of the program after a reasonable period of initial experience. I would like to suggest a 5-year period of authorization rather than the shorter term of 3 years. As stated in our testimony to the committee, we believe many of the States will not be able to fully implement the program until at least the third year. Since our proposed program is based on an overall 5-year-plan approach by the States, I am fearful that if the initial congressional authorization for this program is only 3 years, the interest and commitment of the States to develop the best overall programs would be adversely affected. We must keep in mind that the States themselves will have to raise, either from public funds or private sources, at least half of the costs of their programs. Therefore, I hope you will favorably consider an authorization for a term of 5 years.

Another point you raised at our hearings related to the amount of appropriations to be authorized. No specific limit is contained in the administration bill. However, as we testified, we anticipate that the total expenditure over a 5-year period, assuming the gradual participation of all States, would not exceed \$140 million. Therefore, I suggest for your consideration that if you conclude a specific limit or authorization is desirable, this be set at \$140 million for the 5-year period.

I would like to say that we would have no objection if a provision were incorporated in the bill to require the Department to report annually to the Congress

on the program. It seems to me this would go far to achieve the objectives implicit in the suggestion that this authorization for the program be limited to 3 years. Further, the Department of Commerce would, of course, be happy to cooperate at any point during the term of the program in formal hearings before your committee concerning our experience and administration of the bill.

Another question which came up at our testimony related to the choices available to a State in selecting an agency or institution to plan its program. I believe this is fully answered by section 2(b) of the bill which defines the "designated institution" as the agency or institution in each participating State which has been designated by the State. In other words, the administration bill gives to each State full flexibility in choosing the planning agency for its program. The designated institution does not have to be a university or academic institution. It may be such an institution or it may be a nonacademic State agency.

I believe one other point brought out during the hearings was whether we could be more specific in describing the kind of programs that the States would carry out under this proposed legislation. Section 2(a) of the bill contains what we believe is appropriate statutory description of the kinds of activity that would comprise a State program. We do not believe it would be desirable to attempt to be more specific in the bill itself. We take this position because we believe that State officials should have sufficient flexibility to propose the exact activities most needed and most useful to their own State.

However, in an effort to clarify our own thinking as to the kinds of programs which we think would be suitable under this legislation, I am enclosing a description of the specific programs now in operation in four States on a modest scale. These are generally illustrative of the kinds of work which might be undertaken under this bill.

Thank you very much for your interest and help in connection with this proposed legislation. Please let me know if we can furnish any other information.

Sincerely yours,

JOHN T. CONNOR,
Secretary of Commerce.

GENERAL STATEMENT ABOUT EXISTING STATE PROGRAMS OF TECHNICAL ASSISTANCE TO INDUSTRY

The task of coupling advanced science and technology to industrial use is best undertaken by local institutions specifically charged with bringing new technology to bear on local industrial and economic problems.

There is considerable experience in industrially oriented programs from which to draw. About 28 States now operate university-industry programs of various kinds. All are small in comparison to the need and opportunity in their regions, but a few stand out because of their greater scope and effectiveness to date. Of these, four have been chosen for illustration. They represent four of the many different styles of operation which may be used, with equal effectiveness, in different regions. The programs described are only a partial list, and are included because they are comparable to the kinds of activities envisaged by the State technical service program.

Iowa

The Center for Industrial Research and Service at Iowa State University was established in July 1963, as a part of the university's college of engineering. The stated goal was to assist in the industrial growth of Iowa through the following three functions:

(a) Coordination of industrial needs with the technical capabilities and specialties available in the State and, particularly, those available through the staff and facilities of Iowa State University.

(b) Assist with special problems facing industries in Iowa by full-time staff assigned to work directly with the center.

(c) Publication of technological information from research and extension activities relating to the industrial climate and growth of Iowa.

During the past 18 months the following accomplishments can be noted:

(a) Over 1,500 calls have been made on Iowa industries.

(b) A wide variety of cases and problems, totaling over 460, have been handled.

(c) Most of the consulting firms and other professional groups in the State have been cataloged for reference, including:

1. Engineers.
2. Architects.

3. Patent attorneys.
4. Certified public accountants.
5. Testing laboratories.
6. Advertising agencies.
7. University professors.

(d) An information retrieval system has been put into use.

(e) Reports of completed research have been prepared on a number of subjects.

A summary of the 460 cases handled to date indicates the type of work being done. Fifty-six percent of the cases came from business firms and manufacturers, 32 percent from individuals, 8 percent from other Government agencies, 2 percent from development groups, and 2 percent came from trade associations and miscellaneous sources.

Georgia

The development division at the Georgia Institute of Technology was established in 1956 as part of the engineering experiment station, with a main office in Atlanta and field offices in other cities.

The overall goal of the division is to develop the natural, human, and man-made resources of Georgia and the Southeast. Operations cover several major fields including industrial technical services, manpower resource analysis, and industrial economic analysis. Areas of staff specialization include chemical engineering, civil engineering, electrical engineering, industrial engineering, management engineering, mechanical engineering, textile engineering, textile manufacturing, agricultural economics, area development, business administration, business education, chemistry, economic geology, economics, geography, industrial management, journalism, library science, marketing, and sociology.

A basic data unit provides research reference sources for the staff as well as for outside groups. In addition to these continuing activities, special studies of statewide resources and overall development problems are conducted periodically.

More than 250 major technical assistance projects for business and industrial firms have been completed by the industrial services staff and field office personnel. About 2,000 requests a year are received for information, and a backlog of 10 to 15 requests for technical assistance is not uncommon. These requests usually develop without direct solicitation. Recently, this program has been expanded under the auspices of the Associated Industries of Georgia, an association of most of the major industrial firms in the State.

Professional consulting firms in the area are kept fully informed of progress and activities through an advisory council which meets monthly with members of the institute staff. Without exception the response of consultants has been favorable.

North Carolina

The industrial extension service of the school of engineering at North Carolina State University was established by the State in 1955 to achieve a greater utilization of North Carolina's raw materials, and to develop its small industries.

The staff provides the following types of services, among others:

- (a) Technical studies, analyses, and assistance.
- (b) Industrial film library.
- (c) Information distribution.
- (d) Workshops and short courses.

Many of the requests for technical assistance are generated by small chemical producers.

Wisconsin

University of Wisconsin, university extension division, chairman, Mr. Paul J. Grogan.

The university extension division operates through the department of engineering of the University of Wisconsin. By far, the greatest effort is in the education extension area.

The northern Wisconsin development project staff has the following objectives:

- (1) To work closely with firms, providing management counsel on a continuing basis in specialized areas such as engineering, production methods, product development, finance, and marketing. These companies are chosen on the basis of growth potential, need for assistance, and management cooperation. Technical assistance is available from private and university consultants, University of Wisconsin extension specialists, and State and Federal specialists. An integral part of this objective is the "demonstration" concept, or the use of project findings to illustrate to other firms the growth

which can be realized by application of improved management and engineering methods.

(2) To provide short-term assistance to other firms and to economic development groups in northern Wisconsin.

(3) To provide an advisory and referral service aimed at interpreting the broad range of assistance available from the University of Wisconsin and approximate Federal and State agencies, as well as private sources.

(4) To encourage the development of local forms of permanent support for this type of service to the business community.

Mr. MACDONALD. The hearing will stand adjourned until 10 tomorrow.

(Whereupon, at 11:55 a.m., the committee was adjourned, to reconvene at 10 a.m., Wednesday, June 2, 1965.)

STATE TECHNICAL SERVICES ACT OF 1965

WEDNESDAY, JUNE 2, 1965

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON COMMERCE AND FINANCE
OF THE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to recess, at 10 a.m., in room 2218, Rayburn House Office Building, Hon. Torbert H. Macdonald (chairman of the subcommittee) presiding.

Mr. MACDONALD. The hearing will come to order.

The first witness today will be our very able and hardworking colleague from Florida, Mr. Claude Pepper.

STATEMENT OF HON. CLAUDE PEPPER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

Mr. PEPPER. Thank you Mr. Chairman and members of the committee. I want to take this opportunity to thank you and the other distinguished members of this committee for allowing me to take a few moments of your time to voice my support for the proposed Technical Services Act of 1965 which the committee is considering today.

I am one of a number of Members of the House who had introduced this legislation. I am in complete agreement with the stated purposes of this bill. It is vitally important that we make the fullest possible use of the technological knowledge arising from our massive postwar research and development efforts. The fullest use of this information is essential for the continued growth of our domestic economy, and it is even more important, if that is possible, to the maintenance of the competitive position of our goods in the world markets.

The ability to maintain an expanding volume of U.S. exports, in turn, is our main hope for eliminating our chronic balance-of-payments problem within a framework of freer trade, travel, and investment throughout the world.

If we look back to the period just before World War II, we find that the bulk of our Nation's research and development activity was both supported and performed by private enterprise. In 1940, Federal spending for research and development amounted to only \$74 million, or a little under 1 percent of total Federal spending. But, since then and especially since the middle 1950's, the Federal investment in research and development activities has mushroomed to a level of approximately \$15 billion a year, or 16 percent of the total Federal spending in the current fiscal year, fiscal year 1965.

Might I interpolate, Mr. Chairman and members of the committee, to say that I recall when we set up a resolution of the Congress which originated in the Senate on the National Cancer Institute in 1937.

At that time hardly anything was being spent by the Federal Government in the field of research in the area of cancer. The first appropriation was \$500,000 and that went ahead until 1946, when I, in the Senate, and former Senator Neeley, in the House, introduced a bill to appropriate \$100 million to remain available until spent, in the field of cancer research.

A year or so later we came up with the first Federal appropriation of about \$8 or \$9 million and the following year it went up to \$14 million.

Since that time it has continued to rise.

A little while after we had gotten the defense program underway, why, my attention was called by Mrs. Albert Lasker of New York, who has done so much in the health research field, to the fact that the Federal Government was spending only \$6,000 a year, as a total expenditure, in the whole field of research in heart and circulatory diseases which killed 1 out of 3 of our people and we started then a program to give some Federal funds. Mrs. Lasker and I brought the heart specialists for a hearing before the Senate Appropriations Committee. One million dollars were put in by the Senate Appropriations Committee by Senator Styles Bridges who was then chairman. The House reduced that to \$500,000. But that was the first substantial appropriation which was made in the field of heart research. Previously we had been appropriating only \$6,000 a year.

Some of those here, and your distinguished committee chairman, Mr. Harris, particularly, will recall just how relatively recently these Federal research programs have gotten underway and how great the expansion has been and how meaningful it is to the country, I believe, that we have them and how constantly and significantly helpful it has been in the field of research, both health and economic research, to have Federal participation.

Private research and development spending has also risen during this period.

According to estimates made recently by economists that the Battelle Memorial Institute, a highly respected midwestern scientific research organization, it is conservatively estimated that privately supported R. & D. amounted to around \$5 billion in 1964. And it should be noted that much of our Federal support goes for research and development work performed in private industrial and university laboratories.

Nevertheless, it is obvious that the Federal Government now plays a dominant role in the research and development field, supporting close to 75 percent of our total national investment of \$20 billion a year, and that this gives the Federal Government a heavy responsibility for seeing that the fruits of this massive research effort are not wasted.

We have an obligation to see that the fullest use is made of the technological knowledge developed on this great investment in scientific and engineering labor.

I am very anxious that we do everything we can to insure the effective civilian utilization of the knowledge gained in the course of our space and defense research efforts. I am aware that both the

Department of Defense and the National Aeronautics Space Administration are actively promoting the spinoff of their technical developments for use in the civilian economy, but I think we must do more. I think we must do more to achieve a better regional dissemination of this information, and I think that we must do more to engage the active cooperation of our State governments, local committees, and industrial groups in the effort to make better use of this knowledge.

We are considering in this Congress a number of broad programs to encourage greater Federal, State, and local cooperation in such areas as medical care, transportation, pollution control, city planning, education, housing, and others. And in many of these programs we are giving special attention to assuring a better geographic distribution of the opportunities and advantages being generated.

We should approach this problem of the greater utilization of available technological knowledge in this same spirit—so that the boons of scientific discovery will be made available to the economic interests throughout our country, and will be made available to them through a program encouraging self-help and State and local initiative. I believe the program envisaged under the Technical Services Act of 1965 will contribute importantly toward this double objective of greater and more balanced economic growth throughout the country.

Now, Mr. Chairman, may I interpolate again. We know, of course, that knowledge is interrelated if not interdependent and that if knowledge is generated in one area, the chances are it will have an effect upon other areas.

Just for example take what the influence of World War II in the development of the small vehicle has been upon the development of small vehicles in other aspects of our economy.

I hope if I mention a personal incident you will not mind. When the first jeep was brought here to the Capitol, Senator Robert Reynolds of North Carolina was chairman of the Military Affairs Committee as it was then called, of the Senate and he and I got into that jeep and we rode up the steps of the Capitol from the White House direction, all bumping up and down those long steps. [Laughter.]

This is the first time I had ever seen an automobile, as it were, going up a flight of stairs and we were all out there looking at this new vehicle, the jeep which had come into use to serve, primarily, a military purpose.

Now we have every kind of little vehicle. This is just a very crude illustration of what research has done, primarily for military purposes, but at least in terms of potential value to other aspects of the community.

Mr. HARRIS. Is that the reason they are used by mail carriers also? [Laughter.]

Mr. PEPPER. Maybe so, maybe so.

I will just say this, too: You will agree, I am sure, that if we had had the little modern motorbikes when we were young, and riding bicycles, we would have saved a lot of pedaling. [Laughter.] In the State of Florida and its Third Congressional District, which I have the high privilege of representing, we have seen the economic benefits of new and expanding industry developing from a science-oriented base. Innovation and a high degree of technical efficiency are the hallmarks of the growing company, the company that pays better

wages, creates new products and new markets, and acts as a spur for community and national economic growth.

The Technical Services Act of 1965 can help more of our companies, especially our smaller businesses, become rapid growth, high efficiency operations. They can bring our university scientists and engineers, our economic development groups, and our industry groups into closer cooperation for the benefit of every State and the Nation as a whole.

In addition to what this program can contribute to our domestic well-being, to a rising prosperity for our people, and better earnings for our business enterprises, its contribution to our overall national efficiency can be extremely important in the areas of foreign trade and national security.

A more efficient economy can enable us to sell more goods in increasingly competitive world markets. It can enable us to make a larger contribution out of our rapidly expanding economy for the development of less fortunate nations throughout the world. And in any international crisis it can give us a stronger industrial foundation for the defense of our liberties.

Mr. Chairman, it is my belief that the Technical Services Act of 1965, which was proposed by the President and which I and 13 other Members of the House are sponsoring, will make a far-reaching contribution to our national prosperity, security, and progress far exceeding its costs.

This committee is to be highly commended for acting so promptly in scheduling hearings on this very important matter. It is my hope that the committee, following careful study of the bill, will see fit to recommend its approval, and that the Congress will take affirmative action at the earliest possible date.

Our Nation has benefited immensely from the technological revolutions of the past. This program will give us greater assurance that we will continue to advance on the broadest technological base in the years to come.

Thank you very much.

Mr. MACDONALD. Thank you, Mr. Pepper.

Mr. PEPPER. I would only add, Mr. Chairman and members of the committee, that basically what this legislation proposes to do is to bring about a closer relationship between those who are generating this great mass of knowledge and those who are engaged in the business of the application of that knowledge in practical ways in various aspects of our economy in our country. I would like to thank you very much, Mr. Chairman, and members of the committee, for the privilege of being here.

Mr. MACDONALD. Thank you, Mr. Pepper. We have certainly enjoyed your appearance here today and I congratulate you on your statement.

Mr. PEPPER. Thank you.

Mr. MACDONALD. Are there any questions of the gentleman from Florida?

Mr. HARRIS. Mr. Chairman, I want to say that I am glad to be here during the presentation of our colleague from Florida. I am sorry I won't be able to stay for the presentation of our colleague from Colorado.

Mr. PEPPER. Mr. Chairman, may I be permitted to say that the distinguished chairman of the main committee, the parent committee,

has done, if not more than anybody in the Congress, certainly as much as anybody in the Congress to broaden the frontiers of knowledge in all aspects of research and I want to take this opportunity to commend him for the leadership that he has given.

Mr. HARRIS. Thank you very much. I would add to my colleague that I do have some pride in the fact that I participated in the establishment of the National Science Foundation, back in the early forties—I had forgotten how long ago it was.

Mr. PEPPER. I remember that.

Mr. HARRIS. But we all know the tremendous contribution that it has made to the welfare of the Nation and of the world so I cannot help but have a little pride and a lot of satisfaction out of the small contribution I made to that program. For various reasons I am very happy about some of the things that we have achieved in this committee with the help of many others, including members like the gentleman from Florida, and what we hope to be able to achieve through the efforts of this committee.

I, as chairman, could stay in this committee for a long while but I want to get this man at a meeting of the Rules Committee. [Laughter.]

We have got a rule we are seeking so I have to take him with me over there.

Let me just say what you have seen here this morning is some indication of the reason why the University of Arkansas sought him out as a professor of law back in the days I am not going to mention [laughter] although he is older than I am, but it is before I got out of school.

Mr. PEPPER. 1924 and 1925—that was one of the happiest experiences of my life.

Mr. MACDONALD. Thank you very much, Mr. Pepper.

Mr. HARRIS. Is Dr. Caldwell here?

Dr. CALDWELL. Yes.

Mr. HARRIS. I want to take the opportunity to say hello before I leave and to some others who may be here. I hope I will be back later, Mr. Chairman, if I am able to.

Mr. MACDONALD. Fine, Mr. Chairman.

Is the Honorable Roy H. McVicker from Colorado here?

Mr. McVicker, we will be glad to hear you at this time.

STATEMENT OF HON. ROY H. McVICKER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF COLORADO

Mr. McVICKER. Mr. Chairman, it is indeed a great honor and pleasure that I appear today to testify on behalf of my bill, H.R. 7335, designed to promote economic growth by supporting State and regional centers to place the findings of science usefully in the hands of American enterprise.

This bill would permit the Federal Government to join with State governments, universities, and local industry in stimulating the industrial and economic growth of States and regions in the Nation through the application of science and technology.

The bill is addressed to the economic problems about which we read every day—long-term unemployment, regional pockets of poverty, industries which are losing their competitive positions, and

increasing foreign competition in both domestic and world markets. These problems point to the increasing need for developing mechanisms to bring the latest developments in technology into the production lines and plants of our local industry.

Just as the problems are local, so should be their solution. This would establish mechanisms concentrated on the local level, utilizing local leadership, local initiative, local resources, and local participation. Federal funds, on a matching basis, would be used to encourage the establishment or expansion of local institutions specifically destined to meet the needs of the local economy.

A State wishing to participate in the program would designate an institution, either a State university or agency, to administer and coordinate the State's technical services program. This institution would prepare a 5-year plan, outlining the technological and economic situation in the State, the major regional and industrial problems, and the means to be used in assisting in their solution. The institution would also prepare an annual technical services program, including the objectives for the first year, the budget, and the responsibilities assigned to each qualified institution participating in the program.

The 5-year plan and the annual program would be submitted to the Secretary of Commerce. Federal matching funds would be made available to the designated institution to support eligible programs. The Secretary of Commerce would establish a formula designating the maximum annual Federal payment, taking the following criteria into consideration: (1) population, (2) level of industrial and economic development and productive efficiency, and (3) technical resources.

His formula will be weighted to provide funds to States and regions where industrial development has lagged behind its potential and where technical resources are weak. The population criteria will be applied in a manner which will permit even the smallest and least populous States to participate in a meaningful and profitable program.

There are a variety of effective programs of university-industry cooperation in operation in 28 States at the present time. One especially notable program is conducted under the auspices of the Denver Research Institute, an integral part of the University of Denver which engages in sponsored research for Government and industry. This institute offers ample evidence of the potential effectiveness of programs that the subcommittee is now considering. To stimulate the process of technology transfer, the DRI has developed a highly motivated staff of engineer-economists, engaged in effectively interpreting the significance of scientific and technological advancements to the commercial entrepreneur. These economists are studying new techniques for coupling technological innovations with potential users in industry, thereby providing the bridge between the generation of advanced technology and its use in technologically oriented as well as underdeveloped industries. In addition, these men are carrying out fundamental research on the processes by which technology is diffused and applied, seeking new ways to accelerate the transfer of knowledge into use.

The Denver Research Institute consists of seven operating divisions: chemistry, electronics, electromagnetic propagation, industrial economics, mechanics, metallurgy, and physics. Research interests in these divisions cover a complete spectrum from basic investigations

to directed developmental efforts. A number of large research programs are also conducted by the institute outside the divisional structure.

But such programs, effective as they are, are still small in comparison to the need and opportunity in their regions. If we are to promote our economic growth to the fullest possible extent; if we are to achieve and sustain a high level of employment throughout our Nation; and if we are to improve our competitive position in world trade—the hiatus between the technological developments in our laboratories and their application in our industries must be erased. I believe this bill will accomplish much toward the end of nurturing our economic growth and prosperity.

Mr. MACDONALD. Are there any questions? If not, we thank you for your appearance, Mr. McVicker.

Mr. McVICKER. Thank you, Mr. Chairman.

Mr. MACDONALD. The next witness is Mr. John C. Calhoun, Jr., vice chancellor for programs at the Texas A. & M. University, College Station, Tex.

STATEMENT OF JOHN C. CALHOUN, JR., VICE CHANCELLOR FOR PROGRAMS, TEXAS A. & M. UNIVERSITY, COLLEGE STATION, TEX.

Mr. CALHOUN. Mr. Chairman, I have a prepared statement which I believe the clerk has distributed to you, and I will highlight certain points. It is a pleasure, Mr. Chairman and members of the committee, to appear before you today to speak on behalf of H.R. 3420 the State Technical Services Act of 1965.

My name is John C. Calhoun, Jr. My home is in College Station, Tex. I am vice chancellor for programs at the Texas A. & M. University system, which is the land-grant university for the State of Texas. The institution for which I work has a number of programs in the area covered by this bill, some of which I will describe, but I wish to emphasize, I do not appear here on behalf of that institution. The comments which I express and the recommendations which I make are a matter of personal analysis and opinion.

I have taught university engineering courses from the sophomore through the graduate level, have supervised research projects, and have taught continuing education courses. Experience as a department head, as a dean of engineering, as a director of an engineering experiment station, and as a director of an engineering extension service have brought me in contact with both opportunities and problems in the advance and use of technology. In a consulting capacity with a number of industries, I have dealt with the problem of updating personnel. Recently, as president of the Society of Petroleum Engineers of AIME, I initiated a study on continuing education to examine the need of members of this professional society for maintaining their professional quality through current awareness of advances in technology.

It is from this general background that I offer my comments this morning about the proposed State Technical Services Act of 1965.

I believe this proposed legislation is needed, and I recommend to you that you give favorable consideration to its enactment. It will

provide the stimulus for a general advancement in technology that will not come about in any other way.

First, I would like to give you some of the general reasons why I am in favor of this legislation. Second, I want to indicate a few things I think could be done in Texas, based on the programs that I now see in operation. And, finally, I will make a few suggestions for improvement in the details of the proposed act.

Our Nation is making a considerable investment in research and it is important that this investment pay dividends. The realization of benefits through the use of research findings is not, however, an automatic process. It is necessary that we apply efforts to the job of using new knowledge.

Research has actually become an industry of its own and is carried on most efficiently on a large scale in highly organized programs. The individual research man is still the key to much of our advancement but his environment is more and more tied to a research team.

In addition, the execution of sophisticated research requires rather complex and sometimes very sophisticated apparatus or access to special environments such as those of the atomic nucleus, the ocean, or the atmosphere. The individual researcher or the small research organization find it difficult to maintain the spectrum of tools and specialties to make research fruitful.

These changes make research itself more efficient, and allow the research worker to be highly creative and motivated. These forces at the same time have a tendency to isolate research from its ultimate application. Research can now sustain its own internal growth as an end unto itself. Its full use in our day-to-day industrial world will not be achieved unless we specifically give attention to the matter.

There is also a critical size that is an important consideration to the conduct of research. The large corporation will be able to sustain its own research organization with the necessary breadth for it to be vital. The small company cannot. This sharp distinction between those industries of sufficient size to carry on their own research activity and those that cannot leads us to a very real situation of have versus have not industries. The latter must look to sources outside their own organizations for technological stimulation.

It is important that the bridge from research activity to applications and use of technology in private enterprise be narrowed rather than widened. Our attention to the flow of information from a basic research investment to utilization has been primarily from the academic research field into the graduate student program; from federally supported contract and national laboratory research into Federal programs; from the large industrial and corporate laboratory into the large corporate business. There is essentially no bridge to carry research information from the academic or Government laboratory to the small industry or to the isolated individual engineer.

The little that is done has been generated through some of the State engineering experiment stations and the not-for-profit research foundations working in localized areas on localized subjects.

In my opinion a larger part of our economic activity and organized technology exists in smaller units than we ordinarily realize. A large number of companies are not only too small to have research organizations, but are too small indeed to have engineers or professional technological employees of any type. There are also many

examples of individuals who make poor or ill-advised investments that never get off the ground because they are isolated from technology. Industrial development is more and more related to what comes out of the research laboratory and to the advances that we make therein. In addition, many individual engineers, some of them employed by large companies, work in isolated places where they do not have an opportunity to stay up with the main stream of technological events.

In Texas there is a group of public institutions also that are in need, in my opinion, Mr. Chairman, of technological information.

In Texas, for example, there are 11,000 industries that do manufacturing of some sort. At least 80 percent of these have less than 500 employees. In other words, they are classified as small businesses.

In Texas also, we have 431 cities over 2,500 in population. Of these, 410 are in the category of 2,500 to 50,000 people. Only 21 are 50,000 or over, a size that gets to the point where the community can muster their own technological advice.

Even among the highly organized professions such as that of petroleum engineering with which I am most familiar, there are a large percentage of individuals who are in relatively isolated situations. A survey done for the Society of Petroleum Engineers last year showed that 26 percent were employed at locations more than 50 miles from a university and, presumably, from an opportunity to undertake continuing education, and over 50 percent were more than 50 miles away from a university with a department of petroleum engineering—that is to say, the field of technology of their specific interest.

Twenty percent of those in this profession were employed over 40 miles away from the nearest location where a professional group of their cohorts would hold periodic meetings. This distribution is in spite of the fact that the petroleum industry has a relatively high percentage of large corporations and highly organized research laboratories.

The picture that I am portraying is of a research activity which has become highly organized and highly sophisticated and which, because of its nature, must be carried on in large groupings with an internal rather than an external orientation. On the other hand, a surprisingly large number of small industry units, of individual professionals, and of organized municipalities not only do not have research organizations but have little technological capacity to identify their needs. They have no access to research findings other than those they stumble upon. The situation, in fact, is not too unlike the regional imbalances that exist in our national growth.

I do not see any existing agencies, either Federal or local, that are directed to alleviate this specific problem; namely, the absence of a bridge between our growing research investment with its body of technological knowledge and our small industries, our isolated individual professional, or our municipalities struggling with our technological age.

There has been much talk about continuing education for the individual engineer over the last 10 or 15 years and there has been a general recognition that the individual engineer is not keeping up. There has not been a parallel attention paid to the equivalent lag on the part of the small industry or the small community and to the fact that they are not keeping up.

We need, first, to recognize this problem.

Then, we need an agency or machinery to focus on the problem and consolidate the individual efforts that have sprung up within the States. Along with this focusing machinery we need to provide stimulation for the small businessman, the small community, and the individual engineer to help themselves. They need to be provided, however, with analytical help and with the background material necessary for them to identify where they stand, how far they lag behind the best current knowledge and what is available for them to maintain pace with the rest of technology. Not the least of the requirements is the necessity for planning and prediction. Many of the small industries now going on a year-to-year basis have no idea at all how they may have to change in order to be in business 5 years hence.

I see the State Technical Services Act, therefore, as being directed toward filling these kinds of needs.

Now, let me tell you a little about some of our programs at Texas A. & M. University and what I see as some specific areas for which we could use additional assistance.

The Texas Engineering Experiment Station, Texas Transportation Institute, Texas Engineering Extension Service, the Texas Engineers Library, and Texas A. & M. University Office of Continuing Education are all engaged in the types of activities outlined as technical services in the proposed legislation. Let me point out that each one of these, however, is engaged in a very small fraction of what is covered in this legislation. Our funds are limited and we have not been able to carry on these programs covered in the legislation at the intensity needed, or on a total geographical coverage basis.

Our industrial economics research division has been doing area development studies, marketing research studies, and industry analysis for a number of years. This staff of 6 full-time researchers and a technical librarian, during the past 2 years, have done area developmental program studies for 10 small Texas communities and have carried on 1 regional study composed of 5 counties. During the same period they have also conducted 8 major marketing research projects for industrial firms in Texas and have answered more than 100 individual inquiries pertaining to market information.

This program operates on an annual budget of \$75,000, of which about \$10,000 is State funds, seed money, so to speak, and the remainder is paid in by industries, communities and individuals who make use of the program.

One of the big deficiencies in this program is that it is almost impossible to undertake regional studies. There are no logical sponsors for regional studies. Cities will support economics research into their own community economic base, but they will not very often give support to the analysis of a region. There are 14 economic regions in Texas identified by Federal agencies and it would be very desirable to undertake basic research studies of the economic attributes of each of these regions.

This kind of program that is carried on by this economic survey system tells what technological and resource base there is to work from if one wishes to stimulate new or existing industry.

The Texas Engineering Extension Service specializes in extension programs and special courses, and this is a different kind of program,

directed at bringing the latest technological information to the attention of working industrial people. This spring, for example, the service initiated four new programs: industrial radiography, telephone technology, electronics and project managing for mechanical contractors. These courses are using the latest technological changes which we can work into the course including nuclear and computing, techniques. Approximately 14,000 persons enroll each year in training programs and short unit courses conducted by the engineering extension service, and of these about one-third are already employed in Texas industry. Our major limiting factor here is lack of funds to organize new reference and instructional material. And, incidentally, of this program about one-third of the funds are State-appropriated funds and about two-thirds are generated from fees and charges made to the participants.

The Texas Engineers Library for years was the focus of engineering reference work of professional engineers in Texas. Unfortunately, lack of funds have required that this unit be terminated. Special requests for library searches and bibliographies from practicing engineers of Texas were handled through this library, but it has been inactive for about 6 years. It should be resumed and this is one of the things we would like to do.

Since 1953, all literature search as needed by the Texas Highway Department has been conducted at Texas A. & M. by the librarian of the Texas Transportation Institute. This particular function is supported by the highway department. This is an example of what can be done if you know that there are the means to do it.

One of the more dominant programs that has contributed immensely to the application of new science and engineering to Texas industry and public service institutions in recent years has been our data processing center. Through its special courses, computer tapes, reports and individual relationships with industries, a large input has been made to the advancement of industrial technological competency. To date, however, this has been localized to those groups who have seen the need and have been willing to support the activity. There is no general support available.

The many short courses and conferences which have been carried on through our office of continuing education during the past 12 months include a protective relay engineers conference, a process industry instrumentation conference, a water and sewage course, a traffic engineers conference, a highway engineers course, and a special course in reservoir engineering and well drilling, respectively. These particular conferences and courses are directed especially to the transfer of new science and engineering to operating personnel, most of whom are engineers or engineering technicians.

One of the biggest drawbacks to the dissemination of advanced technological knowledge through these seminars and conferences is the large effort to initiate a program. It takes much more to put the program in orbit than to keep it going. Many times a needed program doesn't get off the ground simply because the stimuli cannot be focused nor available time and funds diverted from existing programs to launch the new program. One of our greatest needs in this respect is for individuals who can do analytical work on given subject matter areas, condense the appropriate material into up-to-date programs, and organize the format to make this information available to industrial groups.

It is also very difficult at the present to survey the existing level of a technology as it is practiced within a given industry. For example, one could ask: "What level of chemical engineering technology is now in use by the smaller refineries throughout the State of Texas?" This question cannot be answered until a survey is undertaken. At the moment we have no funds to undertake such surveys and to the best of my knowledge, such funds are generally lacking throughout the Nation. This applies to all areas of technology.

In short, I say that our society seems to take the position that it is up to the individual engineer or the individual small industrialist, or the individual small municipality, to seek out their own salvation. In most instances, however, these people do not know where to start. Generally, they don't know how far behind they are. One of the first tasks we face therefore is to establish some method and means by which individual small industries, engineers, or cities can measure their own technological standing. This is one of the things we would embark upon in Texas.

One of the small businessman's problems when he knows that he needs help is where should he go once he knows this. There are no organized technological clinics to which the small industry can appeal for aid. We need organized, talented groups on a State or regional basis to analyze given industries and given technologies to determine the actual state of the art and the particular impacts upon this which will produce change. We have not applied our analytical ability to learn where our technological illnesses exist and what we may do about them. This is another thing we would like to do in Texas.

Consequently, in our State I believe we would not only be ready to undertake the creation of a State plan, but I would propose a few specific programs. First, I would emphasize studies that look at regions instead of individual cities in order to evaluate the available industrial base and resource base. Second, I would propose surveys and analyses of the state of technology as it is currently practiced, and an evaluation of the gap between current practice and the best level of knowledge. And third, I would support the establishment of analytical teams and groups to do the background work and to organize programs so that both the small industrialist and the individual technologist would be stimulated to seek assistance.

Finally, let me comment on a few changes that I would suggest in the act itself. I believe these suggestions will improve the act although I emphasize, I do not think they are critical.

In the first place, I think its purposes ought to be broadened so as to include placing the findings of science usefully in the hands of American civic and public service institutions as well as in the hands of industry.

In the second place, I would delete the last sentence of section 2(c)(2) so that the Commissioner of Education will not embark upon the activity of accrediting educational programs.

Third, I would limit the formula basis for determining allotments to States to (a) current population and (b) current industrial development.

Fourth, I would be more specific as to the naming of the "designated" institution in each State for preparation of a State plan. Either one particular institution in each State should be named or the choice should be placed in the hands of the Governor of each State.

In summary, Mr. Chairman, I believe this is a significant piece of proposed legislation and I urge your favorable consideration of it. I think we are ready to use the support effectively in Texas.

I thank you for the opportunity to make this statement.

Mr. MACDONALD. Thank you very much, sir, for a very fine presentation here today. As you were speaking a couple of thoughts came into my mind. You kept referring to the benefits that small communities would gain from this proposed bill.

Mr. CALHOUN. Yes.

Mr. MACDONALD. I have read and reread the reports about the bill and I don't quite follow the way in which a small community would benefit.

Mr. CALHOUN. Well, sir, I spoke about small communities because I think they, as well as the individual engineer and the small industry, are three "institutions" that are in the same position. This bill as it is now would cover the small community only indirectly—actually it wouldn't cover it as such.

Mr. MACDONALD. No.

Mr. CALHOUN. But I think it is all part of the same problem and I make the suggestion that the bill be broadened to include them.

I am not talking about social problems of the community. I am talking about technology as it is practiced in the community. The man who runs the sewage disposal plant, the water supply system, or the people who carry on street improvement programs and other matters that involve technology are all as much in need of being at the forefront of technological information as are the people in small industry.

Mr. MACDONALD. Well, don't you think, to speak in terms of a concrete instance and to use your example of the engineers who run certain types of municipal services, that such persons might have a particular journal and/or trade association through which they could exchange this information?

Mr. CALHOUN. Yes; many of them belong to the American Public Works Association, or they belong to the Society of Civil Engineers, or the American Institute of Architects or other professional groups. But the professional organizations working on these matters recognize the same kind of lag that I have pointed out and that is the reason that my own association went into the study of what could be done to upgrade the individual practicing engineer.

My own opinion, is that in general cities, particularly those of small size of 2,500 to 5,000, just really cannot afford to hire engineers; or maybe they can just hire no who has the job on a "firefighting basis." In other words, his total time is consumed in just taking care of the little day-to-day things that come up. It takes a lot of time to look after just those things that keep the average citizen satisfied without clobbering the administration. There is no group of really analytical people, however, available.

Mr. MACDONALD. Which administration are you talking about?
[Laughter.]

Mr. CALHOUN. The city administration.

Mr. MACDONALD. Oh.

Mr. CALHOUN. I think there is a real problem in the small community and whether this bill can cover it or not is up to you gentlemen. As it is presently written it does not.

Mr. MACDONALD. Well that is an interesting observation.

The second point I would like to raise with you is something that we were discussing yesterday with the Secretary of Commerce, and I don't know if any of you gentlemen were in the room or not.

Mr. CALHOUN. I was not.

Mr. MACDONALD. But I asked the Secretary a question about the natural rivalry that might come about if the Government were to appoint one university as being their agent in this field. We know of the great rivalry between Texas A. & M. and—

Mr. CALHOUN. And the University of Texas?

Mr. MACDONALD. Yes.

Mr. CALHOUN. Right; and the University of Houston and so on. All of these are publicly supported institutions, of course.

Mr. MACDONALD. They are all land-grant institutions.

Mr. CALHOUN. No; they are not all land grant but they are all publicly supported.

Mr. MACDONALD. Well, we have noted rivalry in that field—I have seen some of it myself, right on the field. [Laughter.] And very harsh [athletic] rivalry it is, too.

I must say it is to be commended from that point of view, but do you think that the bill as now written would tend to settle those rivalries or do you think that those rivalries would be strengthened because of the fact that the State governments would have to initiate such programs by appointing one of their number as the designated institution for purposes of this proposed act?

Mr. CALHOUN. No, I don't think this would increase any rivalry.

Mr. MACDONALD. Well, perhaps it would be impossible to increase it. [Laughter.]

Do you think this would have a divisive effect?

Mr. CALHOUN. No, sir, I don't think so at all. Those of us in educational work recognize that there is much more to do in our Nation and in our State and region than we can all do together, and we recognize that some institutions have attributes that others don't have. Whereas one institution will be foremost in a medical program another institution will be foremost in an engineering program.

Mr. MACDONALD. I take it that you feel Texas A. & M. would be foremost in an engineering approach?

Mr. CALHOUN. Well, I don't think that this is a fair conclusion. [Laughter.]

Mr. CALHOUN (continuing). To draw. I think that Texas A. & M. has a very good engineering program but there are other good engineering programs in Texas.

If you are asking me how I would proceed to designate these institutions, say in Texas, I would say that I would prefer to leave that up to the Governor or somebody else who made a good analysis of where the State plan could best be put together. I do not think that is evident at this time.

Mr. MACDONALD. Well, I agree with your conclusion that eventually it will come down to that, but with reference to the bill as now written, don't you feel that if one institution is going to be designated, no matter how self-sacrificing the other institutions might be, the others might feel slighted and therefore not be as cooperative, at least not quite as wholeheartedly?

Mr. CALHOUN. Oh, no, not at all. We don't feel a bit slighted when the University of Texas is designated to receive a program or grants from the Federal Government for a medical program because we realize—

Mr. MACDONALD. Yes, sir, but this is a little different if you follow what I am saying. In this instance, as I read the bill, somebody—a Federal czar as I am sure he would be known in Texas—[laughter]—would look over the educational institutions and say: "I designate institution A," for example, "as the foremost engineering school in Texas, to receive these funds."

Don't you think that this would bring an instinctive reaction from the other eligible institutions in Texas?

Mr. CALHOUN. Well, let me comment on it this way: In the first place I don't read this bill to the effect that a Federal agency would make a determination that a given university is the best engineering university. I hope that it would make a determination that a given university is in the best position to put together this plan and this would call for competence in various stages of engineering, an understanding of what is involved in research, in technology, and an understanding of what the total industrial situation is, and experience in working with industry and in carrying on continuing education courses, so that you would have to make more than an assessment of its engineering quality. You have to make an assessment, I hope, of the institution best qualified to carry on the plan. I think that if this determination were made on a good analytical basis there would be no divisive effects and I am sure that we would all be willing to work for the good of the State in this respect. But frankly, as far as I am concerned, although when it comes down to designating, I am always interested in seeing my institution up there in the front, I am more interested in seeing this job done for the State of Texas. I believe that all of our faculty and our people feel the same way.

Mr. MACDONALD. I hope you are correct. [Laughter.]

Mr. CALHOUN. I think we are.

Mr. MACDONALD. One other question: Yesterday, in discussion with the Secretary and his assistant I asked what a region was and the Secretary said "two States" would be the minimum region. Yet, I read in your statement here that there are 14 regions in Texas.

Now, I know that Texas is a big State, but [laughter] that does not quite jive with what was said yesterday.

Mr. CALHOUN. Well, Mr. Chairman, I think you can get many different definitions of a region. The definition that I gave you is that which I obtained from the people in charge of the economics research program who advised me that one of the Federal agencies has designated 14 economic regions in Texas.

Now I don't know on what basis.

It would seem to me that a region, in the terminology of this bill, will depend upon, particularly, technology. If one looks at technology from one point of view we are a single cohesive nation and technological community today—that is, our technological community is a national technological community at this time without regions.

However, one could look at certain small industries and you will find in a given area you have a group of electronic industries, for example, and in another area one might find a grouping of materials industries or metal-forming industries.

Again, if one is examining the state of the technological art one would have to identify regions differently.

I don't read "regions" in the sense that I would like to consider them as being predetermined by geographical boundaries, but rather determined by technological practices.

Under the terminology that I read in the act "regions" means more than one State but I simply was trying to tell you the problem as I see it in Texas.

Mr. MACDONALD. But you said "about 14 regions."

Mr. CALHOUN. That's right, as I see our problem in Texas.

Mr. MACDONALD. Well, wouldn't the region to include Texas, also be comprised of Oklahoma and the rest of the Southwestern States?

Mr. CALHOUN. Well, it depends.

Mr. MACDONALD. They have problems in common.

Mr. CALHOUN. It depends on what you are talking about.

Now, if we are talking about certain aspects, let us say, of petroleum production, then you might want to talk about the problem in relation to the entire Southwest. If you are talking about another kind of technological problem you might be talking simply about the Permian Basin which is essentially entirely within Texas.

However, if you are talking about another kind of problem having to do with flowing wells you would be talking about the gulf coast.

Mr. MACDONALD. Yes sir; but if you are just talking about petroleum, you would be talking about Saudi Arabia as well as Texas, wouldn't you?

Mr. CALHOUN. It depends on whether you are trying to improve technology as it is practiced and this is the intent of this particular act, as I see it, which is to stimulate the level of technology practice within America so that we will not only be better internally but better competitively speaking externally.

Mr. MACDONALD. Well, I guess that touches the heart of it. So that you feel that the "regional" concept has this as its purpose.

Mr. CALHOUN. Yes. I feel that the regional thing, as I read the bill, or as I interpret it, would mean more than one State. I probably should not have used the word "region" in talking about Texas, but I was simply trying to point out that one of the problems we have in carrying on our program is that to date we have only been able to deal with localized communities and one thing we want to do is deal with the problem on a broader level. We want to get support which we do not now have simply because you cannot pin down anybody who can see it on a "regional" basis.

Mr. MACDONALD. One last question—and I know other members of the committee want to ask you some questions—on page No. 12, you say that you would like to delete the last sentence of section 2(c)(2) so that the Commissioner would not get into the question of accrediting.

Mr. CALHOUN. Yes.

Mr. MACDONALD. As I understand it, you feel that the Commissioner of Education, Mr. Keppel, should not be doing that. But I want to point out this is what is actually being done right now by the professional and scientific groups.

Mr. CALHOUN. That is where I think it should be done but that is not the way I read that sentence.

Mr. MACDONALD. That is what the Secretary said yesterday; that is how it is being done now.

Mr. CALHOUN. Well, the way I read that sentence is that if the Secretary cannot find anybody who does this, then the Commissioner of Education would embark upon that phase; the accreditation, with a national advisory group.

Mr. MACDONALD. Well, I don't think that is correct. I feel this is a very important point, frankly, not just for this committee, but when we bring it to the floor I am sure many of our colleagues will want to comment on it.

Mr. CALHOUN. I don't have the bill in front of me but that is simply in accordance with my own reading of the sentence.

Mr. MACDONALD. Yes; but I think we should have this cleared up so that when you report to Congressman Teague, who is a very illustrious alumnus of your school—

Mr. CALHOUN. Thank you.

Mr. MACDONALD (continuing). That this won't be an issue.

Mr. CALHOUN. I now have the bill, Mr. Chairman, and on page No. 4 the sentence reads:

When the Commissioner determines that there is no nationally recognized accrediting agency or association qualified to accredit such programs, he shall publish a list of institutions he finds qualified after prior evaluation by an advisory committee, composed of persons he determines to be specially qualified to evaluate the training provided under such programs.

Mr. MACDONALD. Right.

Mr. CALHOUN. Now, this to me indicates that under certain conditions the Commissioner of Education would set up an Evaluation on Accrediting Committee, or whatever it might be.

Mr. MACDONALD. No, sir.

Mr. CALHOUN. That would have to go through the process.

Mr. MACDONALD. You are wrong.

Mr. CALHOUN. Well, OK. I am glad.

Mr. MACDONALD. I hope that you agree with me that you are wrong about it because it says "when the Commissioner determines that there is no nationally recognized accrediting agency" and of course that was already settled at the hearing yesterday when it was brought out that there were two engineering groups and also a business administration group.

Mr. CALHOUN. And of course there is the National Commission on Accrediting which looks at the whole accrediting activity.

Mr. MACDONALD. Well, wouldn't that take care of your objection then?

Mr. CALHOUN. Well, sir, the only point I want to make is this: If there is a nationally recognized accrediting agency or agencies, then this sentence has no meaning.

Mr. MACDONALD. Well, you are the expert in this field and I am asking you, because my knowledge in this particular area is basically limited to the testimony that was presented at the hearing yesterday.

Mr. CALHOUN. Well, there are accrediting agencies.

Mr. MACDONALD. In engineering?

Mr. CALHOUN. Yes, sir; the Engineers Council for Professional Development.

Mr. MACDONALD. Right.

Mr. CALHOUN. And there is also an accrediting agency for business programs.

Mr. MACDONALD. Right.

Mr. CALHOUN. And there is an accrediting agency for veterinary medicine, and for architecture, and so on. There are a whole lot of them.

Mr. MACDONALD. Right. And from the fact that these are already in existence, would that not cover your objection?

Mr. CALHOUN. I hope it would cover it, but there is the sentence in here and it says that under certain conditions the Commissioner of Education could set up an evaluation team. At least, that is the way I read it. Now, if I am assured that the Commissioner of Education will not get into the accrediting function then I am very happy, but all I see is the words in front of me. That was all I was reading—the words of the act.

Mr. MACDONALD. But the language on page 4 says that "where there is no nationally recognized accrediting agency" and in the two instances that you have brought up there are.

Mr. CALHOUN. Let us make my point clear.

Mr. MACDONALD. Yes.

Mr. CALHOUN. Whether there is or there is not, in my opinion I don't believe the Commissioner of Education should get into the evaluation or accrediting of programs and it seems to me this provides an opportunity for the Commissioner of Education to embark upon evaluation. I see no reason for it to be put in the act.

Mr. MACDONALD. Oh, yes sir, only in the absence of such an agency—

Mr. CALHOUN. Well I don't believe there is any absence. I believe it is covered.

Mr. MACDONALD. Well then, you withdraw your objection?

Mr. CALHOUN. Well, this sentence has no meaning. Either the sentence has no meaning, that is, it is not required to be in there because it is covered, or there is some aspect that is not covered and the Commissioner of Education will get into the accrediting.

Mr. MACDONALD. I don't follow you.

Mr. CALHOUN. Well, either accrediting is covered by other agencies or it is not covered. If it is covered then there is no point having that sentence in there. There is no need for it.

Mr. MACDONALD. Well, just say for example that there was an internal dispute in the Engineering Accrediting Agency and they dissolved themselves.

Mr. CALHOUN. All right, let's just suppose for the sake of argument that happens.

Mr. MACDONALD. This language would then cover it, would it not?

Mr. CALHOUN. Well, I won't press the point. But the way I read it, it seems to me that it would bring the Commissioner of education into the accrediting function.

If I am assured that this is not so and that the Commissioner of Education would not intend, or that the Department of Commerce would not intend anything of the sort, and that is not the way it should be interpreted here, then I am happy.

Mr. MACDONALD. It isn't, though. I am happy with you. [Laughter.] But the point is that it doesn't matter what your feelings are or my feelings—

Mr. CALHOUN. Right.

Mr. MACDONALD (continuing). If it is written into the law.

Mr. CALHOUN. Right.

Mr. MACDONALD. But you are protected here, and I would like to be sure that you will not go away to alert the Texas delegation, which is one of our largest in the Congress, that there is some sort of Federal control as to who would be accredited or not accredited.

We recognize that in the field of such specialists as engineering or business administration the people who do accrediting have done a fine job, and I am sure it is not the intent of those here or in the Congress as a whole to try to change that.

Mr. CALHOUN. I am pleased to know it is not the intent of this bill through that sentence to bring the Commissioner of Education into accreditation.

Mr. MACDONALD. But I don't want to go too far. I say that I believe, and I did not introduce the bill, but I believe that this sentence was introduced to cover any contingency if the association that does the accrediting for some reason, and let us hope that this does not arise, no longer could handle it.

Mr. CALHOUN. Well, let us hope that no such contingency develops.

Mr. MACDONALD. Excuse me?

Mr. CALHOUN. Let us hope no such contingency develops.

Mr. MACDONALD. Yes. Are there any questions from any of the other members?

Mr. HUOT. There was a point brought out yesterday and I believe it was discussed to some extent earlier. That is your fourth point that the designation should be a little more specific.

Now how would you feel about the agency of the State rather than the learning institutions—an agency like research and development?

Mr. CALHOUN. It is my personal opinion that the educational institutions are in the best position to put together these plans. I think they have the maximum knowledge as to what is the state of technology, as to what the directions of technology are and how they develop and as to what the procedures and methods should be that will best solve the problems. I believe that this State plan is more properly in the field of the educational institution than of any State agency.

Mr. HUOT. I would agree with that except that it was brought out that where there might be competition in a State it might solve the problem.

I am, however, concerned over the accreditation and the section that you were speaking about, No. 4, is only a protection sentence but on page 3, at the bottom, from line 21 on, there seems to be no problem where the accreditation agencies exist so this sentence that you are concerned about would not seem that it would have any occasion to be used except in the case of an emergency or some contingency such as has been referred to.

Mr. CALHOUN. I am willing to take the chairman's interpretation of that.

Mr. HUOT. We were so assured by the statement of the Secretary.

Mr. CALHOUN. Thank you.

Mr. HUOT. That is all, Mr. Chairman.

Mr. FARNSLEY. No questions, Mr. Chairman.

Mr. MACDONALD. Thank you very much.

The next witness is Mr. Sidney T. Maunder, visiting lecturer from the University of Massachusetts at Amherst, Mass. Before you begin, Mr. Maunder, I would like to say that we welcome you here.

Mr. MAUNDER. Thank you.

Mr. MACDONALD. Your reputation has preceded you.

Congressman Conte who introduced a similar bill has discussed the situation with me and has said that you were coming, informing me of your background. We are very happy to have you here.

Mr. MAUNDER. Thank you very much, Mr. Chairman.

**STATEMENT OF SYDNEY T. MAUNDER, ELECTRICAL ENGINEER,
VISITING LECTURER IN ELECTRICAL ENGINEERING, UNIVER-
SITY OF MASSACHUSETTS, AMHERST, MASS.**

Mr. MAUNDER. In introducing myself I would like to say that I am going to speak from different aspects from those heretofore. In general, I am going to speak about the subjects covered in my prepared statement.

I have been in General Electric, a large industry, for almost a lifetime. I was manager of engineering of a General Electric plant and I have designed and my engineering section has designed many pieces of electrical and electronic equipment and, as such, I have recognized the speed with which we can get the newest technical information.

Now that I have retired from General Electric and am a visiting professor at the University of Massachusetts, I see the slowness with which technical information gets into the hands of industry and into the final product.

Also, I speak to you today as a man who has talked with many industrialists in the Commonwealth of Massachusetts, from the big industries to the little companies of which the former man spoke, and I recognize many of their problems.

I speak to you in favor of this act and I ask your careful attention to it and your support of it.

This act will provide communication channels, faster communication channels, into the hands of, as I see it, the people who are able to use that information in the final product.

In the text that I have given you I use very homely and out-of-date illustrations. I particularly have one in mind. A little homely because you and I can understand it. Mother had a paring knife and it had a wooden handle. It was held on with two rivets; it was a wonderful tool. About 40 years ago, through the advent of plastic, we saw the paring knife come out with a plastic handle and it was a failure initially. It melted in hot water. Maybe my mother or my wife used hotter water than they should have, but here was a poor manufacturer changing from the wooden handle to the plastic handle. He thought he had made a step forward, but he made a step backward. Now, it took some time before they had corrected the trouble with the plastic handle.

I use that homely illustration because in most of our products there are many little items that go to make up the total product and if anything goes wrong in any element of that total product the product is no good.

As I state later in my text, there is a changing process and I also want to speak of this in a homely manner: I am going to talk about the painting of the product.

Most products except glass have to be painted for acceptance as a final product. How can this product be improved in a painting procedure? Well, obviously, we have gone away from the brush; we have gone to dipping or spraying. There is flow painting; there is electrostatic painting and with each of these new processes there are different elements. Which of these new processes shall we use in the product to improve it, to lower the cost, to make it more useful? Can we change the material at the same time that we change the process? Now, this is just one little process that I am speaking about but it is illustrative of many processes that go into making up the product.

At one time, in making electronic gear I had trouble with paint which I think illustrates this point very well so I put it in the text. The paint came off, flaked off some electronic gear. What was wrong? Didn't we degrease the unit before painting? Did we use the wrong element in the paint? Had we not dried it well enough? All these things were considered—what of the combination of things had gone wrong? Being a big organization we called in our next higher level which was a paint expert by career and he came down and he could not find out what was the trouble. But he went to the vendor's plant and they worked a day or two together and solved the difficulty.

How can this same thing be accomplished in a small company? How can they get technical help instantly? How can they get technical help in depth when it is needed? How can they get information from the people who know about this paint in my illustration and its application?

The next area I am going to talk about is "new products." As we read the financial reports of many, many manufacturing companies, the president or the chairman of the board is most happy to point out that 27 percent of the products the company is now making were not available 10 years ago. In other words, through science they have developed new products and because of technology, ability, and marketing skills these new products are available to the public which were not available to the public a decade or more ago.

How can we help in the development of new products?

Well, this goes to the area of technological climate.

I want to spend just a minute or two talking about technical climate because unless you understand it then you will not understand its implications.

Mr. Chairman, you and the former speaker were talking about a small community of an engineer or two; such engineers are in a technical climate all by themselves. Such a man has no one to talk to except, as was pointed out, at a regional meeting, perhaps, and I am using the wrong word here, but a regional technical meeting having technical climate which is the climate where engineers and physicists and scientists like to work. This is where they can get further education, where programs are provided in technical schools and where they can advance and improve their technical competence; and perhaps programs which lead to a doctor's degree may be undertaken.

This is the climate where there is rapport with other engineers.

Now, if you are an engineer in a small community, who can you talk to except yourself, and be in a technical sphere or in a technical-brotherhood basis? Rapport with other engineers helps to stimulate progress among each other.

Of course a technical climate is often made better by research facilities. If you are an engineer in a small plant and you have certain research facilities you may want at times bigger equipment which is not available to you but if one of your brother engineers in the same community and in a different plant has that facility there will be an exchange of uses of this equipment and of the art so that this makes a terrific technical climate. It is one thing that breeds new ideas—it breeds new products; it breeds a situation where the engineer will want to stay in that community and other industries may move into that community because they see it has a good technical climate.

It is one where, as you see a product, then you see a second level of the product, or another element of it that has never been developed and so a new industry may be born out of this technical climate.

Now here we have some of the things within the scope of the Small Business Administration, I realize, but new industries must be helped through the incubation period.

The industrialist will have a terrific community in which to produce a new product that he knows will sell in the millions across the country. He may have a lack of certain things and some of the small companies fail, to our regret, so how can the channels be kept open so that they may be helped before they reach a period where they are going to fail and so that the channels of communication between the education centers of the universities and industry can help them in this regard.

Mr. Chairman and gentlemen, I speak for several kinds of small industries and manufacturers of products; I speak for the University of Massachusetts in asking for support of this bill; I speak for myself as a citizen and a former man in industry.

I ask for your support.

Mr. MACDONALD. Thank you very much, Mr. Maunder.

(The prepared statement of Mr. Maunder follows:)

REMARKS BY SYDNEY T. MAUNDER, E.E., VISITING LECTURER IN ELECTRICAL ENGINEERING AT UNIVERSITY OF MASSACHUSETTS, AMHERST, MASS., JUNE 2, 1965

Gentlemen, I come before you to speak for H.R. 3420. I speak based on a varied background:

(a) I was manager of engineering of a General Electric plant and thus saw the speedy flow of technical knowledge in a large industrial company.

(b) I have talked with many industrialists, both of large and small companies, in the Commonwealth of Massachusetts and thus can relate some of their problems and tell you how the passage of this act would improve their operation.

(c) As an engineering professor, I see available technical information that is not being used to the fullest by industry.

Passage of this act will provide communication channels for the quick flow of technical information into local hands. These channels in some States are not now available. This bill will provide an impetus to the States to set up these channels. Specifically, I see the need for industrial seminars, workshops, demonstrations, and extension courses.

While the above are lecture-student relationships, yet there are other services in the reference area that should likewise be enlarged: Technical libraries, library searches, reports, microfilms, and information centers.

Let us look at several industrial situations and observe what could be accomplished if the entire country were set up under this act.

IMPROVE THE PRODUCT

To keep abreast of the market, each manufacturer must be constantly improving his product. What we are now making is constantly being made obsolete or non-competitive by advancing technologies. If the newer technologies are not made available to our industries, our products and businesses will slowly die. As an example, you and I have witnessed the advent of the stainless steel razor blade. This would have caused a loss of business if Gillette had not aggressively attacked the technical problems related to this innovation. So if a competitor makes an improvement and we do not, then the competitor will gain an important commercial advantage over us.

LOWER THE PRODUCT COST

Each aggressive manufacturer is striving not only for an improved product, but also for lower cost. Here I shall limit my discussion to the lowering of costs by product design change or change in material. Each element in the design of the product must be studied to see if new and lower cost materials cannot be used. If the product were a kitchen paring knife with the traditional wooden handle riveted in place, we would consider whether the handle could not be changed to a molded plastic handle. Will this handle warp in hot water? Will it be as sturdy as the ones our mothers used? Will it sell?

Extensive knowledge of the plastic materials and vendors is necessary to assure that the departure from the old to the new will be a reduction in cost without a sacrifice of product quality or impairment of sales appeal. Here is an area where experience of others who are experts is not only most helpful, but essential.

Further, it is recognized that when the costs are reduced, the product becomes more available to more people and, thus, the unit volume will increase.

IMPROVED PROCESSES

Changes in the manufacturing processes can, likewise, make an important improvement in the product or a reduction in the cost or a reduction in the manufacturing cycle. Consider a crude illustration: the painting of the final item. How can this be done quicker? Are ovens required for baking to speed up the manufacturing cycle, or can the product be air-dried? What new paint materials and technology will provide a chance to use a new process? Shall we air-dry, dip, or flow paint? What new modes of paint application are now developed that are practical and applicable to our product?

In this illustration, an industrywide workshop might be the best mode of conveying new solutions to old problems which are common to many companies.

NEW PRODUCTS

Some industries in their annual reports state that 30 to 50 percent of the production they are now making were not on the market 20 years ago. Our industries likewise can conceive of new products and how to make them if the technical climate is conducive toward such inventions. This climate is achieved if the men of the industry can be kept abreast of the latest technologies and of scientific discoveries which they might apply toward new products so that they might devise such new items.

As science advances, there are always new products coming into being. One must become aware of those products that fit into his own manufacturing or marketing pattern. Here is a place where a university can early point out the need for a new product to a specific manufacturer whose tools and skills fit this new item.

INDUSTRIES THAT ARE DYING

You have observed, personally, the death of many firms in your own area.

A textile firm, successful for 50 years, closed its doors because of antiquated machines, low prices, foreign competitors, the public desire for materials other than traditional woods, and higher labor costs. A papermaking plant closed because the machinery was antiquated; the building was too small for new machinery and the management misjudged the market.

If technical help had been available to the managements of either of these firms earlier, it is conceivable that they might not have closed their doors.

NEW INDUSTRIES

In the general case, a small group of people had an idea for a new product or service and started a company; but shortly thereafter, they had troubles which were due to some of these weaknesses:

- (a) Too little financing.
- (b) Unbalanced, technical, managerial, or entrepreneurial talents. It is recognized that if one element is weak or missing, success is difficult to attain.
- (c) Unwise service or production (it did not meet a need).
- (d) Immature use of funds and manpower.
- (e) Change in the competitive situation.
- (f) Product not fully developed.
- (g) Bad unbalance of raw materials or parts.
- (h) Marketing difficulties.

To help solve many of these difficulties, the new business had no one to turn to. Private consulting service is not available to help them; because, usually, the small firm has no funds to spend. However, as incipient new businesses, each State should do all it can to get them through their early times and troubles. Here free services from the campus should be made easily available to aid and guide them.

SMALL INDUSTRIES

In the Commonwealth of Massachusetts are 8,800 small industries, and most of these are profitable. In this group, business is good and increasing each year. Profit is fine, cash flow excellent and their aggressive management believes that it is on top of the competitive situation and that the plant has kept pace with technical improvements in machines, processes, and materials.

But often this is not the case, for management in its prosperity has been too smug and may have overlooked some aspects of the business; or in some instances, they need technical help which they cannot find and are unable to hire. Let me illustrate an imaginary case:

Parts of a product were glued together. The manufacturer depended on the vendors of the adhesive to supply that which would do the job best. However, to his dismay he found that his competitor's product was better because of a superior adhesive. To whom could he turn to for knowledge, in depth on adhesives, their application, and use? Research to find a better adhesive would take too long and cost too much. However, if there were an adhesive expert available to recommend a solution, their problem could be readily solved. Where is that expert to be found?

Small businesses are the backbone of our economy. We must do all possible to help them grow.

GOOD TECHNICAL CLIMATE

First, let me define "good technical climate." It is a small area where engineers, physicists and other technical people like to work because it presents specific advantages to them:

- (a) Further education. A good university with a top-grade college of engineering is a logical center of this area. It must provide evening courses leading perhaps to a doctor's degree.
- (b) Rapport with other engineers and technical people. This gives a stimulus between friends toward solution of problems and creation of new ideas or patents. These friends might not even be in the same companies.
- (c) Information centers on new processes or materials.
- (d) Research facilities over and beyond the scope of those in their own company.

If there is such an area of good technical climate, then this is likewise an area of stimulating technical growth; an area which does not lose its technical people; an area producing goods having a high technical content; and finally, an area of high economic growth.

Such an area, furthermore, will attract new industries and, likewise, will tend to keep the present industries from moving away.

OTHER WORLD AREAS

Some areas of the world and some States have learned how to use the new technologies effectively. They provide most formidable competition to those areas

where the use of technology is the least. Some States already have modest programs similar to that in this bill and some of these areas are already showing good economic growth.

ECONOMIC BENEFITS

This act will be a stimulus on each State legislature so that manpower can be made available to provide a proper channel of communication between the campus and industry. This in turn will provide improvement in the product and service so that the economic growth is advanced. As our product improves and our costs are lowered, our world competitive position will be improved.

CONCLUSION

The University of Massachusetts has already recognized the technical problem existing and has already committed some funds toward the end of helping the industries and thus lift our economic level. We are willing to increase this commitment.

As the designated spokesman for the University of Massachusetts on this act, I ask for your active support of this bill. Further, as a man from industry and from the faculty who has studied this act and its implications, I likewise ask your passage of this act.

Mr. MACDONALD: Any questions of Mr. Maunder?

Thank you very much, sir.

Our next speaker is Chancellor John T. Caldwell, of North Carolina State University, and I think he is accompanied by Dr. Brice Ratchford, dean of the University Extension, University of Missouri.

Mr. CALDWELL. Yes, sir; and two other persons.

Mr. MACDONALD. And Dr. J. Whitney Bunting, dean of the College of Business Administration, University of Georgia.

Mr. CALDWELL. He is not here.

Mr. MACDONALD. And Dr. Robert N. Faiman, dean of the College of Technology, University of New Hampshire?

Mr. CALDWELL. Yes, sir; that's right. And Dr. D. Mack Easton, dean of the Extension Division of the University of Colorado.

Mr. MACDONALD. Doctor Easton is here?

Mr. CALDWELL. Yes, sir.

Mr. MACDONALD. Is Dr. Barton A. Westerlund here with you?

Mr. CALDWELL. No; he is not here this morning.

Mr. MACDONALD. Would you all come forward. Is this going to be a joint presentation?

Mr. CALDWELL. Well, I am going to give the testimony and the other gentlemen will join me in answering the difficult questions that you may have. [Laughter.]

Mr. MACDONALD. You certainly have very wonderful geographical distribution.

Mr. CALDWELL. Yes, we do, New Hampshire, North Carolina, Missouri, and Colorado—that is pretty good.

Mr. MACDONALD. Right. You are all very welcome here this morning.

Mr. CALDWELL. And Mr. Chris Arnold, who is associate executive assistant for the Society of Land Grant Colleges, is also here.

Mr. MACDONALD. I would be happy to have him step up.

Mr. CALDWELL. Thank you.

STATEMENT OF CHANCELLOR JOHN T. CALDWELL, NORTH CAROLINA STATE UNIVERSITY; ACCOMPANIED BY DR. BRICE RATCHFORD, DEAN OF THE UNIVERSITY EXTENSION, UNIVERSITY OF MISSOURI; DR. ROBERT N. FAIMAN, DEAN OF THE COLLEGE OF TECHNOLOGY, UNIVERSITY OF NEW HAMPSHIRE; DR. D. MACK EASTON, DEAN OF THE EXTENSION DIVISION OF THE UNIVERSITY OF COLORADO; AND CHRIS ARNOLD, ASSOCIATE EXECUTIVE ASSISTANT FOR THE SOCIETY OF LAND GRANT COLLEGES

Mr. CALDWELL. I am John T. Caldwell, chancellor of the North Carolina State University at Raleigh, N.C. I am here today to present testimony on behalf of H.R. 3420, the Technical Services Act of 1965, on behalf of the National Association of State Universities and Land-Grant Colleges. This association has a membership of 97 major universities and colleges, at least one of which is located in each State and in Puerto Rico. As of last fall the total membership, all but two, being publicly controlled institutions, had a combined enrollment of 1,400,000 students, which is about 28 percent of the total enrollment in all American institutions of higher education. At the graduate level we grant more than 55 percent of all doctoral degrees.

The institutions I represent here today, Mr. Chairman, have for many years been interested in and concerned about the type of program that the Department of Commerce hopes to organize under the Technical Services Act of 1965. We very much appreciate therefore this opportunity to discuss with the members of this committee the proposed legislation.

Our interest in this type of program stems basically from the early acceptance by America's public universities of the ideal of faithful service to the needs of their communities and the Nation. It is in this insistence on the ideal of service that we can understand Justin Morrill's inclusion of the word "practical" and the famous phrase that he wrote into the act of 1862 which established the land-grant institutions over a hundred years ago:

* * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.

The public universities were to be useful institutions, useful to the people, to the States, and to the Nation.

That this concept of usefulness was to be extended beyond the campus and the classic disciplines, that is the ivy curtain between town and gown was to be torn down, was seen early in pioneering programs for agricultural research and extension. This priority was a logical choice for a country in which some three-fourths of the people were engaged in farming.

You will recall that the land-grant college act provided that there should be in each State a university the main point of which was to teach agriculture and the mechanical arts as we call them today.

The pioneering attempts of individual professors in individual institutions were formalized on a national level in 1887 with the passage of the Hatch Act for agricultural research and in 1914 with the passage of the Smith-Lever Act for agricultural extension.

I do not need to dwell on the effect of these programs on the economy and life of our country before this committee. By any measure, they furnish one of the greatest success stories of all times. Of all the details that could be cited in support of this statement, one seems to be able to summarize all the others by this particular statement: our farm population today totals just about the same as it did 100 years ago. In 1863 those farmers fed a population of a little more than 30 million people. Today they feed about 180 million—6 times as many—well enough to make weight control a necessary national preoccupation [laughter]. And I should add "surpluses."

Evaluated solely in the release of produced energies for other pursuits, these programs surely add up to the best investment our country has ever made. It also adds up to a measurable increase in productive efficiency greater than that achieved in other areas of the American economy.

The public institutions early attempted to extend these types of programs and services to other important areas of the national economy, and especially to those areas involving engineering and the industrial arts, within the limits of the available resources.

By 1914, 12 of these institutions had established engineering experiment stations and engineering extension services had been organized in many of them on an informal basis, as no funds were available. In 1905, as a result of insistent requests from small manufacturers for help, the first of several unsuccessful attempts to obtain Federal help for such programs was made with the McKinley bill calling for engineering experiment stations, following the pattern of the Hatch Act, for the agricultural experiment stations.

Despite inadequate financing, these early attempts at the local level, produced important results. Starting as early as 1894, a ceramic industry was started in Ohio as a result of pioneering efforts by Ohio State. North Carolina State achieved the same results a few years later in North Carolina. Penn State had organized industrial extension programs by 1907, including the public relations for industrial employees and industrial economics for company officials.

Efforts to obtain Federal help continued through the Newlands bill in 1915, the Smith-Howard bill in 1917, the McNary bill in 1929, the Arentz and Haugen bills in the 1930's and bills by Representative Green, Senator Mead, and others in the 1940's. Throughout the debates on these attempts, everyone agreed to the need, which was well expressed in 1950 by H. Thomas Hallowell, then vice president, now president of the Standard Pressed Steel Co., of Jenkintown, Pa. Mr. Hallowell said:

Programs such as the ones offered by the land-grant colleges and universities can help industry improve its competitive position by improving its ability to produce * * * This ability to produce is industry's one control of inflation.

and so on.

Despite the almost universal agreement of need, no action was taken at the Federal level for reasons that had nothing to do with either the need or the value of the legislation.

The success of the programs in agriculture does give some hint of the progress that might have been made if one of them had been enacted into law.

There are several new factors intensifying the need for the Technical Services Act of 1965. It has been stated to you many times and I do not need to dwell on it, but we should remember the great burst of new knowledge that is coming forth from the enormous input of Federal moneys into research in many areas of knowledge and not only as a result of Federal effort but by some State effort. Dr. Calhoun spoke of this earlier and very few of the results of the publicly supported research can be picked up and applied directly to an industry or a company. There has to be a conversion process.

Second, American products must increasingly compete in domestic and world markets with products from foreign companies and we know that West Germany, Japan and several other countries have a highly advanced technological society and are spending large sums of money to insure continued top technological performance. A very modest expenditure in this country might have great results.

Thirdly, research and development have increasingly gone large-scale. Big industries can do their own, or most of it, but small industries cannot.

The universities are in a better position to take on this important assignment than ever before. I say this of my own institution and it is true of those all over the country. Over the years, the universities have gradually intensified their relationships with the professions and with industry and, at an increasing rate, in the last few years. Most of our member institutions have continuing extension programs in either engineering and technology or in business management, and many have programs in both. All of our institutions have expressed interest, and feel there is a need for sharply expanded extension programs in these fields and are ready to move forward as funds become available. May I add that I think we work together very effectively, but we would respond more specifically if you would like us to do so, Mr. Chairman, to the question that you asked earlier of Mr. Calhoun.

The existing programs have yielded hundreds of examples showing how entire industries and individual firms have been assisted in expanding, solving problems and in increasing profits through educational programs. While the existing programs are accomplishing much, they are seriously inadequate. They are inadequately supported and dependent upon fees.

The second difficulty with such programs is their uncertainty.

Uncertainty which stems from their uncertain financial basis. You cannot employ top-level people, able people, to perform the services with an inadequate budget. The Federal support, plus matching local appropriations, would provide a solid basis for developing a significant and meaningful program. We have several institutions represented here today, Mr. Chairman, and you have already heard examples of what can be done. We would be happy to expand on this if you like.

By virtue of the funds provided under this act being channeled through colleges and universities, it is assured that the program will be largely locally controlled. Within the broad framework of the act as before you, colleges and universities which are qualified to participate are free to develop with the industry which is important in their area programs of value and significance. The integrity of the institutions is in no way impaired or compromised. We looked for this possible impairment in the legislation but we find that it is not there.

Most universities have advisory committees for their several extension programs. With our own industrial expansion program we have an advisory committee of 15 persons with some rotating membership representing many segments of industry in North Carolina. They meet quarterly to review what is going on and make suggestions as to what is needed and where we could put our efforts the next year and in general give us a review of our programs and some advice.

The combination of university sovereignty, local advisory committees, and involvement of the industries in planning programs that will affect them provide the necessary safeguards not only for keeping the program locally based and controlled, but also sound and in the public interest.

An effective educational program to increase the level of technology will require people from several fields. In addition to different types of technologists, management specialists must be fully involved and this legislation recognizes that. Management of a firm may not need to know the details of new technology, but it must understand what it will do for the firm and the method of making use of the technology at minimum cost and for maximum benefit.

The types of technological and management personnel needed varies from industry to industry, and, obviously, can include many different specialists. Our faculty does include many such different specialists. Increasingly faculty members have appointments which provide for spending part time at teaching and part time at either organized research or extension work, or both. These arrangements often vary from year to year or may be changed even during the year. This provides the flexibility within the university to assemble whatever team of specialists is needed for a particular program for as long as they are needed.

Now for some specific comments on the act, itself.

Representatives of our association, gentlemen, served on a task force which was assembled by the Department of Commerce more than 2 years ago to begin exploring the idea of this Technical Services Act.

Our association has had its own committee for the last year and one half to advise with the Department of Commerce on the design of this program. Many of the suggestions which we have offered have been included in the act. While no bill is ever entirely satisfactory to one group, we think it is an excellent act and in the interest of the national economy and the universities and should be passed.

There are several features in the act which have particular merit. It is so written that all of the institutions of higher education which have real competence to assist industry can participate in the program. At the same time, it provides a framework for administration within the State, which will avoid duplication and should pool the knowledge resources of the State toward the common objective of improving the level of technology of industry in the State.

Another outstanding feature is permitting institutions in more than one State to cooperate and have their allocation of funds increased by 10 percent. This fits into the regional question which was spoken about earlier. In many parts of the country it will be desirable for institutions of higher education in two or more States to cooperate and this act provides an excellent incentive for them to do so. As I

see it, the word "region" is used in two sections of the bill, in the statement of purpose in the earlier part of it, in section No. 2, where it defines the purposes of the act and technical services, is said to mean activities or programs designed to enable businesses and industries to acquire and to use scientific and engineering information more effectively through such means as:

(1) Analyzing problems of regions and industries to determine new opportunities for applying technology and, (2) preparing and disseminating technical reports, abstracts, computer tapes, microfilm, reviews and similar scientific or engineering information, including the establishment of State or regional technical information centers for this purpose.

Then it is used again over in section 7, "regional or interstate programs" and I assume that it is referring specifically to programs that might serve the community like Kansas City which is in two States served by Kansas State University and the University of Missouri and so it might reach into other parts of the metropolitan community. I find no real ambiguity in the use of the term.

While the majority of the funds will be allocated under a formula to be developed by the Secretary of Commerce, 20 percent of the total appropriation is reserved for the Secretary to make grants for experimental and national programs.

This provides flexibility while at the same time providing a strong continuing base of support for the colleges and universities. This is good.

We urge you to pass this act and to fund it. The universities I represent will continue to do all they can within the limits of their resources. They ask your support for this program so they can change this to read "within the limits of their competence with adequate resources."

Mr. Chairman, we are very pleased to respond to any questions that you or any member of the committee may have.

Mr. MACDONALD. Thank you very much, Chancellor. Actually, I say, without the usual protocol of complimenting witnesses which is pro forma, this is an excellent statement and one that I have looked forward to because it does set out the association position very clearly and straightforwardly.

I just have a couple of questions and the first one is: Do you think this program should be restricted just to land-grant colleges?

Mr. CALDWELL. No, sir.

Mr. MACDONALD. Why do you say that?

Mr. CALDWELL. Let me make sure that you and I understand each other on this matter of land-grant colleges.

Mr. MACDONALD. Yes.

Mr. CALDWELL. The bill as now written provides that these be located in a university or, as an alternative—and I presume that this means if the Governor or somebody at the State wants to present its program on a different basis—then it would have to justify using some other type of public agency, such as a nonprofit agency.

I think it ought to be in the universities. In the United States we have in every State in the Union at least one State university and at least one land-grant university in the technical sense of having been established under the authority and the sections of the Land-Grant College Act of 1862 and some of the States they are the one and the same university. The University of Wisconsin, for example,

is the State's land-grant university. The University of Massachusetts I am reminded is the State's land-grant university there although MIT—

Mr. MACDONALD. Right, Harvard—incidentally, MIT is a land-grant college I found out yesterday.

Mr. CALDWELL. That's right; it is a land-grant university, yes.

Mr. MACDONALD. But Harvard College University is not.

Mr. CALDWELL. No, not in the sense of this term "land-grant university."

The term "land-grant university" derives from the act of 1862 wherein the Congress of the United States furnished to every State 30,000 acres of Federal land for every Senator and Representative if they had entered in the Congress of the United States. If they had two Senators and three Representatives then the State got 150,000 acres of land which they could sell at \$1.25 per acre which they would convert in a permanent endowment. [Laughter.]

Mr. MACDONALD. I knew that the Congress had some good purpose. [Laughter.]

Mr. CALDWELL. There was to be at least one college to teach agriculture and the mechanical arts—this was the land-grant college of 1862. There have been, historically, seminary grants in earlier days through Federal funds and there was the Northwest Ordinance of 1787 where there had been some Federal funds committed to education.

Mr. MACDONALD. Yes, sir; but what I was concerned with was whether you felt there should be research to land-grant colleges.

Mr. CALDWELL. No, sir.

Mr. MACDONALD. Under this language—you do not?

Mr. CALDWELL. No, sir. If you will look at it, you have two types of institutions—under 2-b regarding the "designated" institutions, meaning the institutional agency in each participating State which has been designated as administrator of the program for each State under section 2—

Mr. MACDONALD. So as you read the bill, you say that is not so.

Mr. CALDWELL. No, sir. In Texas, for example, it could be decided that the University of Texas was going to be the agent or Texas A. & M. was going to be the agency.

Mr. HUOT. The only restriction should be that it would have a degree in engineering and a degree in business administration.

Mr. CALDWELL. It should include those, yes, qualified institutions.

Mr. MACDONALD. Then I have been beating a dead horse because I spoke for a day or so about just that.

My second question, and perhaps my last one, is on page 8—

Mr. CALDWELL. May I just interrupt for a moment, Mr. Chairman, before we leave that.

Mr. MACDONALD. Yes.

Mr. CALDWELL. If you will read section 3 in this act it says that any State which wishes to receive Federal payment under this act in support of its existing or planned technical services and programs shall designate under appropriate State laws and regulations an institution or agency to administer and coordinate that program and to prepare and submit plans and programs to the Secretary of Commerce for approval under this act.

Now, the institutional agency designated by a State must be "a State university" or "land-grant college entitled to the benefits under the act approved July 2, 1962"—they are not synonymous. This is an either/or provision.

Mr. MACDONALD. And/or.

Mr. CALDWELL. That is and/or. [Laughter.]

Mr. MACDONALD. I see we have a lawyer present.

Mr. CALDWELL. Right, right. But that decision would have to be made within the State, as to whether it would go to one of the universities or the other. For example, take Oklahoma, where you have Oklahoma State University and the University of Oklahoma and in Mississippi you have Mississippi State and the University of Mississippi. These are separate, and the decision would have to be made at the State level, then submitted to the Secretary of Commerce as to which one would be designated to administer these funds. I assume that this would mean that it would be a local decision as long as the institutions complied with the terms of the act, and the Secretary of Commerce would be able to accept recommendations and in fact obliged to do so.

Dean RATCHFORD. But there is a difference.

Mr. MACDONALD. Would you identify yourself, please sir?

Dean RATCHFORD. Yes, I am C. Brice Ratchford, Dean of the university extension, University of Missouri. A number of institutions could be qualified and the qualified institution may get a larger share of the money than the designated one. What I mean is this: the only advantage the designated one would have would be that they had to do the planning and for that they would get \$25,000 which wouldn't cover it. [Laughter.]

That would be to administer the planning and it would be either public or private institution but any one qualified could participate fully in the on-going program, any qualified institution.

The only advantage of the designated institution is that they are going to have to take on a bigger responsibility for which they get \$25,000.

Mr. MACDONALD. And some very favorable publicity, no doubt.

Dean RATCHFORD. Well, that may be or maybe not. I think a point was made on that recently.

Mr. CALDWELL. And some control.

Dean RATCHFORD. The point that was made earlier in respect of higher education institutions. I think somebody mentioned earlier there is no difficulty in getting them to work together among the academic people even though on football days it might not appear to be that way but we do exchange students and semesters and professors.

Mr. MACDONALD. Yes, I understand that. It was also pointed out yesterday, and I don't know if any of you gentlemen were here, but there has been some difficulty among some distinguished colleges in and around the Boston area in regard to their medical program, and they are having a great hassle which is in the front pages of the Boston newspapers.

Mr. CALDWELL. Yes.

Mr. MACDONALD. And I quote—as to control the Boston City Hospital because Harvard University and Boston University and I believe Tufts University—

Mr. CALDWELL. Yes, Tufts.

Mr. MACDONALD (continuing). Use the facilities at the medical school to train their medical students at the Boston City Hospital and I am ashamed to admit it but I know it is the fact, each one is vying for position so that their own personal choice would be in charge of the program and the other two schools would have to come under that man who is designated to be in charge.

I thought that the language of this bill perhaps might lead to the same situation. That is what I wanted to get your opinion on.

Dean RATCHFORD. There may be difficulties, but the alternative universities getting together versus the State agency which is not educationally oriented and does not have the competence in this particular broad range that is needed, is the main point and I think if you presented these alternatives unanimously they would say: "Let us work it out."

Mr. MACDONALD. Well, you mentioned, Dean, that the designated institution receives only \$25,000. Is that factual?

Dean RATCHFORD. That is in the bill for the designated agency.

Mr. MACDONALD. Well, are there no fringe benefits that might accrue?

Dean RATCHFORD. No sir, no sir—that is the only fringe benefit. The rest of it would be developing programs in the institutions that are best equipped to handle it and then that would be on the basis of merit but the only fringe benefit for the designated university would be this one and, as I say, it would not cover the cost.

Mr. MACDONALD. Well that brings me to the question that I was going to ask you next, Chancellor.

Mr. CALDWELL. Yes, sir?

Mr. MACDONALD. You state on page 8 of your statement that you think this is an excellent act, one that is in the interest of the national economy, and that the universities would be benefited by it and that it should be passed. I wonder how specifically this would help the universities.

Mr. CALDWELL. Well, it helps the universities only in this sense, if I may answer your question, Mr. Chairman. I think it helps universities only to do the job they have been trying to do. We respond to a public need. Right now we have a program at our institution that is an industrial extension service, and we are always straining to help people to do their job. We need more funds and it would help us to do the job. But really it doesn't help the universities in perhaps the sense you were thinking of. We want this to help the economy which is what our efforts have been directed toward.

Mr. MACDONALD. Well, sir, I am just quoting your statements, as you understand.

Mr. CALDWELL. Yes, I understand, I understand. And really this is to help the economy and to help the country which is the only purpose of the universities, as a matter of fact. They are not self-serving operations.

Mr. MACDONALD. I can only agree and ask if there are any other questions. [Laughter.]

Mr. HUOT. I don't have any questions but I would like to congratulate Chancellor Caldwell and to express my appreciation and pleasure that the University of New Hampshire is so well represented here today through Mr. Faiman.

When we are talking about regions I think the University of New Hampshire probably stands out in its area and only recently the Kellogg Foundation gave an amount of almost \$2 million to the University of New Hampshire as designated agency for continuing education which is a matter of some credit for our university.

Going back to the statement that was made earlier I could only regret the aspect of this weight control with which I am personally involved. [Laughter.]

Mr. MACDONALD. I was about to say that the university and college which I attended is always being attacked for not being a nonprofit, or rather being a self-serving institution in that everything they own is tax free, and they own apartment houses and city blocks.

Mr. CALDWELL. Yes, sir.

Mr. MACDONALD. This, of course, is in Boston, and they are expanding in various fields, not necessarily always academic fields—in real estate as a matter of fact.

Mr. CALDWELL. Yes.

Mr. MACDONALD. They have been accused very often of being self-serving, very self-serving.

Mr. CALDWELL. Yes.

Mr. MACDONALD. Because they show a good large profit in their operations, which I don't suppose should be held against them.

Mr. CALDWELL. Oh no—certainly not.

Mr. FARNSLEY. MIT, for the record is not a land-grant institution in the sense that the witnesses used the term. It is unimportant, but—

Mr. MACDONALD. MIT is not unimportant. [Laughter.]

But I was told by the witnesses yesterday that it was a land-grant college.

Mr. CALDWELL. MIT was one of the founder members of our association of land-grant colleges.

Mr. FARNSLEY. Then I must be mistaken.

Mr. CALDWELL. Yes.

Mr. FARNSLEY. I understood that it was a land-grant college, State land grant.

Mr. CALDWELL. That is right.

Mr. FARNSLEY. Well, can't a State land-grant college join your lodge? [Laughter.]

You just said MIT is a State land-grant college.

Mr. CALDWELL. Well let me try to explain it—originally it was Massachusetts itself that designated MIT to receive some of these Federal funds to perform some of the job that is outlined in the Land Grant Act. It is the same as New York State—New York State has never had a publicly supported land-grant university but they contracted with Cornell to perform these functions.

Mr. FARNSLEY. MIT is not a Federal land grant, then—I don't know where I got that [laughter] but it belongs to your organization?

Mr. CALDWELL. Yes.

Mr. FARNSLEY. Could an institution, that only has State land-grant funds join your association?

Mr. CALDWELL. Let me say this—

Mr. FARNSLEY. Because I have got an applicant. [Laughter.]

Mr. CALDWELL. Our association has two groups of members: State-supported universities, such as the University of Oklahoma and the

University of Mississippi, then separate land-grant institutions that were established under the 1862 act of Congress, such as North Carolina State University, Oklahoma State University, Texas A. & M. University and so on. In several States these are one and the same institutions.

Now there are only two mavericks in the whole group which were designated by State legislatures at the outset to receive and to perform some of the land-grant functions contemplated by the 1862 act and they are MIT and Cornell.

Mr. FARNSLEY. But they didn't get any of the Federal land?

Mr. CALDWELL. No, sir; they got some of the funds and the proceeds from them which are held by the States themselves. They did not receive the funds in the first place but were designated instead to perform certain functions.

Mr. FARNSLEY. Now, I know I should know what this bill means and I realize that I should not be asking you about it, but if the State designates them, what do you think that means?

Mr. MACDONALD. If I could answer that, Mr. Farnsley—

Mr. FARNSLEY. Well, it could be anybody.

Mr. MACDONALD. No; it couldn't be anybody. They have to be accredited.

Mr. FARNSLEY. Where does it say that?

Mr. MACDONALD. It says it in here.

Mr. CALDWELL. No, sir; it doesn't say it. It doesn't say they have to be accredited and that is a little problem that I had with the bill, as a matter of fact. We ought to get this cleared up.

Mr. MACDONALD. Well, I would agree with you. It is a very good point.

Mr. CALDWELL. Would you allow Dean Ratchford to take care of this one?

Mr. MACDONALD. Yes.

Dean RATCHFORD. A designated institution means also that it has to be qualified.

Mr. MACDONALD. Which translated means "accredited."

Mr. FARNSLEY. Where does it say that?

Dean RATCHFORD. In the section, well—

Mr. CALDWELL. No; it doesn't say that; you say.

Mr. MACDONALD. Page 3, section (b) states they have to be—

Dean RATCHFORD. Yes.

Mr. MACDONALD. Yes; you have to relate it back from the other section.

Dean RATCHFORD. Well, I think you have a significant point. Some of us served on the task force that helped to develop this bill and I know the intent all the way through was that a designated institution would be selected from among qualified institutions and the qualified definition is quite tight.

Mr. MACDONALD. If you will permit me because we have some other witnesses, but I just feel we ought to clear this point up, because I think it is important. On page 3 it starts with section (b) and then it goes down to (c) and it says:

"Qualified institution" means (1) an institution of higher learning with a program leading to degrees in engineering or business administration which is accredited by a nationally recognized accrediting agency or association to be listed by the U.S. Commissioner of Education, or such an institution which is listed separately after evaluation by the U.S. Commissioner of Education pursuant to this subsection.

So it just can't be any one—you couldn't invent a college to benefit from this.

Mr. FARNSEY. You read the definition of "qualified institution" Mr. Chairman, but you didn't read—and I am not fussing, I am your friend [laughter] but you didn't read all of it. It says, "If the Secretary of Commerce will approve of it." And this could be lots of things. I still want to know where it says a designated institution must also be qualified.

Dean RATCHFORD. Mr. Chairman, I think I would agree with that and I would suggest that one addition be made in paragraph (b); namely, that the designated institution meet the qualifications of a qualified institution.

Mr. MACDONALD. Excuse me?

Dean RATCHFORD. Add to the (b) paragraph that a designated institution meet the requirements of qualified institutions as spelled out in section (c).

Mr. FARNSEY. Well we all know that a qualified institution would be any nonprofit organization that the State and the Secretary of Commerce is willing to approve of.

Dean RATCHFORD. This is handled in paragraph (d) on page 4.

Mr. MACDONALD. That's right, but it goes back over now to the other section and it says exactly what you said should be said.

Dean RATCHFORD. That's right. I know we meant for it to be there.

Mr. FARNSEY. Well, what does it say?

Mr. MACDONALD. Well, if you will look at page 4.

Mr. FARNSEY. All right.

Mr. MACDONALD. Under the section there for plans and programs, and I don't know if it is necessary to read it into the record but I suppose it would do no harm. It says:

Section 3. Any State which wishes to receive Federal payments under this act in support of its existing or planned technical services program shall designate, under appropriate State laws and regulations, an institution or agency to administer and coordinate that program and to prepare and submit plans and programs to the Secretary of Commerce for approval under this act. If the institution or agency designated by such State is not a State university or land-grant college entitled to benefits under the act approved July 2, 1862, or the act of August 30, 1890, and acts amendatory and supplementary thereto, the Governor or other competent State authority shall furnish the Secretary a written statement of his reasons for designating such other institution or agency.

And then you go from section 4 as to why it is an accredited institution.

Mr. CALDWELL. Section 2-b has a little phrase in there which defines participating institutions as meaning "the institution or agency in each participating State, which has been designated as administrator of the program for such State under section 3 of this act."

Mr. FARNSEY. Well, that is what I want to see. Where is that piece, sir?

Mr. CALDWELL. This is section 2, subsection b and it is on page 3.

Mr. FARNSEY. That is the participating State, though.

Mr. MACDONALD. Well, participating institution means each qualified institution in the State which participates in the administration or execution of State technical service programs as provided for by the act.

Mr. CALDWELL. That's right.

Mr. FARNSEY. But the only thing you have to do about that is, if the State wants it, write a letter.

Mr. MACDONALD. No, it says "qualified." Maybe we ought to take this up in executive session.

Mr. CALDWELL. It ought to be cleared up a little more, Mr. Chairman, in my opinion.

Mr. MACDONALD. Yes.

Mr. FARNSEY. Well, what do you think it means now?

Mr. CALDWELL. Well, I think it is intended to mean that the designated institution must be a qualified institution in order to participate as an administering agency or participating agency.

Mr. FARNSEY. But qualified could be—

Mr. CALDWELL. I think it should be made a little more explicit.

Mr. FARNSEY. A qualified institution could be any institution that the Commissioner of Education is willing to certify.

Mr. MACDONALD. Oh no, if you will permit me, Mr. Farnsey—

Mr. FARNSEY. I will. You are the chairman. [Laughter.]

Mr. MACDONALD. If you will yield, the fact of the matter is that it has to be, as we discussed with the gentleman from Texas, it has to be accredited by either an engineering society which I have forgotten the name of—

Mr. CALDWELL. The Engineers Council for Professional Development.

Mr. MACDONALD. Yes, or the Business Administration Society.

Mr. FARNSEY. You are talking about designated institutions.

Mr. MACDONALD. Yes.

Mr. FARNSEY. But if the Governor writes a letter to the Secretary saying that he wants an institution designated you never could reject his note and I don't care what it is the law says.

Mr. MACDONALD. I think a Federal commissioner could reject his note.

Mr. FARNSEY. Well it doesn't say so. It says if there is no accredited agency then the Governor or other competent State authority shall furnish the Secretary a written statement with his reasons for designating such other institutional agency.

Mr. MACDONALD. I am sure that that would never happen in Kentucky.

Mr. FARNSEY. Oh, yes, it would. We have got something called Spindletop where anything is likely to happen. [Laughter.]

Go ahead.

Mr. MACDONALD. Well, thank you very much for coming.

Mr. CALDWELL. Thank you very much, Mr. Chairman.

Mr. MACDONALD. We appreciate your testimony.

Now, gentlemen, the House is in session and I know that many of you people have come from great distances to testify before this committee, but under the rules of the House we should not be sitting here when the House is in session without the permission of the House.

Therefore, I am going to ask if it is possible for Dr. Westerlund or Dr. Wetner or Mr. Hostetler to come back tomorrow morning?

Mr. HOSTETLER. I will be unable to appear but I would like my statement to be incorporated into the record as if it were read.

Mr. MACDONALD. Yes, certainly. You are representing the New England Council for Economic Research and Development?

Mr. HOSTETLER. Yes, Mr. Chairman.

Mr. MACDONALD. Thank you very much. Your statement will be incorporated as part of the record.

Mr. HOSTETLER. Thank you.

Mr. WESTERLUND. Mr. Chairman, I shall be unable to appear in the morning, perhaps, but I would have one of my associates represent me.

Mr. MACDONALD. That would be perfectly satisfactory. With that understanding then we will adjourn until tomorrow morning in this room at 10 o'clock.

(Whereupon, at 12:10 p.m., the committee was recessed, to reconvene at 10 a.m., Thursday, June 3, 1965.)

STATE TECHNICAL SERVICES ACT OF 1965

THURSDAY, JUNE 3, 1965

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON COMMERCE AND FINANCE OF THE
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE
Washington, D.C.

The committee met, pursuant to notice, at 10 a.m., in room 2218, Rayburn House Office Building, the Honorable Torbert H. Macdonald, chairman of the subcommittee, presiding.

Mr. MACDONALD. The hearing will be in order.

Our first witness this morning will be our colleague from Georgia, the Honorable James A. Mackay.

**STATEMENT OF HON. JAMES A. MACKAY, A REPRESENTATIVE
IN CONGRESS FROM THE STATE OF GEORGIA, PRESENTING
STATEMENT OF J. WHITNEY BUNTING, DEAN, COLLEGE OF
BUSINESS ADMINISTRATION AND GRADUATE SCHOOL OF
BUSINESS ADMINISTRATION, UNIVERSITY OF GEORGIA**

Mr. MACKAY. Mr. Chairman and members of the committee, Dr. J. Whitney Bunting, dean of the College of Business Administration and Graduate School of Business Administration of the University of Georgia in Athens, Ga., asked me if I would present his statement to your committee on behalf of the American Association of Collegiate Schools of Business and the Division of Business Administration of the National Association of State Universities and Land-Grant Colleges. I have gone over this testimony with him and I would like to associate myself with the views that are expressed therein because although the University of Georgia is not located in my district, Emory University with a very strong school of business administration is situated therein. It is a brief statement and I would like to read it.

Mr. MACDONALD. Very well.

Mr. MACKAY. Mr. Chairman and members of the committee, my name is J. Whitney Bunting and I am dean of both the College of Business Administration and the Graduate School of Business Administration of the University of Georgia. I am appearing before you in the capacity of chairman, committee on Federal legislation, American Association of Collegiate Schools of Business; vice chairman, Division of Business Administration, National Association of State Universities and Land-Grant Colleges; and as a member of the subcommittee on legislation of the latter body. These two groups include in their membership the leading schools of business administration at the college and university level, both public and private. The member-

ship of the American Association of Collegiate Schools of Business is currently 117 institutions fully accredited and performing quality education for business. The National Association of State Universities and Land-Grant Colleges includes 97 publicly supported institutions with either colleges of business administration (or departments or divisions) included in its division of business administration. Statistics indicate that approximately 20 percent of all students pursuing higher education in the United States are enrolled in the field of business administration. Moreover, the faculties of business administration in these colleges and universities comprise the largest source of talent to carry out the goals and objectives of the State Technical Services Act. Through teaching, research, and consultation, these faculty members provide a tremendous resource for economic and business development in the areas of service which each purports to cover.

Although I should like to suggest, on behalf of my colleagues, one very important change or modification of proposed H.R. 3420, I wish to emphasize quite vigorously our support of the passage of this bill. We believe that the future economic and business development of the Nation, its States, regions, and communities is dependent in large part upon our ability to place in the hands of businessmen the great body of knowledge that is constantly being developed through research into economic and business operations. Moreover, much of this new knowledge must be analyzed and adapted for the use of the many diversified types of business institutions. This requires interpretation and application that can best be provided by the personnel in our collegiate schools of business in this country.

American business and industry is today a complex and dynamic process. Moreover, other nations of the world are also making great strides in business know-how and techniques, thus creating a degree of competition in world markets that will become increasingly heavy as the years go by. Many of our business firms must have firsthand knowledge of this new methodology if they are to succeed and prosper. Yet much of this new knowledge is locked away where it can do no economic good.

Millions of dollars of research money is being provided by the Federal Government to support space era growth and development. Much of the results of these research projects constitutes knowledge and information that could be tremendously useful to our business society when it can be placed in the proper hands with proper advice and assistance. The State Technical Services Act does provide a mechanism through which this knowledge can flow into the national business economy, thus serving as a strong force for rapid economic advancement and development. Our Nation cannot afford to place any roadblocks in the pathway of new knowledge into the business enterprise.

The schools and colleges of business administration which I would represent would respectfully suggest a broadening of the wording of H.R. 3420 so that it will more nearly represent a solution to national economic need. It is true that the act does specify that a qualified institution in the terms of the act should have an accredited college of business administration. However, much of the remainder of the act seems directed to the schools of engineering and, perhaps, engineering extension. We feel this to be a serious error.

Perhaps a major difficulty is the titling of the measure, "State Technical Services Act." Public connotation of the term "technical" immediately restricts activity to the area of science and engineering. It is true that such information is a vital part of any program of informational aid to business. Yet this is not the only area of potential informational support needed, nor is it even the major area. Practically every business process today is technical in nature, whether it be accounting, finance, management, marketing, or even labor relations. The application of scientific methods, procedures, and equipment to the solution of business problems and to aid in the development of the economic process is a matter of fact, now. It seems to the colleges of business that this has not been properly recognized in the bill currently before this committee, H.R. 3420. For example, a new mechanized technique in accounting provided to an industry or business is truly a "technical service." The application of computers to management decision-making is a "technical service." The application of new knowledge reached through research in the behavioral sciences is a "technical service." Even the development of ethical conduct in business situations could be a "technical service." Yet the wording of the proposed act before you does not offer strong evidence that these areas should be construed as technical services. We respectfully suggest that the House Committee on Interstate and Foreign Commerce give additional consideration to this matter.

We further suggest added recognition to the role of the colleges of business administration in the implementation and administration of the program. As indicated earlier in this testimony, the faculties of the colleges and universities engaged in higher education for business provide the greatest reservoirs of talent to apply technical services in the broadest possible sense to the solution of business problems. They have a history of strong interest in economic development in all areas of this Nation and it is their wish to continue this tradition.

If H.R. 3420 is passed and becomes the law of the land, we foresee no other successful possibility for the objectives of the act than by the full and complete utilization of the colleges of business administration along with other academic areas of our universities such as engineering, extension, agriculture, and arts and sciences.

May I reemphasize, on behalf of the associations that I represent, that we are strongly in accord with the goals and objectives of H.R. 3420. We believe it can have meaningful implication for the future development of our economy. We feel that the plan to make available "technical services" to business and industry is long overdue. But we respectfully ask that the committee consider most seriously:

1. A more detailed statement or definition of technical services to include all advances of knowledge related to business practice; and,

2. A more specific inclusion of the role that colleges of business administration must play in the proper implementation of the act.

Mr. MACDONALD. Thank you very much, Mr. Mackay.

Are there any questions?

Mr. HARRIS. I think probably it should be pointed out, as I understand this to be, that it does include business administration along with engineering.

Mr. MACKAY. I think he makes that point, Mr. Chairman, in the front of the act but apparently he has some fear that too narrow a construction would be placed on it. As I understand his testimony, he wishes the language to be not capable of the restrictive construction.

Mr. HARRIS. Did he overlook the definition of what a qualified institution is?

Mr. MACKAY. I did not understand that from his testimony. But he mentioned in the latter part of the act that he thought it should be expanded and broadened and also the definition of the technical services.

Mr. HARRIS. Technical services according to the definition means activities or programs designed to enable business and industries to acquire and use scientific and engineering information more effectively through such means as, and it goes ahead and describes what is provided—even industrial workshops, seminars, and training programs. Then it provides for a “qualified institution,” which would participate, means one of higher learning with a program leading to degrees in engineering and business administration. I really call this to your attention in order that it might get into the record.

Mr. MACKAY. I think that may be the reason for the testimony, to be sure that the legislative history shows that it is the intent of the committee that this broad interpretation be applied.

Mr. HARRIS. Actually I complained somewhat the other day to the Secretary that the whole bill was too general and too broad. What we need to do is to get it down in more precise terms so we would know just what would develop. I think there is a lot of merit to it and it should be developed on the basis that the Congress as well as the institutions and business industry and everyone else would know what it will do.

Mr. MACKAY. I feel the illustrations Dean Bunting has given are very helpful in pointing out the variety of technical services. He was very sorry that he could not be here personally.

I have enjoyed sitting in for a Ph. D.

Mr. HARRIS. Thank you, Doctor.

Mr. MACDONALD. Mr. Farnsley.

Mr. FARNSLEY. I agree thoroughly that it ought to be clear. I think your statement says that the social sciences ought to be allowed to help in this and the behavioral sciences. I believe this very strongly. I believe that any accredited college or university ought to have a chance to help, because the psychology department, sociology department, and economics department often can contribute as much as the engineering or school of business.

Mr. MACDONALD. Thank you, sir.

Mr. MACKAY. Thank you.

Mr. MACDONALD. The next witness is our colleague on the full committee, the Honorable J. J. Pickle of Texas. Mr. Pickle, welcome to the subcommittee. We will be glad to hear you at this time.

STATEMENT OF HON. J. J. PICKLE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. PICKLE. Mr. Chairman, I appreciate this opportunity to appear before this committee today in support of a vital measure which in my opinion, would help coordinate the dissemination of business

and scientific data to interested business and governmental agencies. H.R. 3420 is a bill designed to place the findings of science into the hands of American enterprise more effectively and efficiently. It seems that this bill would provide vital clearinghouses for the compilation and distribution of significant research data that our free enterprise system is constantly demanding.

As I see it, this bill would in no way create competition within the business world, or competition between free enterprise and Government. Rather, it would achieve a more effective application of the findings of scientific research, and thereby improve our Nation's competitive position in world markets.

This proposal could mean much to my State of Texas. For example, the University of Texas is a rapidly growing research center and is constantly engaged in valuable scientific studies. If efficiently assembled and compiled in a research center or clearinghouse—as provided for in this bill—these findings could be disseminated throughout our State for the use and benefit of all segments of our economy.

Although I haven't had an opportunity to hear all of the testimony on this bill, I consider the proposal a generally good and sound approach—particularly to the problem of coordinating the dissemination of scientific and business research data to all concerned.

Mr. MACDONALD. The next witness is our colleague from Georgia, the Honorable Robert G. Stephens, Jr. Mr. Stephens, we are happy to have you appear today.

STATEMENT OF HON. ROBERT G. STEPHENS, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF GEORGIA

Mr. STEPHENS. It is a condition of modern times that no nation can hope to achieve a steady rate of growth in its economy without having available the resources of science and technology. This prerequisite applies to the various regions of the world. It is true of individual nations, and it is true of all the States in America.

Research and development must be full supported. Education must prepare young people for the constantly changing needs of the society. There must be a climate in which technological change can come about with the least displacement and the broadest benefits.

Basic to an effective relationship between science and the economy, however, is the mechanism for putting the results of science into the hands of those who can put the new knowledge to practical use.

Recognizing that new scientific information does not get put to use automatically or quickly by local industries, many of our States are trying to stimulate their economic growth by developing cooperative programs between industries and universities to bring about the practical use of science. I am pleased to be able to say that the State of Georgia has been among the leaders in this effort.

Not all of the States, however, have had the resources, either financial or institutional, to set up adequate programs. Even the more successful States are not able to support programs which optimize their capabilities. The proposed State Technical Services Act of 1965 is intended to supplement local funding, by means of matching grants to the States, thereby further stimulating and enabling the development of effective programs in all of the States.

I believe that the program envisaged in this bill is one that our States can support. It is not a Federal program run in Washington. Instead, it stresses initiative on the part of each of the States. It stresses the development within each of the States of a long-range plan for stimulating business and industrial growth by exploiting local resources. It would provide for and encourage the diversity among State programs which reflects the diversity of the States themselves.

Gentlemen, those of us in Georgia know the benefits to be derived from the proposed program. I urge that this bill, the proposed State Technical Services Act of 1965, be enacted into law.

Mr. MACDONALD. Mr. Stephens, we thank you for your appearance and testimony.

Mr. STEPHENS. Thank you, Mr. Chairman.

Mr. MACDONALD. Dr. Barton A. Westerlund, director of the Research and Extension Center, University of Arkansas.

Mr. HARRIS. Mr. Chairman, I would like to say that Dr. Westerlund is here representing the University of Arkansas, our land-grant school in our State, that is very much interested in this program.

Dr. Mullins made a statement recently on the need for some such program of this kind. I had the privilege of being present and listening to his dissertation on the subject. Dr. Westerlund is a former president of Florida Business Research, Inc. I am sorry our colleague, Mr. Rogers of Florida, is not here to join in welcoming Dr. Westerlund to the committee.

He formerly taught at the University of Arkansas, having received his Ph. D. degree from that institution, and is presently associate director of the University of Arkansas Industrial Research and Extension Center, which is a part of the College of Business Administration, I believe, of the University of Arkansas.

Dr. Westerlund is here to give his views out of the experience he has had as to the importance of this program.

**STATEMENT OF BARTON A. WESTERLUND, PH. D., ASSOCIATE
DIRECTOR, INDUSTRIAL RESEARCH AND EXTENSION CENTER,
UNIVERSITY OF ARKANSAS**

Mr. WESTERLUND. Thank you, Mr. Chairman.

Mr. Chairman and members of the committee, I am Barton Westerlund, associate director of the University of Arkansas Industrial Research and Extension Center, a part of the College of Business Administration.

I am offering a statement concerning the College of Business Administration's point of view regarding the importance of S. 949 and H.R. 3420 to the development of Arkansas and, of course, the Nation.

The State of Arkansas has made considerable economic progress in recent years. In the 4 years, 1959-63, Arkansans increased their total personal income a phenomenal 26.5 percent. The major impetus to this truly great increase has been the rise in the wages and salaries paid by business.

However, Arkansas, as a result of her late emergence as an industrial State, continues to have a low per capita income relative to the Nation. In 1963 the Arkansas per capita income was \$1,607, or 65.6 percent of the national per capita income of \$2,449.

Perhaps since the family is the typical consumption unit, Arkansas's economic status is more adequately portrayed by family income. In 1959 the census reported there were 42 counties in which the median family income was less than \$3,000 annually. At that time the median family income for the Nation was \$5,657 and \$3,184 for Arkansas.

Even though Arkansas has progressed greatly in recent years, and new businesses have been organized—some have been brought into the State—there has been an employment loss due to inefficiencies of existing businesses. A great boost to the economy would occur if we could prevent further employment losses in existing businesses.

A partial answer to avoiding further employment decreases is to bring sound managerial advice as well as technological knowledge to these firms. Often the problem is not lack of technical skill but rather lack of business skill; for example, in the marketing of products and in the financing of the firm.

Arkansas can accelerate its economic growth if local businesses grow and prosper. Among the most important requirements for successful business growth is the need to develop and inform management. Management development can be achieved through a combination of formal education, short courses, and counseling services.

The need for expert guidance in today's complicated business problems has become increasingly apparent. Large-scale business has been able to obtain the advice of various types of experts as the need arises. Many small businessmen are unable to obtain such services, however, or being unfamiliar with advantages obtained from such services, are reluctant to seek advice. Therefore, public agencies can serve as a means of introducing the small businessmen to the use of outside assistance.

Our State has pioneered in this field. The University of Arkansas established the industrial research and extension center, a part of the College of Business Administration, in 1955, at the same time the general assembly established the Arkansas Industrial Development Commission. The industrial research and extension center's objectives are (1) to assist the Arkansas Industrial Development Commission and other development agencies by providing an organization with a wide background of research and technical skills; (2) to provide local development groups and communities with advisory services, research and assistance on technical problems; and (3) to provide a coordinating agency within the university structure for economic research and management training programs.

The industrial research and extension center has engaged in several types of extension services during the past decade. It has provided a limited counseling service to small businessmen throughout its history. It has also offered a variety of management education programs and, together with other organizations, has provided formal management counseling services.

Its first experience in the latter field was a jointly sponsored program with the Arkansas State Chamber of Commerce, which in 1958 resulted in a published report entitled "Helping Arkansas Manufacturers Expand."

Dr. Winston C. Beard refers to this report in describing the program as follows:

"The limitations of management itself are the chief problems of small manufacturers as viewed by bankers and outside observers." This conclusion was reached after case studies of 22 small manufacturing firms in a recent joint study

by the Arkansas State Chamber of Commerce and the University of Arkansas's Industrial Research and Extension Center. Far overshadowing the financial handicaps of these firms, most of which had been selected as having promising expansion potentials, were four management limitations. Three concerned the training, staffing, and succession of management within the firm. The fourth, and major limitation, was the failure to seek and use outside advice.¹

Under the provisions of the Small Business Administration grant programs in 1959 and 1960, the Industrial Research and Extension Center, together with three other agencies—Arkansas Industrial Development Commission, First Arkansas Development & Finance Corp., and the Arkansas State Chamber of Commerce—conducted counseling programs for Arkansas businesses. The objective of this program was to determine the most effective means of counseling small firms. Experiments were conducted in mass counseling and individual counseling. Mass counseling or conferences are both useful and feasible according to this study. Forty companies received counseling by means of three "clinics," and 80 percent of the participants appreciated the value of the information presented to them and expressed a desire to attend additional seminars on subjects pertinent to their industries. The individual advisory services were limited and brief, usually involving between 2 and 5 man-days of time for a preliminary visit and a specific consulting service. The cost usually was between \$200 and \$1,000.

Various types of consultants were used. In the followup study management firms receiving the consulting services were asked their opinion concerning the usefulness of this type of service. The preponderance of opinion was that these advisory services were of real value to their operations. In 1963 managers of two of the firms receiving this advice were designated "outstanding small businessmen" by the President of the United States.

Because of the industrial research and extension center's unique qualifications of personnel and experience, the university, with the concurrence of the commission on coordination of higher educational finance, and on the recommendation of the Arkansas Economic Expansion Study Commission, asked the legislative council and the Arkansas General Assembly to provide funds for the expansion of the business extension and technical services division of the industrial research and extension center. A modest appropriation was granted for the next biennium with the intent that additional funds might be obtained from the Federal Government under the proposed Technical Services Act.

In Arkansas major benefits from H.R. 3420 and S. 949 will come from the application of modern techniques of accounting, marketing, financing, production management and personnel management to the problems of the relatively small Arkansas business concerns in all fields of business. This includes retailing, banking, manufacturing, and the service businesses such as those that serve the tourist industry. Of course, manufacturing firms and some other businesses will benefit from new scientific and engineering technology that will be made available under the proposed Technical Services Act.

We think the industrial research and extension center should have a minimum of six regional offices staffed with appropriate management and technical advisers to serve business under the State Technical

¹ "An Experiment in Advising Small Manufacturers" by Winston C. Beard (assistant professor of finance, the University of Texas, formerly on the staff of the University of Arkansas Industrial Research and Extension Center), p. 1.

Services Act of 1965. Economic studies of the major industries of each region will need to be made and case studies of representative business firms of each type of business in each region will be needed to determine the nature of the problems facing these business concerns.

The economic and case studies will furnish the teaching materials needed for management seminars and workshops. In addition, by the use of members of the staff and consultants the industrial research and extension center hopes to bring a number of representative business firms in the various lines of business up to a high level of efficiency so that they could be used as demonstration centers for the participants of the management seminars and workshops.

In summary, S. 949 and H.R. 3420 will make it possible for Arkansas to have a complete and effective program that will create more jobs at higher wages. It will fill the gap in our present program which practically ignores the problems of the business concerns already operating in Arkansas—mostly home-owned business concerns. The thousands of small business concerns which dominate the Arkansas economy are desperately in need of the benefits that latest developments in business and science can contribute.

I might add that in Arkansas this act has the support of the Arkansas Bankers Association and the State chamber of commerce.

I should like to make one further comment. We have the support for this legislation from groups such as the State chamber of commerce and the Arkansas Bankers Association. In addition, I would like to offer to the committee these two studies to which I referred concerning the counseling techniques used under the SBA programs.

Mr. MACDONALD. They will be included.

Mr. HARRIS. Observing that they are pamphlets, they might be included in the files of the committee. Let the committee determine if it would be appropriate for them to be included in the record. Otherwise, let them remain for the information of the committee in the files.

Mr. MACDONALD. Very well. Thank you, Doctor. I want to congratulate you on your statement and also point out a fact that I am sure you know.

Our distinguished and beloved chairman of the full committee is from Arkansas and certainly Arkansas could not have somebody here in the Congress who protects the interest of Arkansas to my very personal knowledge better than the chairman of our full committee.

I am sure your words and your support of this bill will be very carefully noted by our chairman.

Mr. WESTERLUND. I appreciate those remarks, Mr. Chairman. I do want to mention that all of us in Arkansas do appreciate Mr. Harris' efforts in this regard.

Mr. MACDONALD. You are very wise to do so.

Mr. CURTIN. May I ask a question, Mr. Chairman?

Doctor, have you estimated how much you would need from the Federal Government each year to carry out the purposes of this act as you outline in your statement.

Mr. WESTERLUND. This is rather difficult to say. The State appropriated a modest sum, I think \$54,000 for the first year operation and \$56,000 for the second, with the idea of beginning a pilot program, because we feel, of course, that we cannot go into a full-blown program immediately. We have to have some further experience and we

expect within a matter of 2 years to have a much larger program if it proves feasible. I would like to point out to you that we believe that the industrial research and extension center will have to broaden some of its professional talent. We need to obtain the services of other people from other colleges and the graduate institute of technology within the university. This would be a coordinated university program as far as we are concerned.

Second, we would expect to use outside consultants. We foresee that this would be a method of actually increasing the use of consultants because we could only isolate the problems and perhaps demonstrate what might be done and from then on the best interests of the businessmen would be served by using private consultants.

Mr. CURTIN. But you are not able to put a dollar mark on how much you would ask of the Federal Government to accomplish this.

Mr. WESTERLUND. We would hopefully expect to receive matching funds, possibly to the same amount that we have appropriated from the State legislature for this purpose in the early stages of the program. I have examined various copies of the bill throughout its progress as it evolved and realize there have been various suggestions as to the amount of money. Not really fully anticipating Federal participation we had thought our programs would require a million dollars a year in order to do this job effectively in a State such as Arkansas, but this could not be accomplished immediately.

Mr. CURTIN. You mean a million dollars from Arkansas and a million dollars from the Federal Government or a total of the million dollars?

Mr. WESTERLUND. A total of a million dollars is an estimate of what it would be in 5 years. That is some time ago and perhaps we would revise our estimates now.

Mr. CURTIN. Thank you.

Mr. HARRIS. As a matter of fact, you would be limited by the amounts available from the State.

Mr. WESTERLUND. That is right.

Mr. HARRIS. If it were available now then the maximum under the action of the State legislature would be \$54,000.

Mr. WESTERLUND. That is right.

Mr. HARRIS. From the Federal Government. You would be guided, of course, by the limitations placed on you as to the availability of local funds.

Mr. WESTERLUND. That is right. There has been some discussion whether or not there should be some fees paid by businesses taking part in courses and that type of thing. There have been a number of points of view on this. There are a number of different plans in operation today in the various States.

Mr. HARRIS. Would your center be the agency that would develop the plans under the proposed bill?

Mr. WESTERLUND. I should imagine it would.

Mr. HARRIS. Or would the AIDC be the organization?

Mr. WESTERLUND. No; I am sure it would be within the university structure.

As I mentioned to you before, Mr. Harris, this would be an overall university program and we would involve personnel from other colleges as well as the university under the terms of the act.

Mr. HARRIS. I do not believe we have another institution in our State that offers courses in engineering and business administration.

Mr. WESTERLUND. They do in business administration, sir, but they do not have a college of business administration, as such.

Mr. HARRIS. But they do not in engineering.

Mr. WESTERLUND. The first 2 years, but not a full course. So, most likely if there is any institution of higher learning designated, the University of Arkansas would be so designated.

Mr. HARRIS. Thank you, sir.

Mr. MACDONALD. Mr. Farnsley.

Mr. FARNSLEY. It has long seemed to me unfair that there was not a service available to businessmen that parallels the service available to the farmer, such as the research in the State or land-grant universities with the county agent to channel that knowledge to the farmer. Is the service that you furnish one that is parallel to that?

Mr. WESTERLUND. It is somewhat parallel but much more limited financially.

Mr. FARNSLEY. If you had the money it is the same principle.

Mr. WESTERLUND. That is right.

Mr. FARNSLEY. How much engineering do you need?

Mr. WESTERLUND. This is something we really do not know as yet. We have had chemical engineers, mechanical engineers, and water geologists and other people on our staff at various times. In addition to that we have drawn on the staff of the college of engineering.

Mr. FARNSLEY. Is there any doubt in your mind that the schools of business administration should be the captain of the team and call on the necessary technicians from engineering and from social and behavioral sciences?

I do not want to lead the witness. I want to know what you think about it. Who should be the captain of the team?

Mr. WESTERLUND. That is a very difficult question. I really believe that this is a new form of organization that we have here, and I think the businessman is accustomed to those who are business oriented.

Mr. HARRIS. If the gentleman will yield, under the bill whoever the Governor designated would be the captain. That would be left up to the decision within the State, as I understand.

Mr. WESTERLUND. Yes, sir.

Mr. FARNSLEY. There is a strong indication that the captain be, 1, engineering; and 2, school of business.

Mr. HARRIS. I do not think so. I believe it leaves it to the Governor to designate.

Mr. FARNSLEY. I agree that is true in the bill. I am not trying to find out what the bill says, but what the witness feels is desirable. I was hoping he would say his outfit was the proper captain of the team but he seems to be too modest.

Mr. WESTERLUND. Mr. Farnsley, according to the action of the State legislature it was evident that they thought such back about 10 years ago.

Mr. FARNSLEY. Thank you, sir.

Mr. MACDONALD. Doctor, I just have one question, and I know you were here yesterday and it is in the same reference. On page 5 you talk about the studies to be made of the industries of each

region and repeat each region now and again. I was wondering what region you had in mind as far as Arkansas would be concerned.

Mr. WESTERLUND. At Arkansas we have done a preliminary State economic plan and have divided the State into various regions.

Mr. MACDONALD. In other words, this would be regions within the State of Arkansas.

Mr. WESTERLUND. Yes.

Mr. MACDONALD. And not as the gentleman from the Department of Commerce said the region would be two or more States.

Mr. WESTERLUND. This does not present a real complication. For instance, we might want to cooperate with the area around Memphis in eastern Arkansas and the area around Texarkana in Texas. These can be worked out. I do not think they are mutually exclusive.

Mr. MACDONALD. My question goes to the fact that if a Governor designates an agency within a State, I do not quite see how he could designate a regional area. That would take cooperation between the various States.

Mr. WESTERLUND. It would be an interstate type of compact which could be arranged and very logically in some cases.

Mr. MACDONALD. I now repeat my question: What region would you think Arkansas would be in?

Mr. WESTERLUND. I really do not know how they would designate it. We are officially in the west south central as far as the census is concerned. I do not believe these are the regions they are talking about. I believe it is necessarily a bit ambiguous and vague because many times a region is a region because it thinks it is a region, an economic unit rather than a political unit.

Mr. MACDONALD. Thank you, Doctor.

Mr. WESTERLUND. Thank you.

Mr. Walter W. Wegner.

STATEMENT OF WALDO W. WEGNER, DIRECTOR FOR THE CENTER FOR INDUSTRIAL RESEARCH AND SERVICE, IOWA STATE UNIVERSITY, AMES, IOWA

Mr. WEGNER. Thank you, Mr. Chairman. I am Waldo Wegner, director of the Center for Industrial Research and Service, Iowa State University. Iowa State is the land-grant university in Iowa and we have been in operation since 1963 as I will tell you. You have a full statement from me which has considerably more detail than I will present to you now. It has some percentages of the type of projects we have handled in our 2 years of existence and some other details I did not feel would be on a time basis practical here.

Mr. MACDONALD. Would you want them included in the record?

Mr. WEGNER. I would like to have the original statement included in the record, if I may.

Mr. MACDONALD. Without objection, it will be included in the record.

(The statement follows:)

A REPORT ON THE CENTER FOR INDUSTRIAL RESEARCH AND SERVICE (CIRAS),
IOWA'S SERVICE ORGANIZATION FOR INDUSTRY

The need for technological aid and assistance to industry has existed in Iowa for sometime; however, it has become more evident in the last few years because of the growing industrialization of the State. Iowa has many and varied industries, but they have, in general, been sheltered by the broad umbrella of agriculture. In recent years, however, the umbrella seems to have been turned over. The total value of annual agricultural production in Iowa in 1964 was \$2,600 million and this figure continues to grow each year.

The problems of growth in many cases, however, require solutions using engineering or scientific technologies.

Almost daily some segment of industry—corporation or individual—makes inquiry at the university for technical assistance and guidance. In the past, or more specifically, prior to the establishment of CIRAS, such inquiries usually had been only superficially answered, if at all. This fact highlighted the need for technical assistance to industry.

As these needs were recognized and the pressure for some type of assistance increased, the question arose as to the role a university should play in helping solve these needs, particularly the role Iowa State University should play.

To aid in making the decision as to the nature and extent of this role, four engineering staff members visited some of the major research and development institutes, centers, parks, and industrial programs which seemed to be having an impact on industrial growth in their areas.

Those men studying the problem soon set out at least four basic technical assistance needs that existed:

1. Counseling, consultation, and guidance.
2. Specific problem solutions and aids.
3. Long-range research and planning.
4. Education and training.

It became evident to these men that a direct aid to industry program at Iowa State University would have to be conducted by a group devoted specifically to this purpose. They believed that the institutes and the research parks, which they visited, did not quite do the job that Iowa State University would have to do for the State of Iowa. The problem was then to set up an organization which could undertake a distinctly different role than had heretofore been attempted.

After the scope had thus been narrowed down by the committee, they proposed that the following program of university activities relating to industrial aid be initiated:

1. The establishment of a center in the college of engineering for the specific purpose of helping industry directly with its problems. This center would consist of a core of full-time employees who would provide technical assistance and service to parties interested in the development of industry in the State.

2. Qualified persons in engineering, science, business, economics, technical counseling, and research would be employed directly by the center and would be supplemented by other part-time staff on a consulting basis.

The functions of this group would be to counsel with industry on special problems, to advise regarding appropriate procedures for product development, marketing and production, and to conduct research and testing programs where necessary. In addition, the group would provide technical and managerial information through publications and conferences specially oriented for industrial use. The counseling services would be free, although research or special projects would be paid for by the interested industry, depending on the need and the industrial potential for the State. In general, funds for the center would be provided from State appropriations.

Through the cooperative efforts of university and industrial personnel, the proposal for the establishment of a center for a direct aid to industry was incorporated in the university's request to the State legislature in 1963. The legislature accepted the challenge and appropriated \$250,000 for the first 2 years for a program of engineering and technical assistance to Iowa's growing industry. The program was named the Center for Industrial Research and Service (CIRAS).

CIRAS opened its doors on July 1, 1963, with one employee. This man was a civil engineering graduate who temporarily was located in the dean of engineering's office. It was my privilege and good fortune to be offered the position of the

first director of this new program. I took over these duties as the director on a part-time basis on September 16, 1963, and moved into the office in which we are presently located on October 1, 1963. At that time my office included three desks and four chairs.

The Iowa State University administration did not, nor did the dean of engineering and the four engineering staff members who had made the outline which I presented to you earlier, hand me a format with the order that there was my organization chart—do something with it. They welcomed me to the campus, indicated that I must operate under the administrative rules of the university, and that my main job would be determined by the needs of the State of Iowa for service to industry. With this kind of confidence from the administration and the genuine support of the engineering college, CIRAS became active.

The CIRAS appropriation for the biennium, as indicated above, was set at \$250,000. The administration had, of necessity, rather arbitrarily set up a budget for the first year of \$100,000 and of \$150,000 for the second year.

We had been in operation for no more than 2 weeks when a committee from the Consulting Engineers Council of Iowa visited the office. They had previously indicated a serious misgiving and concern for the establishment of such an operation at Iowa State. It is my understanding that this objection originated in the national offices of the CEC. I welcomed the opportunity to discuss the program with this committee and offered to appear on a panel discussion of the program of CIRAS at the annual meeting of the State association of the consulting engineers. This panel discussion included a consulting engineer, the director of the Iowa Development Commission, an industrialist, and myself. The opportunity to discuss the program with this group of men was one of the most valuable public relation tools that a new organization could have been offered. I was also then given an opportunity to participate in the same type of program at the annual meeting of the Iowa Engineering Society, which is the State chapter of the National Society of Professional Engineers, and reached the many engineers who are not consulting. This gave the consultants that were members of the National Society of Professional Engineers a check on whether or not I would tell the same story twice.

I am happy to say that I count the consulting engineers and the engineering profession as a whole to be the strongest backers of the program which we have set up in Iowa. I believe that as I discuss the operation of CIRAS you will understand why they have become boosters for the program. I understand that NSPE had indicated opposition to the original technical services bill but it is with a great deal of pleasure that I read to you the NSPE policy approved by the executive committee regarding engineering information dissemination programs.

"The National Society of Professional Engineers endorses legislation and other activities designed to stimulate and assist the dissemination of current engineering information to industry through State educational institutions and other sources at the State and local level.

"Federal assistance to the States for this purpose will serve to stimulate the economy and the efficient use of engineering technology and will be to the benefit of the general public through higher levels of employment, improved standards of living, and more efficient production for a competitive position in world markets.

"Legislation to accomplish this purpose would insure that the Federal Government, through its financial assistance should not support engineering research or provide services to proprietary interests. Engineering information gathered and disseminated under the program should be made available to the general public and industry on a broad and general basis. An advisory council, including representation from the engineering profession, and industry, should be established at each level of operation of the program to monitor it for policy guidance and general direction."

I would like to take the rest of my time with you today to discuss the relationship between CIRAS and industry, or a client, and then give you a brief report of the things that we are establishing in the office for the future handling of problems.

Problems to be solved and questions to be answered come to the CIRAS office either through personal contact, telephone call, or by correspondence. One or more members of the CIRAS staff review the problem presented to determine its scope and type (marketing, management, product development), and the length of time that they estimate it would take to solve the problem or find the answer. If it is obvious that it is a problem that will take more than 2 or 3 man-days to solve, the staff automatically attempts to find a consultant, or a firm of consultants, that is in business in the State of Iowa and has the ability and the

experience to solve the problem. We attempt to give the names of at least two or three firms or individuals in each case if we have this number on record.

If the firm or individual with the problem negotiates a contract with one of the firms or individuals referred to him by CIRAS, we then step out of the picture.

Occasionally we find that we do not have a firm of consultants recorded which has the capabilities and experience of handling a problem submitted to us. We then attempt to find a professor with the knowledge and background to do the job. CIRAS cannot lose sight of the fact that the major responsibility of Iowa State University is to educate the youth of Iowa. We, therefore, make it a practice in most cases to contact the head of the department and check on the academic load of the professor or professors whom we wish to recommend to the CIRAS client. If we find that one professor is heavily loaded with academic work, we must then use only the name of the professor with comparable experience and a lesser academic load. When we do find the man that is available for this consulting job, we try to get him together with the CIRAS client and hope that they will negotiate a contract to the mutual benefit.

Occasionally we will have a situation where we are unable to find the talent in the State that is capable of giving the proper answer to the troubled industry or individual, we then, very grudgingly, go out of State on referrals.

In all situations, it is the desire of CIRAS to put those industries, or individuals, with problems in touch with the firms or individuals who can solve their problems.

In the situations just discussed, we have assumed that all industries, or individuals, who have come to CIRAS are able to pay for the services of a consultant. We do, however, have situations where small firms or individuals and some fairly good sized firms, are having financial difficulties, and find themselves unable to pay for the services of such a consultant. In these cases, CIRAS can serve in one or two ways:

1. We can utilize to the fullest extent the ability of our own staff.

2. We have a limited amount set up in our budget to retain specialists or professors as consultants to aid in areas where our staff is not adequate. In these situations the work is done without charge to the industry or the client.

This action is justified by the fact that employment is important to the local community, and the industry is important as a tax source to the State. Therefore, we believe that we are justified in attempting to keep this industry alive for Iowa.

One area of concern in our organization was that of duplicating the efforts of other State and Federal activities. We find that we are working very closely with the Iowa Development Commission. One activity of IDC is the Iowa Development Commission Foundation (IDCF), Inc., which has been established to aid inventors within the State by helping them with patent search and patent applications, preparation of models and prototypes of inventions, and development and placement of these inventions into production. Quite naturally our efforts are bent toward assuring that these inventions will be manufactured within the State of Iowa.

CIRAS works very closely with this group and at the time that it is ready to take an invention to a manufacturer, it is almost mandatory that we make contacts with the industry through CIRAS representatives working together with men from the IDCF, Inc. The Iowa Development Commission Foundation, Inc., has relieved a great deal of pressure and time-consuming effort from the staff of CIRAS.

Since July 1963 CIRAS has completely furnished its office and established office procedures for operation. One of the first items in our plan was to obtain for our files a complete roster of the consulting engineers and consulting firms in the State. This was done via the questionnaire route. We continue to gather data on these people including a résumé of the principals of the firms, a list of work done, capabilities, and the value of their projects. We also have a fairly complete roster covering the education, qualifications, and the experience in production and research of the professors in the College of Engineering at Iowa State University. We are now gathering this same information from the professors in the other colleges. We expect to have this same type of data on the professors that are willing and have a desire to help with our program in the other State-owned institutions of higher learning in Iowa, as well as the privately owned colleges and universities.

We have gathered similar facts on the certified public accountants, the patent attorneys, testing laboratories, advertising agencies, and architects. We will also tabulate information on other professions whom we expect to be using on a referral basis.

In establishing the format for the operation and organization of CIRAS, it was considered to be practically impossible to get the operation off the ground if we did not make personal contact with the industry that now exists in the State. We, therefore, divided our State into four sections and placed qualified field representatives into these specific areas. The major assignment of these field representatives until completed, is to gather pertinent data on every industry in the State.

We have stayed with SIC classification of industry and this is our bible for determining where contact should be made. The information that the field representatives gather from these Iowa companies includes all pertinent data which will be beneficial in handling requests for various types of help. Our field representatives also discuss with industry any problems which they may have. However, the major assignment on the initial contact in addition to advising industry of the availability of CIRAS, is to gather this information which we place on a retrieval system in our office.

The present staff of CIRAS is made up of nine men and two women. The administrative staff consists of myself and my secretary, who is responsible for my dictation, typing, and filings. Another stenographer serves the other professional staff in headquarters and acts as receptionist for the CIRAS office. She also does the clerical work on the retrieval system.

We have an industrial engineer who also has a masters degree from the Harvard School of Business and is responsible for the product development, production line organization, taxes, financial problems, and industrial management.

Another man in the office is a marketing specialist with minor degrees in advertising and economics. His field of operation is that of marketing and advertising. He is responsible for the professional review of all the records before they go into the retrieval system. He also has the responsibility of establishing the format for CIRAS brochures and reports.

The staff engineer is a mechanical engineer with experience in two industries. He is filling the billet which we have set up for a young man with 4 or 5 years' experience, who has a family and who is desirous of returning to the university for an advanced degree. We are able to pay him a bit more than the usual stipend of a scholarship. His major job, besides the professional assignments given him, is to make the actual contact with the professors of the other colleges of Iowa State on a counseling basis. This requested counseling time by the staffs of the various colleges has been given unstintingly. We find ourselves using the talents of the professors in home economics, science, agriculture, and veterinary medicine very often.

The other staff member working out of CIRAS headquarters is a chemical engineer who handles assignments along his professional line. He came to us with a background of experience in the rare-earth field. He is on the staff of CIRAS and the chemical engineering department on a half time basis with each.

The field representatives include one civil engineer, with a background of many years in municipal design, construction, operation, and administration, as well as background of industrial experience in product development, production line organization, and sales.

Another field man is an industrial administration graduate, who came to us from Collins Radio Co. in Dallas, Tex.

The third man is an industrial engineer with experience with Eastman Kodak Co. in Rochester, N.Y.

The fourth field man, who will join us on the 15th of June, has a background of agricultural engineering. His experience has been in industrial research with the Farm Equipment Institute, grain-processing machinery, and advertising and sales. This then gives you some idea of the qualifications which we have tried to incorporate into the limited staff which we are able to retain.

We are convinced that the field organization is imperative in accomplishing the mission of CIRAS. The fact that the field men have made over 2,700 contacts with various industries in the State of Iowa, will bear out this belief. We have also sent out two large mailings of a brochure, of which I have a few available in case you are interested. Good stories have appeared in the newspapers and industrial magazines of the State. These actions have resulted in over 670 inquiries of various types.

We also believe that it is important that CIRAS be generally known throughout the State. With this in mind, I have appeared before more than 85 groups, such as service clubs and industrial development organizations, and have told the story of CIRAS to over 4,700 people.

The source of the first 670 inquiries received and handled by CIRAS are as follows:

Source of projects:	<i>Percent</i>
From business firms and manufacturers.....	61
Individuals.....	30
Other Government agencies.....	6
Development groups.....	3
Total.....	100
 Method of handling projects:	
CIRAS and ISU staff research.....	60
Referred to consultants (including engineers, CPA's, architects, testing labs).....	26
Referred to university professors (as a consulting project).....	14
Total.....	100
 Types of problems associated with projects:	
Technical.....	47
Management.....	20
Inventions and new products.....	15
Marketing.....	12
Production.....	4
Design.....	2
Total.....	100

On April 23 of this year, CIRAS held the first meeting of its advisory council. This group consists of 21 men at the present time with 12 of them coming to the council from industry and of this 12, 2 of them are doubling in brass as representatives of industry and the Iowa Engineering Society. Two representatives of the Consulting Engineers Council of Iowa and the remaining seven include a representative of the Certified Public Accountants in Iowa, the Iowa Manufacturers Association, the Iowa Development Commission, the Des Moines Register & Tribune, and representatives one each from the State University of Iowa, the State College of Iowa and Iowa State University, outside of the college of engineering. At the first meeting of this council, a chairman and vice chairman were selected, bylaws were discussed and will be prepared for the next meeting. We believe that this group can serve as a sounding board for the activities of CIRAS and more closely coordinate our efforts to the needs of industry in the State.

CIRAS is not a panacea for all problems connected with industrialization of Iowa. In fact, it is only a small part. It does, however, open one channel of communication with industry and makes possible a direct and positive contribution by the university to the future health of Iowa's economy.

Mr. WEGNER. The State of Iowa is this month completing its second year of operating the Center for Industrial Research and Service, CIRAS, Iowa's service organization for industry. CIRAS is administered through Iowa State University, Ames, Iowa.

I would like to present to you today a brief rundown on the operation and accomplishments of the past 2 years by this new organization. I would also like to indicate to you how I believe the Technical Services Act of 1965 will be of assistance to the Iowa program and the Federal program in other States of the United States.

The problems of industrial growth require solutions using engineering and scientific technologies. This is obvious from the fact that almost daily some segment of industry, corporation or individual, makes inquiry at the university for technical assistance and guidance. In the past, or more specifically in Iowa, prior to the establishment of CIRAS, such inquiries usually had been only superficially answered. This situation highlighted the need for technical assistance to industry.

CIRAS counsels with industry on special problems, advises regarding appropriate procedures for product development, marketing, and production, and conducts research and testing programs when necessary. In addition, CIRAS provides technical and managerial information through publications and conferences specially oriented for industrial use.

The counseling services are without charge, although research or special projects would be paid for by the interested industry, depending on the need and the industrial potential for the State. In general, funds for the center are provided from State appropriations.

This type of program was approved by the Iowa State Legislature in 1963 and they appropriated \$250,000 as a general line in the budget of Iowa State University for the operation of CIRAS for a 2-year period.

It was my privilege and good fortune to be offered the position of the director of this new program. I took over these duties on October 1, 1963.

The Iowa State University administration did not, nor did the dean of engineering or the four engineering staff members who had done the initial study and planning hand me a format with the order that here was my organization chart—do something with it. They welcomed me to the campus, indicated that I must operate under the administrative rules of the university and that my main job would be determined by the needs of the State of Iowa for service to industry.

This type of freedom of operation was a major factor in getting the operation underway in a short period of time.

I believe this type of flexibility is available in the Technical Services Act of 1965, and it is my opinion that it is one of the real necessities for satisfactory accomplishment of the purpose of the bill.

We had been in operation for no more than 2 weeks before a committee from the Consulting Engineers Council of Iowa visited the office. (I think at this point I should point out that I am a graduate engineer and a registered professional engineer in the States of Iowa and Minnesota. I have been active in the Iowa Engineering Society and the National Society of Professional Engineers for many years and have served as president of the Iowa Engineering Society and vice president for the North Central Region of National Society of Professional Engineers. I am also a member of the American Society of Civil Engineers.)

The Consulting Engineers Council of Iowa had previously indicated serious misgivings and concern about the establishment of such an operation as CIRAS at Iowa State. It is my understanding that this objection originated in the national offices of the CEC. I welcomed the opportunity to discuss the program with this committee and offered to appear on a panel discussion of the program of CIRAS at the annual meeting of their State association. This panel discussion included a consulting engineer, the director of the Iowa Development Commission, and an industrialist and myself. The opportunity to discuss the program of CIRAS with this group of men was one of the most valuable public relations tools that a new organization could have been offered.

I was also given an opportunity to participate in the same type of program at the annual meeting of the Iowa Engineering Society,

which is the State chapter of NSPE, here I reached the many engineers who are not in consulting. This also gave the consultants who were members of the National Society of Professional Engineers an opportunity to check on whether or not I would tell the same story twice.

I am happy to say that I count the consulting engineers and the engineering profession as a whole to be the staunchest backers of the program which we have set up in Iowa. It is my belief that this group of people, the professional engineers and consulting engineers, stand to gain more than any other group outside of industry from the operation of CIRAS.

Problems to be solved and questions to be answered come to the CIRAS office either through personal contact, telephone call, or by correspondence. One or more members of the CIRAS staff review the problem presented to determine its scope and type (marketing, management, product development) and the length of time that they estimate it will take to solve the problem or find the answer.

If it is obvious that the problem will take more than 2 or 3 man-days of work, the staff automatically attempts to find a consultant, or a firm of consultants, that is in business in the State of Iowa and that has the capability and the experience to solve the problem. We attempt to give the names of at least two or three firms or individuals in each case, if we have this number on record.

If the firm or individual with the problem negotiates a contract with one of the firms or individuals referred to him by CIRAS, we then step out of the picture.

In order that we might do a good job for industry we felt that it was necessary to gather as much information as it was possible to put together and set it up on a retrieval type of system so that it would be available when questions would be placed with CIRAS. Working toward this goal we have a roster of the consulting engineers and consulting firms in the State of Iowa. In this information we have the data regarding a résumé of the principals of the firm, a list of the work done, capabilities, and the value of their projects. We also have a roster covering the education, qualifications, and the experience in production and research of the professors in all of the colleges at Iowa State.

We are now in the process of planning how to gather this same information on the professors in the various private colleges in Iowa, as well as the other State-owned institutions of higher learning.

We have gathered similar facts on the certified public accountants, the patent attorneys, testing laboratories, advertising agencies, and architects. We will also tabulate information on other professions whom we expect to be using on a referral basis.

We are putting together a rather complete record of every industry in the State. This information includes all pertinent data which we believe may be of value in understanding the industrial capabilities, potential, and problems.

These data are being gathered by the four field representatives of CIRAS. Our total staff, including the four field representatives, is nine men and two women.

Occasionally we find that we do not have a firm of consultants on record which has the capabilities and experience of handling the

problem submitted to us. We then attempt to find a professor with the knowledge and background to do the job. CIRAS cannot lose sight of the fact that the major responsibilities of the State's institutions of higher education are to educate the youth of Iowa. We therefore make it a practice in most cases to contact the head of the department and check on the academic load of the professor or professors whom we wish to recommend to the CIRAS client. If we find that one professor is heavily loaded with academic work, we must then use only the name of the professor with comparable experience and a lesser academic load. When we do find a professor who is available for the consulting job, we try to get him together with the CIRAS client and hope they will negotiate a contract to their mutual benefit.

In all situations, it is the desire of CIRAS to put those industries, or individuals, with problems in touch with the firms or individuals who can solve their problems. We are definitely middlemen.

As a sounding board for checking results of past performance and planning for future activities, CIRAS has organized an advisory council. This group consists of 21 men. Twelve of them come to the council from industry and of this 12, 2 of them are doubling in brass as representatives of industry and the Iowa Engineering Society. Two representatives of the Consulting Engineers Council of Iowa and the remaining seven include a representative of the certified public accountants in Iowa, the Iowa Manufacturers Association, the Iowa Development Commission, the Des Moines Register & Tribune, and representatives, one each from the State University of Iowa, the State College of Iowa, and Iowa State University outside the college of engineering.

We favor the adoption of the Technical Services Act of 1965. If the act is passed we anticipate the following benefits:

1. It will enable us to more adequately cover an area of great concern to the CIRAS staff and to industry, that of new product development, putting into practice some of the research and development of past and present years.

2. It will allow us to work more closely with the engineering extension service to develop and schedule conferences which will benefit industry.

3. It will aid us in working out a cooperative program with the other educational institutions in the State of Iowa.

4. It will promote a closer tie and ultimate regional development between neighboring States.

5. It will enable us to establish a much more personal distribution system for research and development information available currently through the Federal Government.

6. This act will offer an incentive for establishment of industrial service centers in those States currently without such groups.

7. Existence in all States of these groups will greatly facilitate the application of past, present, and future research development.

These are only a few of the obvious benefits which such a program would offer to the States. It could serve to aid in opening up a new channel of communication between industry, the Federal Government, and the individual States.

Mr. MACDONALD. Thank you very much for your fine statement, Mr. Wegner.

I was wondering why Iowa would actually benefit from this since they seem to be doing very well in this field at the moment.

Mr. WEGNER. We very definitely need some expansion in some areas. As I indicated we need to be able to work on product development.

Mr. MACDONALD. How would this bill affect that?

Mr. WEGNER. If we could work on a matching-fund basis with what we have and what they had authorized in the State legislation, we then could to more work in this area.

Mr. MACDONALD. Presently, how much is allocated to you from the State budget per year?

Mr. WEGNER. We started with \$100,000 the first year and \$150,000 for the present year and the budget will be very similar to this in the next biennium.

Mr. MACDONALD. As I understand it, the Federal Government would contribute between \$100,000 and \$150,000 each year.

Mr. WEGNER. That is right.

Mr. MACDONALD. Therefore you would be able to double your service?

Mr. WEGNER. Double the service; that is right, sir.

Mr. MACDONALD. Do you think that this is necessary or do you think what you are doing now pretty well covers the needs of the people of Iowa?

Mr. WEGNER. We are very definitely limited, sir. We need to have a more adequate distribution system for the information that is coming out of Washington, for instance. We also need to have or rather we are doing practically nothing in product development now because we just do not have the staff or facilities to do it.

Mr. MACDONALD. What is product development?

Mr. WEGNER. Product development is taking an invention after you have a model or a prototype and getting it to the point where it is ready to be manufactured. There are many things that have to be eliminated and improved on an invention or product before it goes into manufacturing and the start of spending a lot of money on tooling by the industry.

Mr. MACDONALD. You mean to say someone invents a new sort of machine?

Mr. WEGNER. That is right.

Mr. MACDONALD. And you would aid him in getting that produced?

Mr. WEGNER. We will try to get him—if he does not have the money to develop this and there are a lot of people that come into this picture without a dime—if through the elimination of a lot of products we come up on some two or three that need further development, we will take it just as far as we have to before that can go to an industry. This is what we hope to do with this type of thing.

Mr. MACDONALD. What form does your aid take in product development?

Mr. WAGNER. So far we have one firm in the State of Iowa that does this type of thing. So far the people that have had products have been able to pay a small amount for this development, and this firm has been able to take care of it.

We have done about three projects that we have worked with our own people. We have had to use part of our small budget to develop

this and one of them will result in a new industry in the State within the next 6 months.

Mr. MACDONALD. I am just taking this because I am sure when and if we bring this to the floor we will be asked similar questions. If the Federal Government comes into the picture as they would under this bill, who would approve what you are doing with the money?

Mr. WEGNER. The designated institution.

Mr. MACDONALD. It would not be controlled, as you see it, from Washington.

Mr. WEGNER. No, absolutely not.

Mr. MACDONALD. I hope you spread that gospel to your Iowa delegation because I know at least two of the members of the delegation will raise this question.

Mr. WEGNER. I would love to know this because we have talked to them and the bill is very definitely set up so that it is to be controlled by the State designated institution. This is the way it should be very definitely.

I feel quite strongly about this, as you can tell, because it could not have any other controls, really.

Mr. MACDONALD. No other controls are necessary.

Mr. WEGNER. That is right.

Mr. MACDONALD. And none are provided in this bill as you read it.

Mr. WEGNER. That is right. You will notice that I differed a little with the previous speaker in that I believe a broad brush in the bill will enable you to get this program underway and will end up in a better use of this program.

Mr. MACDONALD. Since we are exchanging information, I can also point out to you that a very broad brush makes it very difficult to pass a bill on the floor of the House.

Mr. WEGNER. I understand that, sir.

Mr. MACDONALD. Mr. Curtin.

Mr. CURTIN. Thank you, Mr. Chairman.

Aside from the product development angle of your work, it appears to me that the main purpose of CIRAS is to conduct a rather elaborate referral service.

Mr. WEGNER. Yes; this I would say is better than 50 percent of our work at the present time.

Mr. CURTIN. Is it a situation of some industry or some business having a problem, so they get in touch with you and you refer them to the proper consultants who you feel can help them?

Mr. WEGNER. Yes.

Mr. CURTIN. Do such people pay those consultants?

Mr. WEGNER. Yes; they develop a contract between the industry and the consultant and then we step out of the picture.

Mr. CURTIN. Do you people get a part of that fee?

Mr. WEGNER. No; no fee at all.

Mr. CURTIN. What has it cost you to run CIRAS since you have been organized?

Mr. WEGNER. \$100,000 in the first year and \$150,000 this year and our budget will be comparable, \$150,000 plus just a little bit for the next biennium. That is \$150,000 a year.

Mr. CURTIN. On this product development idea—do you get any reimbursement for the money you have had to spend in that feature of your work?

Mr. WEGNER. This is a detail we are working on. This is one of the real problems this advisory council will have to take hold of and help me with, because trying to determine where and how these charges are to be made is a detail that will be taken care of. Believe me every product does not develop and become a success. If we spend some money on a product and it becomes a success and they start making profit there should be some means provided whereby they would pay back the cost of the job that CIRAS has done for them.

Mr. CURTIN. Then it is your ultimate plan, that you would be reimbursed for any outlay you have made in this product development feature of your work?

Mr. WEGNER. That is right.

Mr. CURTIN. That is all, Mr. Chairman.

Mr. MACDONALD. Mr. Farnsley.

Mr. FARNSLEY. Thank you, Mr. Chairman.

When you say industry, does that include the service industries?

Mr. WEGNER. Yes. We stay with the SIC classification which is used here in Washington. We feel we have to do this because the Iowa Development Commission is also in the same classification. We cover and once in awhile it becomes a bit obnoxious to some of the fieldmen because I ask them to call on some of the industries that they feel we are not going to have any calls from, but we feel we have to make and have in our record every classification that they include in their record and the SIC classification.

Mr. FARNSLEY. I do not know anything about that. That covers everything?

Mr. WEGNER. That covers just about everything that you can think about on this type of thing. We work through out services I think more closely through getting the information on our retrieval system where we think we will be able to use their services and to refer clients to them to solve problems.

Mr. FARNSLEY. When you say services, you have lost me.

Mr. WEGNER. By services, I am thinking in terms of the CPA's and groups like that. Is this what you are thinking of, sir?

Mr. FARNSLEY. No. I am sorry.

Mr. WEGNER. What were you thinking of?

Mr. FARNSLEY. I am such a laymen, I cannot even ask the question. When I think of service industries, I think of restaurants, drycleaners, colleges, and things like that.

Mr. WEGNER. We do not go into the business areas at all such as merchants and this type of thing.

Mr. FARNSLEY. You call that business rather than service industry, is that right?

Mr. WEGNER. Right.

Mr. FARNSLEY. When I listen to you, I think schools of engineering should be in charge. When I listen to other people from the business schools, I think they should be in charge. So, I am open on this subject.

Is there a conflict? Are there two different areas, or what is it all about?

Mr. WEGNER. I do not think there has to be a conflict at all, Mr. Farnsley. Actually, one or the other has to be the designated institution, as I see it, and that institution then has to pull this program

together, utilizing every one of the other service groups such as the school of business and this sort of thing. We do not have a school of business at Iowa State, but the State University of Iowa does have a good school of business. If we are named as the designated institution, we will work in the 5-year plan a program utilizing all of their services. When a problem comes up for the school of business, we will refer to them this problem.

Mr. FARNLEY. I am not trying to put words in your mouth. I'm really trying to learn. Is it possible that the school of business concerns itself more with what I call service industries and you call business, and the engineering concerns itself more with manufacturing, which you call industry?

Mr. WEGNER. There is no separation of it, sir. They tie so closely together.

Mr. FARNLEY. You are a Governor, and you have in your State a school of business and a school of engineering, both of equal competence. Which do you designate?

Mr. MACDONALD. Which did you graduate from?

Mr. WEGNER. I would definitely say the engineering. Let me elaborate a bit on that, if I may. We have found that in the inquiries we have had, a much higher percentage of them are in the technical area. By technical, I mean those whereby we would have to go to the college of engineering for help if we could not find a consultant. I would say that definitely it would belong in the school with a college of engineering.

I am not saying it would not work the other way, because one of them has to take the lead and utilize the other facility. Of course, I am prejudiced.

Mr. FARNLEY. An engineer can advise you on things that I would call economic, and in sociology.

Mr. WEGNER. Right. We would go into the science and humanities group for help in that. I think you might be interested, too, that we have crossed every line at the university on inquiries that have come to us. We have gone to the psychology department. We have had to go to the agriculture department. We have had to go to the home economics department. We find it has to be crossed this way.

Mr. FARNLEY. Thank you, sir, for your testimony.

Mr. MACDONALD. I would like to add that I think Mr. Farnley has a very good point. It seems to me the training given by a business school and that given by a school of technology are completely at opposite ends of the pole. I did not write the bill, and perhaps I should be directing this question to the Department of Commerce, who are so interested in it, but there seems to me to be a great divergence in the skills of, say, the Massachusetts Institute of Technology and the Iowa business school.

Mr. WEGNER. As I see this bill, it is to set up an organization whereby these things can be tied together. I think this is a decision the Governor has to make as to who can best tie it together.

Mr. FARNLEY. But he is a layman. He does not know.

Mr. WEGNER. He has to have his advisers.

Mr. FARNLEY. Who are always laymen.

Mr. WEGNER. I do not believe it has to be separated as a school of business and a school of engineering.

Mr. MACDONALD. It is in the bill.

Mr. WEGNER. It is. It says they must have a school of business or a college of engineering. This is one of the requirements. The way I reason it out is that they believe these are the two areas—and we have found this to be true—either the technical design area or the marketing and business area. We think these are the important ones. One of these groups should be in charge of administering this bill for you in the State.

Mr. MACDONALD. Would you think a compromise the grouping of a business school plus a school of technology, would be more sensible?

Mr. WEGNER. I do not think it is necessary. I think if you have one organization—

Mr. MACDONALD. For example, I am sure I could name you thousands of graduates of Harvard Business School who would not know a machine tool from a rivet.

Mr. WEGNER. Right.

Mr. MACDONALD. How can they advise on problems that deal with production?

Mr. WEGNER. They must have on their staff either an engineer or a person with technical background so they can have that service available. I have a man on my staff who is an industrial engineer and is a Harvard School of Business Administration graduate.

Mr. FARNSLEY. He is both?

Mr. WEGNER. He is both, yes, sir.

Mr. MACDONALD. But that is unusual.

Mr. WEGNER. This is unusual.

Mr. FARNSLEY. How much staff do you have?

Mr. WEGNER. I have nine men and two women. Of those nine, four are field representatives.

Mr. FARNSLEY. Can you run down right fast their training? Yours is engineering?

Mr. WEGNER. Mine is civil engineering with background in construction, design, and municipal administration. I just told you about this industrial man with a business background. I have a man with a major in marketing and advertising, and a minor in economics. I have a mechanical engineer. In the field I have a civil engineer who has had experience in industry. I have an industrial administrator which basically is school of business type of development. I have an industrial engineer, and I am getting an agricultural engineer with a background in agricultural product development. Then I have a chemical engineer who has joined us from the rare earths field of industry.

Mr. MACDONALD. Yours is a type of operation that is not spelled out in this bill, because by the terms of the bill it says the Governor shall appoint an instrument of the State, either an accredited engineering school or an accredited business school. What you are saying and what you have done seems very reasonable. You have gotten people from different skilled backgrounds. I do not see that the Massachusetts Institute of Technology, as a concrete example, if designated by the Governor of Massachusetts, would then go and get a lot of people from the Harvard Business School to help them.

Mr. WEGNER. If they do not have an adequate budget to have a staff similar to this.

Mr. MACDONALD. I think they have the budget.

Mr. WEGNER. I think they could handle it, but I am thinking of smaller areas where they have only one man or a man on half time from one of the colleges to do this type of job. If this is the situation, then they have to do just what we have done, develop a roster of the availability of the talents in the State that they represent. You do with what you have, and then you do the best you can with the funds that are available.

Mr. MACDONALD. Mr. Keith, have you any questions?

Mr. KEITH. No questions, Mr. Chairman.

Mr. FARNSLEY. I might ask one more question. You say you have an industrial management man. What kind of school did he go to?

Mr. WEGNER. He took industrial administration at Iowa State.

Mr. FARNSLEY. That is not in either the business or the engineering school?

Mr. WEGNER. It is in the science and humanities at the present time.

Mr. FARNSLEY. So, of your whole staff, you have one man out of business school and one man out of science and humanities, and the background of the rest is engineering, except that one engineer has another degree.

Mr. WEGNER. Right.

Mr. FARNSLEY. I bet the guy who came from the school of business has his staff set up the same way. I am not fussing, but this is just the way things work. Believe me, I am a friend. The engineer's chief competence is in design and what, did you say?

Mr. WEGNER. In design and product development and administration.

Mr. FARNSLEY. What does that mean?

Mr. WEGNER. I should change that. In production line management. This is work in the industry itself, out in the factory.

Mr. FARNSLEY. How much competence does the engineer have in what you call business and I call service industry?

Mr. WEGNER. We try to find men who have a background in some of this, but their training does not always indicate that.

Mr. FARNSLEY. The school of business would be the first place to go to for that?

Mr. WEGNER. Right. That is where I would go for my help.

Mr. FARNSLEY. What percent of the dollar gross national product, if you know—there is no reason you should—is manufacturing and service?

Mr. WEGNER. I can tell you how they compare in two areas in Iowa, for instance. The two areas that we are talking about are agriculture and industry products. In 1964, the actual cost of the products of agriculture was \$2,600 million; and this has pretty well leveled off on a plane. Then for 1964 the value of the products of industry amounted to \$8 billion, and we are on a rising curve there. This does not answer your question.

Mr. FARNSLEY. When you say "industry," you mean "manufacturing"; do you not?

Mr. WEGNER. Yes.

Mr. FARNSLEY. Fortune magazine said a few months ago, projecting some work done by a man at Princeton, that "by 1985, one sector of the service industry," which they call the "knowledge industry," which is schools, colleges, publishing, radio, and television, "would be

half the gross national product." That leaves all the other service industries—stores, beauticians, you name it—and manufacturing was a small segment.

Mr. WEGNER. I cannot argue with that, sir.

Mr. MACDONALD. Thank you very much, Mr. Wegner.

Mr. Donald Marlowe, dean of engineering and architecture of Catholic University, and chairman of the Legislative and Government Affairs Committee of the National Society of Professional Engineers.

STATEMENT OF MILTON F. LUNCH, GENERAL COUNSEL, NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS, ACCOMPANIED BY WILLIAM D. PATTON, LEGISLATIVE COUNSEL

Mr. LUNCH. Thank you, Mr. Chairman.

I am not Dean Marlowe. I regret to say he could not return to day, Mr. Chairman, because of a conflicting engagement, and I have been requested by him to present his statement on behalf of the society, if that is agreeable to the committee.

My name is Milton F. Lunch. I am general counsel of the society. I have with me Mr. William D. Patton, who is the legislative counsel of the society. I will read Dean Marlowe's statement.

Mr. Chairman and members of the subcommittee, I greatly appreciate the opportunity to present the views of the National Society of Professional Engineers on H.R. 3420, the proposed State Technical Services Act of 1965.

My name is Donald E. Marlowe. I am dean of engineering and architecture at Catholic University, a registered professional engineer, and chairman of the Legislative and Government Affairs Committee of the National Society of Professional Engineers.

Our society is composed of more than 63,000 members, all of whom are qualified under applicable State engineering registration laws. The society's membership is affiliated through 53 State and territorial societies, and more than 450 local chapters.

We are particularly interested in the program proposed in H.R. 3420 because of its potentially great impact on the entire engineering profession. As a technical information dissemination program—which is what we have been told by administration officials is intended—we believe it would be of great benefit to industry, to the engineering profession, and to our society as a whole. However, if administered to provide federally subsidized technical or engineering services in direct competition with private firms or individuals, we believe the program would be highly detrimental, not only to the engineering profession but to the entire system of American enterprise intended to be helped by the bill.

Our society's views on this legislation can best be understood by reference to a policy statement approved by our executive committee on April 7, 1965, dealing with Federal assistance to States for engineering information dissemination programs. That policy statement reads:

The National Society of Professional Engineers endorses legislation and other activities designed to stimulate and assist the dissemination of current engineering information to industry through State educational institutions and other sources at the State or local level.

Federal assistance to the States for this purpose will serve to stimulate the economy and the efficient use of engineering technology and will be to the benefit of the general public through higher levels of employment, improved standards of living, and more efficient production for a competitive position in world markets.

Legislation to accomplish this purpose should insure that the Federal Government, through its financial assistance does not support engineering research or provide services to proprietary interests. Engineering information gathered and disseminated under the program should be made available to the general public and industry on a broad and general basis. An advisory council, including representation from the engineering profession, and industry, should be established at each level of operation of the program to monitor it for policy guidance and general direction.

Measuring the provisions and stated purpose of H.R. 3420 against these general principles, the National Society of Professional Engineers endorses the bill and supports its enactment. We strongly urge adoption of certain clarifying language, however, to assure that the bill will fulfill its intended information purposes and not be used as authority for Government-financed competition with private firms and individuals.

"TECHNICAL SERVICES"

We recommend that the phrase "technical services," where it appears throughout the bill, including the title set forth in section 19, be amended to read "information services". While this is basically a change in form, and not in substance, we believe it is very important, and would help materially to assure the correct interpretation and application of the bill's provisions.

"Technical services" are defined in section 2 on page 2, line 15, of the bill as "activities or programs designed to enable business and industries to acquire and use scientific and engineering information effectively" through various designated means. The emphasis throughout the bill itself, is on the dissemination of information. Even the preface to the bill states that its purpose is "to promote economic growth by supporting State and regional centers to place the findings of science usefully in the hands of American enterprise." The use of the term "technical services," then, introduces ambiguity which we feel is dangerous. Technical services, in its common meaning, implies services such as those rendered by professional engineers and other technical people in private practice.

Since the phrase "technical information" more accurately describes what is intended, we urge that it be used instead. This will help avoid the danger of the bill's being misinterpreted to put the Government in direct competition with engineers in private practice.

SECTION 5(e)

We recommend, too, that section 5(e) which is on page 7, line 5 of the bill, be amended to eliminate several similar ambiguities. That section now provides that the Secretary of Commerce shall not accept an annual program for approval unless it is certified that the administering institution has "determined that such * * * program does not provide a service performed as practicably by private technical services, professional consultants or private institutions." This language is a highly important part of the bill. It constitutes the only specific safeguard against possible use of the legislation as authority for providing services in competition with private firms or

individuals. Yet, the limiting phrase "as practicably" is so subjective, and subject to such broad interpretation, that it would give the administrator in each State almost complete and unlimited discretion in applying—or not applying—the entire section in any given case. While some discretion is necessary in the administration of any legislative program, we believe that "as practicably" is far too broad, and that a different standard should be provided.

Another ambiguity in section 5(e) is created by use of the word "performed." This word apparently would include services which have been performed, or which are being performed, but it would seem to exclude services which may be performed. Since there are many services which are not actually being performed by private firms or individuals today, but which readily can be, when the need arises, we feel the word "performed" should be eliminated from the bill. Otherwise, it could result in the development of Government-financed competition with professional engineers in private practice.

Both of these potential problems—created by the phrase "performed as practicably"—could be avoided, we believe, by changing section 5(e) to read: "determined that such program does not provide a service available from private technical services, professional consultants or private institutions."

SECTIONS 5(f) AND 2(a)(2)

The other amendments our society feels are necessary relate to section 5(f) and section 2(a)(2) of the bill.

Section 5(f) on page 7, line 9 of the bill, requires that when an annual program is submitted for approval the State certify that the administering institution has "planned no service specially related to a particular firm or company except insofar as the services are of general concern to the community, State or region." We fully support the portion of this section prohibiting services specially related to a particular firm or company. However, we feel the exception which follows is so broad that it weakens the prohibition almost to the point of destroying it. Practically all technical information services—whether they are specially related to a particular firm or not—can be held to be of general concern to a community. We recommend that this exception be dropped, and that section 5(f) simply require the State to certify that it has "planned no services specially related to a particular firm or company, public work, or other capital project." We suggest that "public work or other capital project" be included so that the section will conform to other provisions in the bill limiting services to businesses and industries.

Finally, we recommend that subsection 2(a)(2) which is on page 2, line 21, be reworded to clarify its meaning and thereby reduce the possibility of its being interpreted as authorizing services in competition with private firms and individuals. We suggest that this part of the definition of technical services—or, to use our recommended language, "information services"—be revised to read: "establishing State or regional technical information centers to prepare and disseminate reports, abstracts, computer tapes, microfilms, reviews, and similar scientific and engineering information." This change, we believe would make the meaning of the subsection clearer, and bring language into greater conformity with the other parts of section 2(a).

In brief summary, Mr. Chairman, the National Society of Professional Engineers supports enactment of H.R. 3420, but urgently recommends adoption of the clarifying amendment we have proposed here to help assure that the legislation achieves its intended purpose. With these amendments we think this would be an excellent bill, and one which recognized and protected the diverse interests involved, while helping to provide industry with the scientific and technological information it must have if our economy is to prosper and grow.

We appreciate this opportunity to present our views on this important legislation, and will be happy to furnish any additional information or comment the committee may desire.

With the committee's permission, I would like to submit for the record, and for the committee's convenience, a 1-page attachment to this statement listing the specific amendment we have proposed.

Mr. MACDONALD. Without objection, the attachment will be included in the record at this point.

(The material follows:)

AMENDMENTS TO H.R. 3420 PROPOSED BY THE NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

1. Substitute "technical information" for "technical services" throughout the bill as follows:

Page 2, lines 5, 11, 15.

Page 4, lines 10, 21.

Page 5, line 22.

Page 6, lines 11, 16, 24.

Page 7, line 7.

Page 8, lines 13, 18.

Page 9, line 6.

Page 10, lines 10, 20.

Page 11, lines 3, 12-13.

Page 12, line 25.

Page 13, line 12.

Page 14, lines 8-9.

2. Amend section 5(e) to read: "(e) determined that such program does not provide a service available from private technical services, professional consultants or private institutions."

3. Amend section 5(f) to read: "(f) planned no services specially related to a particular firm or company, public work or capital project."

4. Amend subsection 2(a)(2) to read: "(2) establishing State or regional technical information centers to prepare and disseminate reports, abstracts, computer tapes, microfilms, reviews, and similar scientific and engineering information."

Mr. MACDONALD. You have certainly stated the position of the National Society of Professional Engineers very clearly, but I have some questions in my own mind if the position is correctly stated.

As written, you feel, apparently, that the bill would put the Federal Government or the State government in direct competition with engineers? I do not quite understand that.

Mr. LUNCH. We suggest, Mr. Chairman, that it would be possible. This would be administered at the State level, and we read the language of the bill that it would certainly be possible under the present wording in some places for a designated institution in its program to undertake engineering-type programs which are normally performed by private consulting engineers.

Let me give you a specific example. The language in the bill refers, as I read in the statement, to an exception. You recall there is a prohibition that the plan may not include certain types of services.

Then there is an exception which says, paraphrasing, except where it is in the broad general community interest. Under this exception it is certainly possible, as we read it, that an institution in a State could say:

A certain city, a small municipality in a State, needs a new water system. Under this bill we can provide this service. We can design a new water system for this community.

We are told by the administration officials with whom we have conferred that this is not the intent; that this is not the purpose. We are sure this is correct, but we suggest that the language of the bill be a little more specific to avoid the possibility of this type of thing occurring.

Mr. MACDONALD. Actually, unless my analogy is incorrect, you would say that a lawyer hired by the Government to work for the Government, in the service of the Government, say a labor lawyer working for the National Labor Relations Board, who helps individuals who need help because the law has been broken, would be in competition with private lawyers. Is that right?

Mr. LUNCH. If I follow your analogy, which I think may be a good one, Mr. Chairman, having some relationship myself to the legal operations, a lawyer for the National Labor Relations Board will certainly converse with a person or a firm or a company that has a problem under that law to advise him of what the law provides, what his rights are and what the procedures are in administering that law. This is perfectly proper, normal and accepted.

On the other hand, if this lawyer working for the NLRB undertook in the name of the NLRB to go out and consult with a private company on its labor relations policies, I think you would hear quite an uproar from the American Bar Association.

Mr. MACDONALD. On the contrary, it happens every day, because usually a company has a private law firm representing them. When the law has been violated or there is reason to believe that perhaps it has been violated, that is exactly the process that is followed.

Mr. LUNCH. Right.

Mr. MACDONALD. The Government lawyer talks to the company's lawyer and either he gets them to change what they are doing or, if they insist on doing it, he brings it to a forum in which it is decided who is right, the Government lawyer or the company lawyer.

Mr. LUNCH. I am afraid I did not make my distinction clear. This is all in connection with whether the company has violated certain provisions of the Labor Relations Act. It is the function of that agency and, therefore, the function of this lawyer to deal with that problem. My analogy was that if this lawyer from the NLRB, in the name of the NLRB, gave general advice on labor policy to a company, having no relationship to a charge of unfair labor practice or certification of elections or anything else covered by the law, he would be going outside of the function of that agency.

Mr. MACDONALD. I do not want to get involved in these labor relations problems, but once again I point out it is exactly the function of the Board to make known the application of the Taft-Hartley law.

Mr. LUNCH. I agree.

Mr. MACDONALD. He does that. A regional attorney goes out and gives speeches in which he goes into detail about what can and cannot be done under the law.

Mr. LUNCH. We are in full agreement, Mr. Chairman.

Mr. MACDONALD. I will not pursue it because I have made my point.

Secondly, what I had in mind is that it would seem to me that this would give employment perhaps to members of your Society of Professional Engineers by reaching a new market. If the testimony which has been given before the committee is to be believed, and I think it should be believed, it reaches a whole new market of people who have not been able to avail themselves of the services of professional engineers or have not had the money to. That is the intent of the bill, in my judgment.

Mr. LUNCH. We are sure this is correct.

Mr. MACDONALD. I would think it would help the professional engineers, not injure them.

Mr. LUNCH. I think this is true, and I would like to point out, Mr. Chairman, if it is not clear, that we are endorsing the bill.

Mr. MACDONALD. I am happy to hear that.

Mr. LUNCH. We are definitely endorsing the bill. We are only suggesting what we think is some helpful or clarifying language to deal with some concerns that have been expressed.

Mr. MACDONALD. Could I ask you a question on that point? What if all your amendments which have been read into the record and have been made a part of the record in your attachment, are not adopted? Would the engineers still endorse the bill?

Mr. LUNCH. I would say those who are in private practice would be greatly concerned. Frankly, I cannot predict what the society's board of directors would do in the ultimate, but the private practice segment would be concerned about the possible dangers here of opening the door to competition through the Government, which we are told and we believe from the language of the bill is not intended.

Mr. MACDONALD. I am sure it is not intended.

Mr. LUNCH. All we have tried to suggest is that some language changes would help to clarify the meaning and intent of the bill.

I listened with great interest this morning to the discussion and the questions raised by the members of the committee which seemed to me to raise a very fundamental point which I think is relevant to our presentation. That is whether this bill is really a technical information dissemination program, which we understand it to be, or whether it is intended to be something much broader and get into the general areas of aid of all kinds and types to business. I would just like to comment on that earlier discussion, that it seems to us as we read the language of the bill, particularly the definition of technical services which refers to utilization of scientific information, even though business schools are mentioned as being qualified, the real purpose of this bill, as we see it, throughout, is to provide a program of dissemination of technical and scientific information as distinguished from accounting, personnel, labor relations, or other management problems.

I just venture as my own comment—it had not occurred to us in our committee deliberations this was a problem, so this is strictly my own comment, and I address this somewhat to Mr. Farnsley, who indicated considerable interest in this point—that these other areas are being taken care of to some extent through the Small Business Administration programs and perhaps other programs in the Government, and if this element becomes a major factor in the history of this

bill, then I think it is a change from what was originally intended, to open up a complete aid to industry program involving marketing, production, labor relations, legal problems, accounting problems, warehousing, packaging. There is almost no end to the list of problems of industry and of service industries that could be encompassed here if that is the final outcome.

Mr. MACDONALD. Since you are putting it on a very iffy basis, I will ask you an iffy question. If that were the case, do you think it is necessarily wrong per se that the Federal Government or State government try to help business?

Mr. LUNCH. No; I do not think it is necessarily wrong. I know the Government is doing a considerable amount of work in this area today through the Small Business Administration, to name just one. The question before the committee on this point I think is whether they want a broad bill of general assistance of this type or whether, if our understanding is correct, this is to be a limited-purpose bill to provide basically a system for the dissemination of technical information.

Mr. MACDONALD. I know business for many years has said it is discriminated against; that every other segment within the United States is helped and business is not helped.

Mr. FARNSLEY. Persecuted.

Mr. MACDONALD. I would not go that far. Businessmen are not that rabid in any area. But they do feel that they are not helped to the extent others are by the Federal Government.

Mr. LUNCH. Their complaint may be fully justified.

Mr. MACDONALD. I was wondering if you think they should not be.

Mr. LUNCH. No, sir; not at all. I am not saying that. I am merely saying that, to me at least, this is a different concept than the concept that we believe was intended to be written into this bill, which is a bill to provide for the dissemination of technical information to industry through the State institutions.

Mr. MACDONALD. Where does it say that in the bill?

Mr. LUNCH. The definition on page 2, starting on line 15, says:

technical services means activities or programs designed to enable businesses and industries to acquire and use scientific and engineering information more effectively.

Then it spells out the various means of doing this, but that is the basic definition.

Mr. MACDONALD. You are putting emphasis on the word "information," and I would put emphasis on the words "acquire and use."

Mr. LUNCH. You have to say acquire and use something, though.

Mr. MACDONALD. Yes; scientific and engineering information.

Mr. LUNCH. The question, I think, is whether it is contemplated that this language, "scientific and engineering information," would encompass packaging problems. It might be. There might be a technical problem there, or accounting problems.

Mr. MACDONALD. We do not have to read the whole bill, but just paragraph 1:

analyzing programs of regions and industries to determine new opportunities for applying technology.

It is not strictly information.

Mr. LUNCH. Again I come to the definition, Mr. Chairman, which to me is the controlling thing in what they can do under this program. What they can do under this program is provide programs—

Mr. MACDONALD. I think if you go to (4):

sponsoring industrial workshops, seminars, training programs, extension courses, demonstrations and field visits—

Mr. LUNCH. As I see it, these (1), (2), (3), and (4) listed subsections are means to carry out what it says in section 2(a).

Mr. MACDONALD. Which is how to run a business most effectively in a modern technological era. I think that is the sum and substance of the bill. So, it is not just putting out a newspaper saying there are 3 million people with incomes of under \$2,800 in the southeast section of Massachusetts. I think it goes much further than that, and should.

Mr. LUNCH. May I point out, Mr. Chairman, for instance, in subsection (2) under 2(a), again you see the language "and similar scientific or engineering information." Then under subsection (3), "to identify sources of engineering and other scientific expertise." Under (4), referring to the workshops and seminars, "the more effective application of scientific and engineering information." To me, the bill is shot through with this.

Mr. MACDONALD. You emphasize the word "information," and I emphasize the word "application."

Have you any questions, Mr. Keith?

Mr. KEITH. I share your concern for the potential competition that this measure could give to private firms in the business of analyzing problems of regions and industries. The object of such analytical processes to determine new opportunities for applying technology, to acquire and use scientific and engineering information more effectively. What they do to accomplish this very worthwhile objective could be interpreted by industry and private engineering firms as a potential threat to a legitimate business.

I would like to ask you, therefore, the question: Would you, as an association, withdraw your support if none of your amendments prevailed? Would you vote for the bill in its present form?

Mr. LUNCH. Fortunately or unfortunately, I am not in a position to cast a vote.

Mr. KEITH. We are quibbling here. Would you support it, instead of "vote"?

Mr. LUNCH. Yes, I understand your question. I really cannot answer it, Mr. Keith, because this would have to be determined by the society's board of directors. All I can say is that I think, having discussed this at great length with our various committees and groups, the consulting segment would be greatly concerned if something was not written in to clarify what they see is a possible danger.

I would like the record to be clear, Mr. Chairman, that we are not saying this will happen. As a matter of fact, we know it has not happened in the Iowa program. I may be a little prejudiced here because Mr. Wegner is a former vice president of our society, a very esteemed member, and he understands this problem thoroughly and I am sure he would lean over backward to avoid its happening.

I also know in his program, as he stated, this activity in Iowa has actually helped the consulting engineers. There is no question about it.

Mr. MACDONALD. That is the point I tried to make earlier.

Mr. LUNCH. But Mr. Wegner, unfortunately, perhaps, cannot run this program in every State. We have confidence that many other engineers will be just as diligent as he, but there is this potential that in some places, in some circumstances, the program can be interpreted, if I may use the illustration, to provide the design of a water system for a municipality in a State, when this is not intended.

Mr. MACDONALD. Everyone is entitled to their own opinion about a bill and its effect, but I think that is terribly farfetched. Where could be read into this bill that a waterworks system could be prepared by the State together with matching funds from the Federal Government?

Mr. LUNCH. In the language which provides for certain exceptions, which is section 5(f), if I may turn to that. Starting on page 6, section 5 has a number of restrictions. The Secretary will require these to be set out in the plan. Section 5(f) is one of the restrictions.

Plan no services specially related to a particular firm or company, except insofar as the services are of general concern to the community, State or region.

All we are saying is that a water system or a sewer system or a highway system or an electrical system for a municipality is certainly of general concern to the community, and if some administrator wished to do so, he could read this language to say this is a matter of general concern to the community and, therefore, we are not restricted and we can do this.

Mr. MACDONALD. I would point out to you, because you have to read back to the beginning of section 5, any Governor, at least any Governor of Massachusetts, who decided to build a water system for any city or town in Massachusetts would not be reelected.

Mr. KEITH. If he came from Boston?

Mr. MACDONALD. No, it would not matter if he came from Boston or not. Obviously, that is a community responsibility, as you point out. It would take a great stretch of this language for it to fit the illustration you used, to do something for a community which is building a plant or giving that sort of assistance to a community. I respectfully beg to disagree and say that I think you are completely wrong in that interpretation.

Mr. LUNCH. I do not think we disagree too much, Mr. Chairman. I think we agree on the intent. I am glad to have it in the record that this is the intent. Perhaps the only place where we disagree is that we say it could happen.

Mr. MACDONALD. I say it could not happen.

Mr. LUNCH. Similar things have happened under certain statutory language where an administrator at some level reads it a different way than the committee in Congress intended. We are just trying to pin this point down as well as the other main point we make. I think this a basic policy decision for the committee.

Mr. MACDONALD. I agree with you in principle that the bill is written in fairly broad and perhaps too broad language. If I had any fault to find with the bill, and I do have some, it is that it is too broad in language. But I think your illustration is even broader than the language.

Any further questions, Mr. Keith?

Mr. KEITH. No, thank you, Mr. Chairman.

Mr. MACDONALD. Mr. Farnsley?

Mr. FARNSLEY. When you say "industry," you mean manufacturing?

Mr. LUNCH. We understand the bill to be aimed primarily, Mr. Farnsley, at the manufacturing industry.

Mr. FARNSLEY. I am not asking what you think about the bill, sir. In your presentation you use the term "industry." What does that mean?

Mr. LUNCH. I would say it encompasses primarily manufacturing, but may also include transportation, communications, distribution, and similar activities.

Mr. FARNSLEY. The bill says business and industry, so paparently it makes the same distinction you do. All the service industries and everything else, but manufacturing, transportation, and so forth. When the bill says "technical services," this means scientific services, not the social sciences, not psychology. In other words, you consider them not scientific and, therefore, not eligible under this bill?

Mr. LUNCH. They are not.

Mr. FARNSLEY. Is that correct, sir? Is that what you say?

Mr. LUNCH. That is correct. They may be scientific if you think of it in terms of social sciences, but they are not scientific in terms of this bill.

Mr. FARNSLEY. Under this bill, it is not technical.

Mr. LUNCH. That is correct.

Mr. FARNSLEY. I am not fussing. I want to clear it up. I am trying to help you. I am trying to get the engineers out of it. You say that you are afraid that under this bill some State, some administrator, some institution might be tempted to design a waterworks.

Mr. LUNCH. They could.

Mr. FARNSLEY. Which, in your opinion, would be the most apt to be tempted to design a waterworks—the Harvard School of Business or the Massachusetts Institute of Technology?

Mr. LUNCH. That is a loaded question.

Mr. FARNSLEY. Yes, sir.

Mr. MACDONALD. I think there is only one answer.

Mr. LUNCH. Both being very eminent and distinguished institutions, I do not think either one would get involved in a situation like that.

Mr. FARNSLEY. I thank you.

Mr. MACDONALD. Mr. Curtin?

Mr. CURTIN. Thank you, Mr. Chairman.

Sir, if you delete subsection (4) in the description of technical services, does not the remainder of section (a) pretty well define the functions of a private firm of consulting engineers? In other words, do not consulting engineers do practically everything set forth under (a) in behalf of a client, with the possible exception the provisions of subsection (4)?

Mr. LUNCH. I think they do, to some extent at least, not all of them but various private firms often analyze problems of industry or are retained by a regional authority or a State agency or a local agency to make a feasibility study or an economic study. This is very commonly done; yes, sir, (2) preparing and disseminating technical reports. I do not know that that quite fits into our discussion. This is a method of disseminating something which you have

done. Certainly (1) applies to your point. (3) I think very likely would apply to private firms. They could and very often do a research job to identify sources of information. This is not unusual. I agree with you, I do not think (4) applies. Normally a consulting firm would not sponsor or put on seminars, although they might be retained to work up certain technical seminars or programs for industry, for continuing education purposes or something of that nature. But not usually.

Mr. KEITH. Have you heard of Science Research Associates?

Mr. LUNCH. I think I have seen the name or heard the name.

Mr. KEITH. They are an educational consulting firm which does this kind of work that you just referred to. The company was recently picked up by IBM for \$38 million, and is implementing the Job Corps training program for upgrading citizens so they can find jobs in industry. They will undertake any program, I think, without any reservations.

Mr. LUNCH. Yes, I am sure there are many organizations that would undertake and do undertake presently various training programs for various clients.

Mr. CURTIN. So, you are really saying, then, that the description of technical services, with the subsections as is, could apply to the work of a private consulting firm of engineers?

Mr. LUNCH. Yes, sir; I think that is correct.

Mr. CURTIN. In relation to a private contract of such a private firm with a client who wanted certain information?

Mr. LUNCH. I think in many cases they do and certainly they could do almost all of the things that are indicated here.

Mr. CURTIN. That is all, Mr. Chairman.

Mr. MACDONALD. I thank you for appearing before us, and in conclusion I would like to point out the amount of money in the bill I think would vitiate against the problems that your society thinks might occur. There is not that much money involved.

Mr. LUNCH. If I may comment, Mr. Chairman, I think this is an open-end bill as far as money is concerned. There is a provision for \$25,000 to each institution to develop a plan, but the actual implementation program is open end. It merely says Congress shall appropriate such funds as are necessary or some language of that type. This is a general authorization.

Mr. MACDONALD. The authorization would be included in the bill. The Secretary of Commerce yesterday, if I recall his testimony, said that the first year was \$30 million.

Mr. DIXON. He was using the figures \$10, \$20, and \$30 million for the first 3 years.

Mr. MACDONALD. With \$30 million at the top to be spread among 50 States, I do not think you can build many waterworks.

Mr. FARNSLEY. Mr. Chairman, do you think under this bill these agencies could contract to do these things? I think they could. The University of Louisville is working with the engineers all the time. They take contracts to do engineering work. Could not these agencies contract to do engineering work and thereby have extra money?

Mr. LUNCH. I would give my opinion. I think they could, Mr. Farnsley. I see nothing in the bill to prevent the institution from doing some of this function by contract with any other organization, whether it be another university or private firm, or industry.

Mr. MACDONALD. In my discussion with Mr. Wegner, I pointed out that if the Governor of Massachusetts selected Harvard Business School, they would have to contract some things out to engineers because they do not have the engineering services in that business school.

Mr. LUNCH. I would assume it would be contemplated in most programs that there would be some contracting for specialized assistance.

Mr. KEITH. As a matter of philosophy, I would like to ask a question here. In the provision that you mentioned with reference to \$25,000 a year for each of the first 3 fiscal years, without any restriction. It would be an outright grant would it not?

Mr. LUNCH. It is my understanding it would be an outright grant to help the institution develop a plan for submission to the Secretary.

Mr. KEITH. Can you imagine any State anywhere, knowing they could apply for a \$25,000 grant, which is really a \$75,000 grant, not making the application?

Mr. LUNCH. It would be very difficult to imagine that situation. I say this from the standpoint of having been exposed to similar programs over the years. Most States, I think, would logically feel they might as well get their proper share. Congress has authorized it. I do not mean to say this in a cynical way. I am sure the intention in all cases would be to develop a good, constructive program.

Mr. KEITH. It has always been my belief that if any program of this sort is good enough for the State to undertake a serious study, they should be required at least to put up matching funds so the State pays for some of the value it receives. We had this problem, you may recall, Mr. Chairman, in the case of educational TV. The bill originally was written to provide \$10,000 for every State, regardless of whether or not they wanted educational TV or needed it. I feared, and the committee shared my concern, that any State, even though it was working jointly with another State, would find some way to use that \$10,000. The Governor would have the authority to undertake a contract with a private firm to conduct a study which would result in a recommendation to go ahead or not to go ahead with the program which would follow. The same thing could exist here. I am somewhat concerned that any Secretary would make such a broad or unrestricted approach as this.

Mr. LUNCH. This would be a personal opinion, Mr. Keith. I would feel, as you do apparently, that if a State is seriously interested in developing such a program, \$25,000 is not a large sum of money for most States, or I would say even all States, if they are really serious, or half of that amount, for them to put up a matching fund to get the thing started. I would assume that most States would be willing to do this if they were really serious about developing a good program.

Mr. KEITH. We are talking of roughly \$1,250,000 a year times 3, which would be \$3 $\frac{3}{4}$ million.

Thank you, Mr. Chairman.

Mr. MACDONALD. Thank you.

Mr. LUNCH. Thank you very much, sir.

Mr. MACDONALD. The statement of James S. Hostetler, of the New England Council, will be submitted for the record at this point. (The statement follows:)

STATEMENT OF JAMES S. HOSTETLER OF THE NEW ENGLAND COUNCIL

Mr. Chairman and members of the committee, my name is James S. Hostetler and I am appearing on behalf of the New England Council, a private, nonprofit organization with offices in Boston, Mass. The council is composed of 2,200 members drawn from business, labor, education, and government within New England, and is devoted to the development of a sound and dynamic region through utilization of all human, natural, and material resources. With New England's economic development as a focus, the organization seeks to identify the region's broad public interest and to promote appropriate programs of action to implement its findings.

Since its formation at the recommendation of the New England Governors in 1925, the council has sought common, regionwide solutions to the six States' problems and has supported opportunities for regional development. The council is, therefore, interested in H.R. 3420, the proposed State Technical Services Act of 1965.

The proposed bill would authorize the Federal Government to make grants to States to support programs to make better commercial use of the latest findings of science and technology. These technical services programs, planned and executed locally, would put this important information in the hands of local industry and business. To qualify for Federal matching funds, a State would designate an institution or agency to prepare and administer the technical services programs within the State. However, section 7 of the bill would provide authority for two or more States to cooperate to designate a regional institution and 10 percent more Federal assistance would be available for the regional institution through nonmatching Federal grants. All qualified institutions in the State or region could participate.

The rapidly changing role of science and technology and its impact upon economic growth has long been recognized as an important asset in the New England area and the rapid growth of new technical enterprises, many of which have arisen as a result of federally sponsored activities, has made an important contribution to the New England economy. More is possible. In recognition of the increased importance of science and technology in regional economic development, the New England Council has recently established a committee on science and technology under the chairmanship of Richard S. Morse and with representatives from the industrial-academic-financial community. This committee is studying ways to enhance the effectiveness of the New England Council through the improved use of new technology and advanced management concepts. We believe that an important aspect of such activities involves the use of systems management methods and a high order of technical planning on a regional basis.

We fully recognize the importance of Federal activities in the field of research and development and are aware of technological advances resulting from programs of Federal departments and agencies, including NASA, AEC, the Departments of Defense, HEW, and Interior, and others. It is, however, abundantly clear that such activities, regardless of their scientific significance, are, in fact, useful to the community only insofar as new products and processes can be introduced into the civilian sector.

This process of introduction should be accelerated by the proposed bill with at least the following advantages to the New England region:

1. By upgrading further our industries through making more readily available information about recent technological developments, the region's economic and industrial base should be broadened and strengthened.
2. Facilitating the industrial use of new technology and the manufacture of new products should increase employment in the region.
3. The competitive position of New England products should be enhanced on the world market.

Commercially significant products will not evolve from research programs without a strong cooperative effort including universities, communities, industries, and the Federal Government. We think such cooperation to be most effective should take a regional form. Cooperation on a regional scale has become increasingly important in trying to fashion adequate solutions for such complex and diverse problems as ground and air transportation, stream and air pollution, recreation, and power development. New England with its wide experience in successful interstate achievement, can be expected to implement the technical services proposal in a way designed to make maximum use of interstate cooperation.

While New England has unique educational facilities and technical competence, it is important that these resources be made available to the region as a whole,

particularly to areas and industries more remote from and less familiar with advances in science and technology which may have special relevance for them.

With changes in the character of our defense effort and perhaps its dollar value, the problem of technology transfer becomes even more urgent. New England has many examples of large defense facilities or industries dominating a local area's economy. Better diffusion of new techniques and knowledge can help in the diversification and strengthening of local industry and help prevent economic disaster from occurring should a defense slowdown or cutback occur.

Accordingly, we believe H.R. 3420 can contribute to the continuing efforts of New England to find improved means to strengthen all segments of its economy and all geographical units in the region, and in the process make an even more significant contribution to the overall economic growth of the country.

Mr. MACDONALD. All witnesses having been heard, the hearing is adjourned.

(The following material was submitted for the record:)

THE SECRETARY OF COMMERCE,
Washington, D.C., June 22, 1965.

HON. TORBERT H. MACDONALD,
Chairman, Subcommittee on Commerce and Finance of the Committee on Interstate and Foreign Commerce, House of Representatives, Washington, D.C.

DEAR MR. MACDONALD: I am happy to provide you with the additional information you requested in your letter of June 3, 1965, as to our plans for implementing the State Technical Services Act of 1965.

To develop and carry out the Department's responsibilities under the act, I propose to establish a new organizational unit (tentatively entitled the Office of State Technical Services), headed by a Director who will report to the Assistant Secretary for Science and Technology. The Director will be an individual well experienced in engineering or scientific administration, and the position will probably be established at the GS-18 level.

The Office of State Technical Services will be responsible for carrying out all functions under the act. Its major functions will include:

1. Allocation of funds to each State to assist in the development of its 5-year plan for technical services, as authorized by section 11(d); consultation with States on plan development;
2. Review and approval of State plans and programs, and allocation of annual Federal matching grants to designated institutions, as authorized by section 11(a);
3. Development and approval of "special project" grants, as authorized by section 11(b);
4. Encouragement of regional and interstate programs, and allocation of additional 10 percent grants, as authorized by section 8;
5. Development and issuance of rules and regulations pertaining to Federal grants for State technical services, as required by sections 6, 11, and 13;
6. Development of a reference service to assist States to obtain scientific, technical and engineering reports, advice, and consultation, as authorized by section 12.

The act provides that the costs of the first five functions listed above cannot exceed 5 percent of the funds appropriated to carry out activities under section 11. Total staffing for these "direct administration" functions for the first year of the program will be limited to 21, with an additional 11 positions required for the technical reference service.

The Department will take full advantage of its existing staff resources in carrying out the act. Most administrative support services (budget, personnel, etc.) will be obtained from the Department's central administrative staffs. The new Office of State Technical Services will rely on the Clearinghouse for Federal Scientific and Technical Information to service State requests for technical publications and to help stock the technical reference depositories many States will establish. Under the act, the Clearinghouse will also expand its documentation services to cover selected areas of research sponsored by business and universities, as well as federally supported research. The Office of State Technical Services will reimburse the Clearinghouse for these additional costs it will incur, and the Clearinghouse may consequently need to expand somewhat its clerical employment to perform its contracted work. The Office will itself provide, or obtain, the technical consultation, training, and other forms of referral assistance which States request.

The above information covers in part the questions raised in your letter as to the relationship of the Clearinghouse to the State technical services program. The Clearinghouse now has a staff of 292, and a budget of about \$4,400,000 annually. This includes \$1,130,000 in direct appropriations, \$1,100,000 derived from sales of documents, \$2,100,000 estimated reimbursements from the Department of Defense for processing unclassified DOD research reports, and approximately \$85,000 from the National Science Foundation for specialized documentation projects. The predominant functions of the Clearinghouse are the systematic collection, organization, and dissemination of federally supported research reports, and the translation of foreign research and technical journals. Their experience and capability in document storage and retrieval will be of great value in carrying out H. R. 3420, but the Clearinghouse will not be responsible, nor can it be, for the development and execution of the total program envisaged by the act.

The detailed information you requested as to titles, grades, and salaries of the added positions is attached. As in any new program requiring a high level of professional competence, we expect delays in filling many of the positions shown. Therefore, the staffing level indicated would probably not be reached until the program had been in operation for about a year. The grades shown reflect our best estimate at this time, and may vary somewhat, depending upon the duties and qualifications of employees actually selected. Position titles indicate duties required during the setup phases of the program; however, we will stress flexibility and cross-assignments to make maximum use of the small but highly competent staff we expect to recruit.

I appreciate the interest your committee has shown in this act, and hope we have provided satisfactory answers to your questions.

Sincerely yours,

JOHN T. CONNOR,
Secretary of Commerce.

OFFICE OF STATE TECHNICAL SERVICES

Proposed staffing to be built up during 1st year

Title and grade	Number	Annual salary
Director, GS-18	1	\$24,500
Deputy Director, GS-17	1	21,445
Senior program manager, GS-16	3	18,935
Engineering and program analysts, GS-15	6	16,460
Engineering and program analysts, GS-14	6	14,170
Legal adviser, GS-15	1	16,460
Administrative officer, GS-13	1	12,075
Statistical assistant, GS-11	1	8,650
Secretary, GS-9	1	7,220
Secretary GS-7	3	6,050
Clerk-stenographer or clerk, GS-5	4	5,000
Clerk-stenographer or clerk, GS-4	4	4,480
Total	32	

¹ Each.

THE CHAIRMAN OF THE COUNCIL OF ECONOMIC ADVISERS,
Washington, June 7, 1965.

Representative TORBERT MACDONALD,
Chairman, Subcommittee on Commerce and Finance, Committee on Interstate and Foreign Commerce, U.S. House of Representatives, Washington, D.C.
(Attention: Mr. Williamson).

DEAR MR. MACDONALD: I wish to offer this letter in support of H.R. 3420, the proposed State Technical Services Act, and to have this letter placed in testimony.

Technical change has contributed more than any other factor to our longrun economic growth. In its 1964 annual report, the Council of Economic Advisers stated "The crucial element in the rise of our material well-being has been the progressive utilization of our ever-growing store of knowledge of the world in which we live." Since the turn of the century, the Nation's real GNP has grown at an average rate of 3½ percent a year—an eightfold increase within a single lifetime. It is difficult to estimate precisely how much of this growth has resulted from technical improvements and how much has resulted from increases in the

available inputs of capital and labor. However, private estimates have attributed to technical progress as much as one-half of the growth of real GNP or seven-eighths of the growth in real output per man-hour.

Although it is by far the best single measure of longrun growth, real GNP understates true longrun growth in two important respects. First, it takes incomplete account of the value of the many new and improved products that have become available over the years. Second, it does not value the increased leisure which technology has made possible at the same time we have been increasing our production of goods and services. Analysis of real GNP therefore understates somewhat the true longrun importance of technical change.

In the coming years, the Nation will be increasingly dependent on the rapid growth and spread of new technology to maintain a high and sustained rate of economic growth. Since 1957, the economy has operated with substantial slack. Since 1961, primary attention has rightly been directed to fiscal and monetary measures that help to create employment opportunities for idle workers and productive facilities. We have still not achieved our full employment goals and we must not relax our efforts to do so. However, as the gap between potential and actual output is gradually narrowed, greater attention must be paid to measures that will increase productivity, and raise the growth of the potential. Such measures can permit us to extend our 4-year record of rapid and sustained expansion. At the same time, they will help to prevent the buildup of inflationary pressures and they will gradually improve our balance of payments. By speeding the application of new technology throughout the country, the State Technical Services Act should be a major step in this direction.

It is now fully recognized that governments have major responsibilities in promoting the growth and spread of new technology. The Federal Government finances two-thirds of the Nation's vast research and development effort. Governments at all levels make substantial contributions to the financing of our educational system. The State Technical Services Act will provide a unique cooperative State-Federal program, designed to make modern technology available wherever it can be profitably employed. Studies have shown that innovations frequently take years or decades to spread throughout industry. As modern technology becomes more complex and specialized, it becomes more important to have improved channels for its dissemination to all potential users. The State Technical Services Act should provide an important new channel for the rapid spread of modern technology.

The Federal Government has major programs to help speed the development of depressed regions of the country. The availability of technical manpower and specialized technical services is an important factor in developing the potential of low-income areas. By increasing the availability of know-how in all regions of the country, the State Technical Services Act will be an important factor in spreading prosperity to all parts of the Nation. It is important that the act will provide programs that are tailored to local needs and opportunities. This will permit the programs to serve the goal of regional development much more effectively than would be possible by artificially spreading Government research and development contracts around the country. Most Government research and development contracts are intended to further specific national defense and other needs. They should, therefore, be placed where these national needs will be best served. Regional needs can be best met through the State Technical Services Act.

The State Technical Services Act clearly cannot solve all our problems of economic growth. But it can be an important instrument in furthering national and regional growth, price stability, and an improved balance of payments. I hope your committee can report favorably on the bill, and that Congress will speedily enact it into law.

Sincerely,

GARDNER ACKLEY.

UNIVERSITY OF ARKANSAS,
Fayetteville, May 31, 1965.

Mr. W. E. WILLIAMSON,
Clerk, Committee on Interstate and Foreign Commerce,
House of Representatives, Washington, D.C.

DEAR ED: Thank you for your letter of May 24 suggesting that I might like to comment for the record or appear in person as a witness during the committee hearings on H.R. 3420 (technical services). Previous commitments will not

allow me to testify. As you may know, in March of this year I wrote to Oren Harris, chairman of the committee, expressing our interest in and support of the program outlined in the act.

The National Association of State Universities and Land-Grant Colleges has taken the position that the interest of various Federal departments and agencies in extension programs within their particular fields of responsibility—including industrial extension—be recognized and supported either in general legislation or in separate legislation designed as a part of a comprehensive program. We see the Technical Services Act of 1965 as an important part of a comprehensive extension program.

Scientific research and development conducted or supported by Federal agencies are creating new technologies and improved engineering know-how more rapidly than present mechanisms for their general dissemination are making it available to American industry. We believe that the Technical Services Act will create an effective means for placing the findings of science and engineering usefully in the hands of American enterprise.

Developments in the field of agriculture provide ample evidence of the contribution which the Agricultural Extension Service has made in this important aspect of our national life. The means provided by the Technical Services Act for carrying out a comparable function in the industrial, business, and economic areas have great potential for making significant contribution to the economic development of Arkansas and the Nation.

The university has been active in industrial and economic development of Arkansas through programs carried on by the College of Engineering, the Engineering Experiment Station, the Graduate Institute of Technology, the College of Business Administration, the Bureau of Business and Economic Research and the industrial research and extension center. We would welcome the opportunity through cooperation with the Federal Government to expand and strengthen these activities which are so essential to the economic and industrial development of Arkansas.

I am pleased at this additional opportunity you have provided me to express myself concerning the State Technical Services Act. Perhaps this letter may be useful in the hearing before the committee.

Warm personal regards and every good wish.

Sincerely,

DAVID W. MULLINS, *President.*

CONSULTING ENGINEERS COUNCIL,
Washington, D.C., June 21, 1965.

CONGRESSMAN OREN HARRIS,
House of Representatives,
Washington, D.C.

DEAR CONGRESSMAN HARRIS: Consulting Engineers Council has reviewed S. 949 and H.R. 3420, the State Technical Services Act, and is pleased to present to you its testimony on the bill. We respectfully request that you note several suggested amendments at the end of the statement which we sincerely believe will improve the effectiveness of this bill. The following is the prepared statement:

S. 949 and H.R. 3420: To promote economic growth by supporting State and regional centers to place the findings of science usefully in the hands of American enterprise.

Consulting Engineers Council of the United States, represents 1,600 independent firms of consulting engineers in private practice throughout the country. As the national organization representing the private engineering practitioner, CEC supports efforts to speed the economic growth of the country through effective use of our technical and scientific knowledge. Initiative in encouraging and directing a greater distribution of technical knowledge to business and industry will contribute to the expansion of the economy and the growth of our private enterprise system.

This will enhance economic growth and private enterprise only to the extent that it does not at the same time compete with the private business community which it is trying to help. To this extent Consulting Engineers Council cautions against any provisions in this legislation which would result in the providing of technical services by public bodies or agencies or tax-exempt foundations when the same services are provided by taxpaying, private consulting engineering firms and research laboratories.

The providing of technical services to business, industry, and Government is an area in which the private engineering community has long been preeminent. The wide range of highly diversified and specialized professional engineering talent available in private engineering firms and laboratories has in large measure contributed to the Nation's technical achievements and fund of knowledge. Faced with the constant need of maintaining the utmost in efficiency, economy, and expertise, the engineer in private practice has taken an active lead in providing a wide range of specialized engineering services in industrial plant modernization; design of buildings, and the planning and design of public works projects and military installations.

No engineering problem—whether it is the design of a small piece of specialized equipment for automation or the economic feasibility study and planning of a multimillion-dollar hydroelectric powerplant—is outside the expertise of the modern engineer.

To assure that proper safeguards are present in this legislation to preclude Government-financed competition by public bodies with private engineering firms and individuals, CEC suggests the following amendments:

SECTION 5(e)

Change the present wording: "Determined that such technical services program does not provide a service performed as practicably by private technical services, professional consultants or private institutions;" to read:

"Determined that such technical services program does not provide a service that is now available or could be made available as practicably by private technical services, professional consultants or private institutions;"

SECTION 5(f)

Add the italic words to the present wording:

"Planned no services specially related to a particular firm or company *public work, or other capital project* except insofar as the services are of general concern to the *industry and commerce* of the community, State or region;"

The amendment to section 5(e) is suggested to provide for the occasion when a technical engineering service which is not now available is perfected to the point that it is offered as a service to the public. The present wording, it is felt, does not take into account the offering of future technical services.

The amendment to section 5(f) regarding "public work or other capital project" is offered so that the section will conform to other provisions in the bill limiting services to business and industries. The amendment suggesting the addition of the words "industry and commerce" is offered to remove any implication that specific technical services under this act would be provided directly to a community, municipality, State agency, or other public body. Such an interpretation would lead to a direct competition with private engineering firms which perform on a contract basis much of the engineering services for all branches of government at the Federal, State, county, and municipal levels.

In summary, Consulting Engineers Council and the American Council of Independent Laboratories, which represents private laboratories, respectfully recommend adoption of the clarifying amendments to help assure that the legislation achieves its intended purpose. CEC and ACIL believe that this bill, if enacted, will provide encouragement to a broader dissemination of technical knowledge now available in engineering and science.

We would be pleased to know of your views to these suggestions and to benefit by suggestions you may have. We would be most appreciative of any consideration you may give this statement. If CEC can be of any service, we would be most happy to cooperate in any way.

Sincerely yours,

LEONARD K. CRAWFORD, *President.*

MISSISSIPPI RESEARCH & DEVELOPMENT CENTER,
Jackson, Miss., June 17, 1965.

HON. OREN HARRIS,
Chairman, Committee on Interstate and Foreign Commerce, Rayburn House Office Building, Washington, D.C.

DEAR CONGRESSMAN HARRIS: On behalf of the Mississippi Research & Development Center, a State agency doing research dedicated to economic development, I wish to express support of H.R. 3420, the proposed State Technical

Services Act of 1965. The proposed legislation will be a vital step toward establishing the machinery which will enable us, as a country, and us, as a State, to come to grips with the tasks associated with the dissemination of technology and its utilization.

I speak in terms of a "task" because, in reality, it is just that. Today, the United States is making fantastic strides in science and technology, particularly in the research and development effort in space and the military. In doing so, we are also growing in competence and capability to solve problems. Yet, in countless instances, new developments and technological changes do not show up in, or fail to be transferred to, areas of civilian technology. We can draw a comparison, which may not be an infallible one, but which I believe is indicative. For a number of years now, dollars going into R. & D. have been increasing faster than the gross national product. I am convinced that this lack of keeping pace is, at least partially, due to lack of transfer of ideas from one field to another—from those generating and developing them to those who could use them.

The proposed State Technical Services Act would go a long way toward such a transfer as is referred to here. Such a technical services program might be thought of as an extension effort for science and technology and a parallel, although not altogether similar, to the agricultural extension effort. The act would provide for State and regional programs geared, or designed, to serve the various sections of the country (the program serving Maine would necessarily contain features unique for Maine but which, perhaps, would be totally unrealistic for Mississippi—because the industrial problems and opportunities are different).

Mississippi's industrial employment only recently exceeded agricultural employment. Although we would not and should not discount the contribution of agriculture to the Mississippi economy, we must think increasingly of ourselves as an industrial State producing goods and services. It would be our hope that, through such measures as the State Technical Services Act, we could improve the productivity by which goods and services are made available to our people.

I would appreciate your notifying the members of the committee of my support for H. R. 3420 and including this letter in the official record.

Sincerely,

ROBERT F. DYE,

Acting Director of the Center, and Secretary, Mississippi Research and Development Council.

THE THAYER SCHOOL OF ENGINEERING,
DARTMOUTH COLLEGE,
Hanover, N.H., June 8, 1965.

HON. JAMES C. CLEVELAND,
House of Representatives, Washington, D.C.

DEAR MR. CLEVELAND: Thank you for your letter of May 14. It was a distinct pleasure meeting you and to observe your diligent approach to the problems at hand. I am very appreciative of what I saw.

It may be too late to respond to the suggestion that in a Technical Services Act, H. R. 3420, I have reservations about section 5(c) which begins at line 21 on page 6. I suspect that this is intended to prevent a professor from receiving compensation twice for the same service, and of course I heartily concur that this should be prevented. However, section 5(c) jeopardizes any professor who does legitimate consulting work on his own, as he is permitted to do by his university, if his institution is a designated or participating institution. It possibly could make it illegal for him to receive any funds for his consulting work even though that work is separate, independent, and ethically permitted on a consulting contract directly between the professor and an industrial enterprise. If this were narrowly interpreted, by the present wording no professor would be safe in undertaking a consulting contract if his institution belonged to this scheme. It also indicates that he must not maintain any private interest in conflict with his public responsibility. Public responsibility can again be narrowly interpreted if one wishes to hold that a professor should contribute all his efforts free of charge in spite of the fact that consulting work has traditionally been regarded as a commodity in the market.

Thank you again for your interest.

Sincerely yours,

GEORGE A. TAYLOR,
Professor of Engineering and Management.

STATEMENT OF THE NATIONAL ASSOCIATION OF MANUFACTURERS

The National Association of Manufacturers appreciates this opportunity to present its views with respect to the State Technical Services Act of 1965, H.R. 3420. The purpose of this bill is "to promote economic growth by supporting State and regional centers to place the findings of science usefully in the hands of American enterprise."

We agree with the framers of this proposed legislation that "wider diffusion and more effective application of science and technology in industry are essential to the growth of the economy." We do not agree, however, that the proposed legislation is the only or the best means of accomplishing that purpose.

Some supporters of the proposed legislation believe, according to testimony now in the record, that the primary intention of the bill is to provide a "technical information dissemination program." The U.S. Department of Commerce established recently a Clearinghouse for Federal Scientific and Technical Information to disseminate to scientists, engineers, librarians and management, through a monthly publication, new, unclassified Government technical information. It will contain an unduplicated index of the records of the Atomic Energy Commission, the National Aeronautics and Space Administration, and the Department of Defense.

In addition, there are more than 2,600 business and professional publications, serving every conceivable occupation, issued regularly in the United States. Their purpose is to inform those interested in the field of the latest technological developments through articles and advertisements.

Scientific and engineering information, it seems to us, is more widely available today than ever before. If additional dissemination of information was all that was deemed necessary, such a program could be more readily and economically established through State or regional offices of the U.S. Department of Commerce. These offices could gather the material and make it available to all.

The major thrust of the proposed legislation, however, is to make the available scientific and engineering information useful. To this purpose, seminars, workshops, training programs, extension courses, and demonstrations to make the "technical reports, abstracts, computer tapes, microfilm, reviews, and similar scientific and engineering information" more effective are proposed. This, in effect, calls for an education program.

In recognition of this, the bill provides dollar-for-dollar matching grants by the Department of Commerce to the States for the establishment of a technical services program in a university, preferably a State university, or land-grant college. We understand that the total cost of the program would be in the neighborhood of \$70 to \$80 million annually.

The Association of State Universities and Land-Grant Colleges in its support of the proposed act cited the need for large-scale research and development, and stated, "The university can perform for industry the same R. & D. function they have performed so effectively for agriculture."

Others testifying on behalf of universities referred to services that could be provided to business, such as, "research and assistance on technical problems," and "to conduct research and testing programs where necessary."

These institutions, in making the dissemination of the technical information useful to industry, recognize that research, development, and testing are necessary to convert our scientific advances to effective commercial application though these activities are not mentioned specifically under the broad programs to be established under section 2(a)(4) of the proposed bill. To the extent they would be allowed to perform such services with the assistance of Government funds they would be competing with private organizations offering similar services.

Section 5(e) of the bill is designed to prevent any of the broad programs stated in the bill from competing with private enterprise. It provides that the designated institution certify it has "determined that such technical services program

does not provide a service performed *as practicably* [emphasis added] by private technical services, professional consultants, or private institutions." The phrase, "as practicably" is subject to such broad interpretation that State administrators would have almost unlimited discretion. In fact, lower cost, brought about by the subsidization, would undoubtedly be sufficient justification for institution of the proposed programs. This alleged safeguard then provides little, if any, actual protection.

We understand that limited programs of the nature of those to be established by the proposed bill have been operated by some States for a number of years. In addition, numerous colleges and universities offer day and evening extension courses covering a broad range of technologies. Thus, with a high level of technological education available to the businessman if he so desires, the need for this legislation has not been sufficiently justified in our opinion.

We submit that it is not the lack of programs or dissemination of information that limits the growth potential of small business. It is a well documented fact that small business problems center around two factors—lack of management skills, and inadequate financing.

One of the stated underlying assumptions for the need of such a program was contained in the 1964 Economic Report of the President.

"The Federal Government provides major support for the research and development which underlies our striking technological advances. In the past, much of our research and development has been connected with national defense. Now, as military outlays level off, we face—

"* * * a challenge to apply the Nation's growing scientific and engineering resources to new socially profitable uses;

"* * * an opportunity to accelerate the technological progress of our civilian industries."

Approximately \$15 billion is spent annually by the Federal Government for research and development for national security and about \$5 billion is spent by industry for civilian or commercial purposes.

However, under Government research and development contracts the Government in most cases, owns the patents to new inventions which were derived from such expenditures and today the Government owns more patents than anyone else. From time to time the Senate has adopted amendments to bills—which provide Government funds for research and development—that require the Government to take title to all patents resulting therefrom, except under unusual circumstances. A bill, S. 1899, to this effect has been introduced in the Senate.

It is a rare instance, that an invention made in pursuit of national security requirements can be adapted for civilian or commercial use without the expenditure of considerable time and money for further research and development. However, if the Government owns the patent, there is little incentive to make these expenditures if the patent right to exclude others from using the invention is not exerciseable. The rights to Government-owned patents are available to all, but the incentive to risk funds to develop and market such inventions is lacking.

Should Government patent policy, now subject of hearings in the Senate, result in an act to vest the patent rights in most cases in private hands, rather than Government, large research efforts and funds would be employed to transfer the new scientific and engineering discoveries to useful civilian needs. This effort and expenditure would dwarf those contemplated in the proposed legislation.

Since dissemination of technical information is more widely available than ever before, and since no effective safeguard is provided in the bill to prevent subsidized competition to private industry, and since this bill misreads the primary needs of small business, and since "more effective application of science and technology in industry" can be accomplished readily by revision of Government patent policy—we believe the proposed State Technical Services Act of 1965 is an unnecessary Federal operation and should not be enacted.

STATE OF CONNECTICUT,
DEVELOPMENT COMMISSION,
Hartford, Conn., May 27, 1965.

HON. OREN HARRIS,
Chairman, Interstate and Foreign Commerce,
House Office Building,
Washington, D.C.

DEAR CONGRESSMAN HARRIS: It has been brought to the attention of the Connecticut Development Commission that the State Technical Services Act is scheduled for hearings before the House Committee on Interstate and Foreign Commerce during June.

The purpose of this letter is to convey the support of the Connecticut Development Commission for this legislation. The commission believes that the State Technical Services Act will significantly advance Connecticut's economy and, more importantly, the economy of the Nation.

If the Connecticut Development Commission can be of any assistance in attaining the early enactment of this legislation, please do not hesitate to contact me.

Sincerely yours,

LEROY JONES, *Managing Director.*

(Whereupon the subcommittee adjourned at 12 o'clock noon.)

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