U.S. Promotes Spread of Technical Innovation

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Congress in 1965 enacted a little-noticed program to help businessmen and industries gain access to the growing body of nonproprietary scientific and technical information available from both federal and private research and development. On signing the State Technical Services Act of 1965 (S 949 – PL 89-182) into law Sept. 14, President Johnson called it "the 'sleeper' of the 89th Congress." He said, "If we had had this legislation 25 or 30 years ago, we might have prevented the economic depression that today exists in Appalachia."

The Act provided $60 million over three years for matching federal grants to states which established technical information programs in connection with state universities, land grant colleges, technical institutions and business administration schools. Under the state programs, businesses and industries would be appraised of the opportunities for applying new – or even well-established – scientific information and techniques to create new products, improve sales, administration and production methods, and adjust to coming trends in the economy of their state and region.

In connection with the state programs, the Commerce Department would provide a central clearinghouse for collecting pertinent scientific and technological information. At the state level, business-oriented scientific and technical libraries and information services would be established. The states would sponsor workshops, seminars, field visits and similar means of educating administrators and technical personnel.

Trade secrets and other proprietary information would not be available for dissemination under the program, Commerce Department officials explained, but there would remain a vast body of information which was freely available but not widely known. As an example, one official said that a company might be unaware of what computer programming can do in pointing to the best methods of inventory control, warehouse location and production scheduling. But the company's administrators could find out if, under the Act, a state university offered seminars in business application of computer technology.

State, Regional Economic Planning. A major feature of the Act was that it required states which wanted federal assistance to set up five-year economic plans for themselves. The plans would identify the economic resources and problems of the state and region, the major businesses and industries and their resources and problems, and proposed methods of attacking the problems.

The Act also promoted a regional approach to providing technical services and to planning by permitting states to combine their programs. It authorized grants to each state of $25,000 a year, with no matching requirement, for planning purposes. The Commerce Department announced that it planned to spend no more man $2 million a year and no less than $150,000 a year in each state that signed up to provide technical services.

In promoting state and regional economic planning, the Act paralleled the Economic Development Act of 1965, which authorized grants to regional planning commissions modeled on the Appalachian Regional Commission. (See story p. 798)

Innovation, Diffusion. The State Technical Services Act was devised in the office of the Assistant Secretary of Commerce for Science and Technology, which oversees - - among other things - - patent policy and the National Bureau of Standards.

The Act was shaped by two quiet but persistent themes of President Johnson's Great Society program – the need to promote innovation and the need to diffuse the economic and social benefits of the nation to all its regions and classes.

Federal officials pointed out that economic growth comes through innovation. They believed it is the role of the federal and state governments to encourage innovation. This can be done by making innovation more profitable and less disruptive. Into the first category falls current Government policy concerning ownership of patents derived through the use of federal funds, which in many cases permits the inventor to retain the patent rights rather than reserving them to the public. Into the second category fall such programs as manpower retraining and dissemination of information about new technology. (Some critics say Administration patent policy retards diffusion of technology. See stories on patent policy, p. 887 and manpower training, p. 810.)

On the matter of diffusion of scientific and technical knowledge, Jerome B. Weisner, then science adviser to President Johnson, testified Dec. 4, 1963, before the Senate Labor and Public Welfare Subcommittee on Employment and Manpower, "We are now entering a period when our long-term interests demand special attention to the strengthening of scientific and technological capabilities in regions where they do not now exist." Weisner said this was necessary both to encourage the economic well-being of those regions and to develop the needed scientific and technical manpower which the economy required.
In a Sept. 14, 1965, statement, President Johnson ordered the heads of executive departments and agencies, in making research contracts and grants with institutions of higher learning, to give attention to the need of "strengthening academic institutions and increasing the number of institutions capable of performing research of high quality." In a statement, also on Sept. 14, to the Cabinet on the same subject, Mr. Johnson said, "We

must… devote ourselves purposefully to developing and diffusing – throughout the nation – a strong and solid scientific capability, especially in our many centers of advanced education."

(The Act, plus other administration policies promoting diffusion of scientific and technological capabilities, also helped meet complaints of certain areas of the country, such as the Midwest, that they were not getting a fair share of federal research and development funds and so were lagging in new industries. 1964 Almanac p. 450)

Economic Conversion Potential. The Report of the President's Committee on the Economic Impact of Defense and Disarmament, delivered to President Johnson July 30, pointed to another aspect of the State Technical Services Act – its potential in alleviating the economic effect of shifts and reductions in defense spending. The report said the Act, and programs of the Institute for Applied Technology in the National Bureau of Standards "aimed at creating an environment more conducive to technical innovation in industry," would "strengthen civilian demand for R&D (research and development) personnel, thereby helping to assure an adequate demand for the services of scientific and technical personnel at a time when demand for them by defense industry may have leveled off."

By promoting economic planning at the state level, the Act could also help states to anticipate problems that might be caused by the loss of an important defense contract or base.

Back to Top ▲

Provisions

As signed by the President, S 949, the State Technical Services Act of 1965:

Stated that a wider diffusion of science and technology in business, commerce and industry was essential to the growth of the economy, higher levels of employment and the competitive position of U. S. products in world markets; and that the benefits of federally financed and other research must be placed more fully in the hands of American business by means of federally supported state action.

Authorized the Secretary of Commerce to make matching grants of up to $10 million in fiscal 1966, $20 million in fiscal 1967 and $30 million in fiscal 1968 in support of technical service programs approved by the states through designated state agencies. (Planning grants would not require matching.) Permitted him to reserve 20 percent each year for programs which he determined to have special merit or to be otherwise needed.

Defined technical services as "activities or programs designed to enable businesses, commerce and industrial establishments to acquire and use scientific and engineering information more effectively," such as: disseminating technical information by means of reports, computer tapes, microfilms and reviews and the establishment of state or interstate technical information centers; providing a reference service to identify sources of scientific and engineering expertise; and sponsoring industrial workshops, seminars, training programs, extension courses, demonstrations and field visits to encourage more effective application of technology.

Directed the state agency designated as administrator of the technical services program in each state to use the resources of state and private institutions of higher education which offered degrees in science, engineering or business administration in carrying out the Act.
As a condition for federal grants, directed each designated state agency to prepare a five-year plan outlining the economic and technological conditions of the state, taking into account the region's business, commerce and industrial potential and identifying the major regional and industrial problems; directed that the plan would also specify the general approaches and methods to be used in the solution of these problems and outline the means of measuring the impact of such assistance on the state and regional economy; and directed that the plan specify how technical services would be administered and coordinated. The five-year plan could be revised annually. Each state would get $25,000 in non-matching funds to prepare its plan.
Also directed the designated state agency to prepare an annual plan for technical services, detailing specific services and showing how they advanced the five-year plan, containing a budget and indicating specific responsibilities assigned to various institutions in the state.
Directed that the annual plans and the five-year plans be filed with the Secretary of Commerce after clearance by the state's Governor. Directed the Secretary to reject a plan if the services were in competition with privately available services.
Encouraged interstate agreements by two or more states combining and coordinating their technical services programs. A single agency could administer combined programs.
Directed designated state agencies to appoint advisory boards representing community interests.

Back to Top ▲

Background

The Commerce Department Jan. 15 sent to Congress draft legislation to establish a state technical services program. In a transmittal letter, then-Commerce Secretary Luther H. Hodges said the bill would carry out a recommendation in President Johnson's 1964 Economic Report that "the Federal Government should join with private business and our universities in speeding the development and spread of new technology." (1964 Almanac p. 871)
The draft bill, introduced in the Senate (S 949) by Warren G. Magnuson (D Wash.) and in the House (HR 3420) by Oren Harris (D Ark.), was similar in most respects to the final version (see Provisions, above), but it specified that a land grant college or state university would administer the program in each state unless the Governor explained why he had chosen a different agent, and it provided for a five-year program without authorization limits.
In a campaign speech to the Scientists and Engineers for Johnson-Humphrey on Oct. 11, 1964, Hubert H. Humphrey outlined a Democratic program for "obtaining more knowledge and…making sure that all the people reap the benefits." One point of the program was to establish "industrial clinics, taking advantage of the resources in

engineering, business, economics and other academic specialties possessed by our fine universities." (In following up other promises made by Humphrey in the speech, the Administration in 1965 formed a Panel on Invention and Innovation in the National Bureau of Standards. The panel was composed of representatives of industry, commerce and education. It was concerned with finding ways to improve uses of research, including a study of tax policies affecting investment in research.)

The concept of a state technical services program had been promoted by J. Herbert Hollomon, Assistant Secretary of Commerce for Science and Technology, who revived a long-standing argument that the Federal Government should encourage innovation and experimentation in industry in the same way that it has done in agriculture. In 1963 and 1964, Congress rejected Hollomon's requests for modest funds ($6.4 million in fiscal 1964) for a federal civilian industrial technology program to support and encourage research in various industries and to promote the dissemination of information about research. The 1965 state technical services proposal, which concentrated on state action and did not propose any new federally financed research, by contrast was widely supported in Congress. Congress also liked the idea that the program was designed to reap additional benefits from current and past federal (and other) research investments.

Back to Top ▲

Senate

COMMITTEE – Commerce.

HELD HEARINGS – June 8–10 on S 949, as proposed by the Commerce Department.

TESTIMONY – June 8 – Secretary of Commerce John T. Connor said major regional and industrial "imbalances" existed "in our use of advanced technology." He continued, "Some industries are unable to adapt to new technology. Some companies within prosperous industries do not take advantage of the latest technology available. 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. The regions of the country which are economically most successful and the companies and industries that have thrived did not generally achieve their healthy position by discovering new knowledge in a laboratory – they achieved it by putting new or advanced technology to work."

Connor said the legislation would: "help to increase the industrial strength of the entire country, including those areas which are now economically weak…; stimulate an increase in technological manpower and employment opportunities…; enhance our competitive position in world markets….; (and) stimulate creation of new businesses and industries."

Connor said that the high costs of American labor put American products with a high labor content "increasingly at a competitive disadvantage." Moreover, he said, "Imports are successfully competing in our domestic markets, even in high technological products such as machine tools, scientific instruments, office and computing machines, motors and generators, railway equipment and aircraft. European plants are frequently more productive

than our own." Connor said that it appeared on the basis of studies of selected industries that were at least 20 years old that "a few modem plants are highly productive but a large proportion of establishments are using obsolete techniques that reduce their competitive position." He observed that innovation was often risky and costly for a company, but could be encouraged through a federal-state program to spread knowledge of the results of scientific and technological discoveries and opportunities, using the services of universities and technical institutions. As examples, he suggested mat "the principal industry of a state might benefit from demonstrations 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 that "seminars and demonstrations on new welding techniques would be useful" to a variety of local businesses, or that programs might be developed to introduce businessmen to the advantages of computers in planning market surveys or supply distribution.

J. Herbert Hollomon, Assistant Secretary of Commerce for Science and Technology, said that it would probably take five years for all states to prepare plans and start technical services under the program.

Dr. Donald Hornig, special assistant to the President for science and technology, said that since the beginning of World War II, the United States had spent more than $100 billion in public and private funds on research and development, "principally in fields directly related to military hardware but also in pure, unapplied research and to some extent in fields related to civilian applications." He called S 949 an "experiment" to "narrow the gap between what is known and what is used; between the best industrial techniques based on latest technology and outmoded, inefficient practices."

Philip K. Reily, representing the Atlantic Research Corp. of Alexandria, Va., supported S 949 and said he had already helped to organize a regional conference on application of science and technology. He referred to a National Education Assn. illustration of the rate of growth of knowledge and technology which stated that the total body of man's knowledge doubled in the period 1 AD -1750 AD, doubled again between 1750 and 1900, again between 1900 and 1950, and a fourth time between 1950 and 1960.

June 9 − George G. Marra, head of the wood technology section of the Division of Industrial Research, Washington State University, said, "Technical information is now at a flood stage, and the need for it in industry has never been greater…. However, the channels by which the information and the problems can meet have become inadequate." He supported S 949.

The following witnesses also gave testimony supporting S 949 and described efforts in their states in similar programs: Chris E. Barthel Jr., executive director of the Research Foundation of Kansas; Jean Paul Mather, executive vice president of the University City Science Center, Philadelphia, Pa.; Waldo W. Wegner, director of the Center for Industrial Research and Services, Iowa State University; Thomas F. Malone, vice president for

research, Travelers Insurance Co., Hartford, Conn.; and George W. Hubley, director, State of Mary land Department of Economic Development.

June 10 – John P. McGowan, director of the Franklin Institute library, Philadelphia, testified that Franklin Institute had, since its founding in 1824, carried on scientific and technical information services for Pennsylvania. He said the Institute had developed a library with "vast resources" for information on engineering, physics and chemistry and was making this information available to industry through a technical information service. McGowan said that nonprofit institutions, such as the Franklin Institute, should play a role under S 949, as should individual companies with a large store of technical information for sale, and professional societies.

Thomas Marshall Hahn, president of Virginia Polytechnic Institute, representing the National Assn. of State Universities and Land-Grant Colleges, supported S 949. He said, "The universities can perform for industry the same research and development function they have pe-formed so effectively for agriculture."

Donald E. Marlowe, dean of engineering and architecture at Catholic University, Washington, D.C., representing the National Society of Professional Engineers, supported S 949 but said it should place stress on disseminating information, not "services" and avoid competition with consultants and other private firms operating "in the area of the application of advanced scientific and technical information to the problems of industry."

Henry R. Chope, representing the Industrial Nucleonics Corp. of Columbus, Ohio, supported S 949.

Edwin W. Webber, director of interstate relations for the New England Council, stated that a regional technical services program under S 949 would accelerate expansion of the economy of New England.

In a statement filed with the Committee, the National Assn. of Manufacturers opposed S 949, saying that it tended to duplicate existing services provided by government and business. The statement also said that the NAM did not believe additional education and information would stimulate the growth potential of small businesses, because their problems were more related to lack of management skills and inadequate financing.

In a statement filed with the Committee, the Chamber of Commerce of the United States supported S 949 but recommended that the $25,000 in annual planning funds be made contingent upon state matching.

ACTION – The Committee July 1 reported S 949 (S Rept 421), amended to authorize a five-year program with $10 million in the first year, $20 million in the second year, $30 million in the third and $40 million in each of the last two years. The bill also was amended to permit a state to designate any agency, instead of just land grant institutions, to administer its program.

Floor Action

The Senate July 19 passed S 949 by voice vote, without amendment, and sent it to the House. During brief debate, the bill's floor manager, Commerce Committee Chairman

Warren G. Magnuson (D Wash.), said it "uniquely treats the results of science as a national resource, to be diffused more efficiently by state and local action." He said that there was currently "no national effort…to take the results of this federally financed research and development, as well as other significant scientific findings, and put them to use effectively by those who comprehend local needs: by the local businesses, by the industries of states and regions, by local chambers of commerce, by labor, by the universities and by responsible state and local officials." S 949 would do this, he said. Magnuson added that Secretary Connor had stated that no state would be allocated more than $2 million or less than $150,000 in a single year under the program.

Hugh Scott (R Pa.) said the bill could result in the development of new products and "new technologies to aid in the revival of declining industries." He said the bill would be "a great help to the industrial complex of Pennsylvania."

Back to Top ▲

House

COMMITTEE – Interstate and Foreign Commerce.

HELD HEARINGS – July 1–3 on an Administration bill (HR 3420) authorizing federal grants to the states to establish technical services for industry. The bill was identical to S 949. Testimony at the hearings was similar to that delivered before the Senate Commerce Committee (see above).

ACTION – Aug. 19 reported HR 3420 (H Rept 817) with amendments. As reported, the bill differed from S 949 as passed by the Senate principally in providing a three-year authorization of $60 million instead of a five-year authorization of $140 million; and in eliminating a provision which permitted the Secretary of Commerce to provide up to 10 percent in additional funds to regional or interstate technical service programs without a requirement for matching funds from nonfederal sources.

Majority Views. The report said about 28 states currently operated programs to disseminate scientific and technical information to businesses and industries. It said a federal program would entice other states to establish such services and would help existing programs.

The report also said that the Commerce Department would establish an office to coordinate the state programs and provide, in conjunction with the existing Clearinghouse for Federal Scientific and Technical Information, a center for both federal and nonfederal scientific and technological information.

Additional Views. Reps. William L. Springer (R Ill.), Hastings Keith (R Mass), James T. Broyhill (R N.C.), Ancher Nelsen (R Minn.), Albert W. Watson (R S.C.), Willard S. Curtin (R Pa.) and Samuel L. Devine (R Ohio) signed additional views supporting the bill but objecting that there were no safeguards "as to the way the money will be handled in the planning stages." They recommended that plans be required to have a detailed assessment of the needs of the states or regions for the services provided under the bill; that greater recognition be made of a variety of existing federal programs for disseminating scientific and technological material; and that greater recognition be made of "some 300" private and

institutional programs which currently furnished technical services to commerce and industry.

Floor Action

The House Sept. 1 passed HR 3420 by voice vote. It then substituted the provisions of the bill for those of S 949 as passed by the Senate and returned the latter bill to the Senate.

During debate, the bill's floor manager, Torbert H. Macdonald (D Mass.), said the bill would provide businesses and industries with "a new and important pipeline of commercial information. This can serve as a vital stimulus, particularly to the smaller and less sophisticated businesses and industries." He said the Department of Commerce would establish an Office of State Technical Services to "serve as a clearinghouse for information coming in on all…subjects."

The House by voice vote rejected an amendment by Hastings Keith (R Mass.) to require that the $25,000 a year in planning money authorized for each state under the bill be matched by nonfederal funds.

Back to Top ▲

Final Action

The Senate Sept. 7 by voice vote accepted the House version of S 949, clearing the bill for the President's signature.

Bill Signed. The State Technical Services Act of 1965 was signed into law Sept. 14 at the White House (PL 89-182). On signing the law, President Johnson said that 20 years hence, Americans would look back on the bill as the "sleeper" of the 89th Congress.

He said, "The test of our generation will not be the accumulation of knowledge. In that, we have surpassed all of the ages of man combined. Our test will be how well we apply that knowledge for the betterment of all mankind…. This bill will do for the American businessman what the great Agricultural Extension Service has done for the American farmer…. The vehicles for success will be 250 colleges and technical schools throughout the land. They will distribute the information. They will serve as the economic planning centers for their areas…."

Back to Top ▲

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