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CONGRESSIONAL RECORD
PROCEEDINGS AND DEBATES OF THE 99TH CONGRESS

SENATE

BILL	DATE	PAGE(S)
H.R.3773	AUG 9 '86 (109-II)	S11092-104

ACTION:

Federal Technology Transfer Act of 1986: Senate passed H.R. 3773, to amend the Stevenson-Wydler Technology Innovation Act of 1980, to promote technology transfer by authorizing Government-operated laboratories to enter into cooperative research agreements and by establishing a Federal Laboratory Consortium for Technology Transfer within the National Science Foundation, after agreeing to a committee amendment in the nature of a substitute and amendments proposed thereto, as follows:

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Adopted:

(1) Simpson (for Gorton) Amendment No. 2683, of a technical and clarifying nature.

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(2) Simpson (for Dole and Rockefeller) Amendment No. 2684, to provide that in certain research and development arrangements, a Federal laboratory may consider reciprocity of treatment by foreign governments relating to such arrangements and licensing agreements.

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(3) Simpson (for Domenici) Amendment No. 2685, to provide that the consortium shall not engage in the direct transfer of technology, but shall furnish information and respond to requests for technical assistance only as specified, and that the consortium shall use 10 percent of the funds provided to establish demonstration projects in technology transfer.

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(4) Byrd (for Pell) Amendment No. 2686, of a technical and clarifying nature.

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(5) Byrd (for Leahy) Amendment No. 2687, to encourage and assist the creation of centers and other joint initiatives by State or local governments, regional representatives, private businesses, institutions of higher education, non-profit organizations, or Federal laboratories to encourage technology transfer, to stimulate innovation, and to promote an appropriate climate for investment in technology related industries.

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(6) Byrd (for Bumpers) Amendment No. 2688, to require agencies to make a separate determination of the mission or missions of each of their laboratories.

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FEDERAL TECHNOLOGY TRANSFER ACT

Mr. SIMPSON. Mr. President, after conferring with the Democratic leader, I ask unanimous consent that the Senate now turn to Calendar No. 662, H.R. 3773, the Federal Technology Transfer Act.

The PRESIDING OFFICER. Is there objection to the request of the Senator from Wyoming?

Mr. BYRD. There is no objection.

The PRESIDING OFFICER. The bill will be stated by title.

The assistant legislative clerk read as follows:

H.R. 3773 to amend the Stevenson-Wydler Technology Innovation Act of 1980 to promote technology transfer by authorizing Government-operated laboratories to enter into cooperative research agreements and by establishing a Federal Laboratory Consortium for Technology Transfer within the National Science Foundation, and for other purposes,

The Senate proceeded to consider the bill which had been reported from the Committee on Commerce, Science, and Transportation, with an amendment to strike out all after the enacting clause, and insert the following:

That this Act may be cited as the "Federal Technology Transfer Act of 1986".

UTILIZATION OF FEDERAL TECHNOLOGY

SEC. 2. (a) Section 11(a) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710(a)) is amended—

(1) by inserting "(1)" after "POLICY.—"; and

(2) by adding at the end thereof the following:

"(2) Each laboratory director shall ensure that efforts to transfer technology are considered positively in laboratory job descriptions, employee promotion policies, and evaluation of the job performance of scientists and engineers in the laboratory.".

(b)(1) Section 11(b) of such Act (15 U.S.C. 3710(b)) is amended—

(A) by striking "a total amount budget exceeding $20,000,000 shall provide at least one professional individual full-time" and inserting in lieu thereof "200 or more full-time scientific, engineering, and related technical positions shall provide one or more full-time evaluation positions";

(B) by striking "requirements set forth in (1) and/or (2) of this subsection" and inserting in lieu thereof "requirement set forth in clause (2) of the preceding sentence"; and

(C) by striking "either requirement (1) or (2)" in the last sentence and inserting in lieu thereof "such requirement".

(2) Section 11(c) of such Act (15 U.S.C. 3710(c)) is amended—

(A) by amending paragraph (1) to read as follows:

"(1) to prepare application assessments for selected research and development projects in which that laboratory is engaged and which in the opinion of the laboratory may have potential commercial applications;";

(B) by striking "the Center for the Utilization of Federal Technology" in paragraph (3) and inserting in lieu thereof "the National Technical Information Service, the Federal Laboratory Consortium for Technology Transfer,", and by striking "; and" inserting in lieu thereof a semicolon;

(C) by striking "in response to requests from State and local government officials." in paragraph (4) and inserting in lieu thereof "to State and local government officials; and"; and

(D) by adding after paragraph (4) the following:

"(5) to participate, where feasible, in regional, State, and local government programs designed to facilitate or stimulate the transfer of technology for the benefit of the region, State, or local jurisdiction in which the Federal laboratory is located.".

(c) Section 11(d) of such Act (15 U.S.C. 3710(d)) is amended—

(1) by striking all from "(d)" through "shall—" and inserting in lieu thereof the following:

"(d) DISSEMINATION OF TECHNICAL INFORMATION.—The National Technical Information Service shall—";

(2) by striking paragraph (2);

(3) by striking "existing" in paragraph (3), and redesignating such paragraph as paragraph (2);

(4) by striking paragraph (4) and inserting in lieu thereof the following:

"(3) receive requests for technical assistance from State and local governments, respond to such requests with published information available to the Service, and refer such requests to the Federal Laboratory Consortium for Technology Transfer to the extent that such requests require a response involving more than the published information available to the Service;";

(5) by redesignating paragraphs (5) and (6) as paragraphs (4) and (5), respectively; and

(6) by striking "(c)(4)" in paragraph (4), as so redesignated, and inserting in lieu thereof "(c)(3)".

(d) Section 11(e) of such Act (15 U.S.C. 3710(e)) is amended by striking "Center for the Utilization of Federal Technology" and inserting in lieu thereof "Secretary".

ESTABLISHMENT OF FEDERAL LABORATORY CONSORTIUM FOR TECHNOLOGY TRANSFER

SEC. 3. Section 11 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710), is amended by section 2 of this Act, is further amended—

(1) by redesignating subsection (e) as subsection (f); and

(2) by inserting after subsection (d) the following:

"(e) ESTABLISHMENT OF FEDERAL LABORATORY CONSORTIUM FOR TECHNOLOGY TRANSFER.—(1) There is hereby established the Federal Laboratory Consortium for Technology Transfer (hereinafter referred to as the 'Consortium') which, in cooperation with Fedral laboratories and private sector, shall—

"(A) develop and, with the consent of the Federal laboratory concerned, administer techniques, training courses, and materials concerning technology laboratory employees regarding the commercial potential of laboratory technology and innovations;

"(B) furnish advise and assistance requested by Federal agencies and laboratories for use in their technology transfer programs (including the planning of seminars for small business and other industry);

"(C) provide a clearinghouse, at the laboratory level, for requests for technical assistance from States and units of local governments, businesses, industrial development organizations, not-for-profit organizations (including universities), Federal agencies and laboratories, and other persons, and—

"(i) to the extent that a response to such requests can be made with published information available to the National Technical Information Service, refer such requests to that Service; and

"(ii) otherwise refer such requests to the appropriate Federal laboratories and agencies;

"(D) facilitate communication and coordination between Offices of Research and Technology Applications of Federal laboratories;

"(E) utilize (with the consent of the agency involved) the expertise and services of the National Science Foundation, the Department of Commerce, the National Aeronautics and Space Administration, and other Federal agencies, as necessary;

"(F) with the consent of any Federal laboratory, facilitate the use by such laboratory of appropriate technology transfer mechanisms such as personnel exchanges and computer-based systems;

"(G) with the consent of any Federal laboratory, assist such laboratory to establish programs, such as technical volunteer services, for the purpose of providing technical assistance to communities related to such laboratory; and

(H) facilitate communication and cooperation between Office of Research and Technology Applications of Federal laboratories and regional, State, and local technology transfer organizations.

"(2) The membership of the Consortium shall consist of the Federal laboratories described in clause (1) of subsection (b) and such other laboratories as may choose to join the Consortium. The representatives to the Consortium shall include a senior staf member of each Federal laboratory which is a member of the Consortium and a representative appointed from each Federal agency with one or more member laboratories.

"(3) The representatives to the Consortium shall elect a Chairman of the Consortium.

"(4) The Director of the National Bureau of Standards shall provide the Consortium, on a reimbursable basis, with administrative services, such as office space, personnel, and support services of the Bureau, as requested by the Consortium and approved by such Director.

"(5) Not later than 1 year after the date of the enactment of this subsection, and every year thereafter, the Chairman of the Consortium shall submit a report to the President, to the appropriate authorization and appropriation committees of both Houses of the Congress, and to each agency with respect to which a transfer of funding is made (for the fiscal year or years involved) under paragraph (6), concerning the activities of the Consortium and the expenditures made by it under this subsection during the year for which the report is made.

"(6)(A) Subject to subparagraph (B), an amount equal to 0.005 percent of that portion of the research and development budget of each Federal agency that is to be utilized by the laboratories of such agency for a fiscal year referred to in subparagraph (B)(ii) shall be transferred by such agency to the National Bureau of Standards at the beginning of the fiscal year involved. Amounts so transferred shall be provided by the Bureau of the Consortium for the purpose of carrying out activities of the Consortium under this subsection.

"(B) A transfer may be made by any Federal agency under subparagraph (A), for any fiscal year, only if—

"(i) the amount so transferred by the agency (as determined under such subparagraph) would exceed $10,000; and

"(ii) such transfer is made with respect to the fiscal year 1987, 1988, 1989, 1990, or 1991.

"(C) The heads of Federal agencies and their designees, and the directors of Federal laboratories, may provide such additional support for operations of the Consortium as they consider appropriate.".

FUNCTIONS OF THE SECRETARY OF COMMERCE

SEC. 4. Section 11 of such Act (15 U.S.C. 3710), as amended by this Act, is further amended by adding at the end thereof the following:

"(g) FUNCTIONS OF THE SECRETARY.—(1) The Secretary, in consultation with other Federal agencies, may—

"(A) make available to interested agencies the expertise of the Department of Commerce regarding the commercial potential of inventions and methods and options for commercialization which are available to Federal laboratories, including research and development limited partnerships;

"(B) develop and disseminate to appropriate agency and laboratory personnel model provisions for use on a voluntary basis in cooperative research and development arrangements; and

"(C) furnish advice and assistance, upon request, to Federal agencies concerning their cooperative research and development programs and projects.

"(2) Two years after the date of enactment of this subsection, and every 2 years thereafter, the Secretary shall submit a report to the President and Congress on the use by the agencies and the Secretary of the authorities specified in this Act. Other Federal agencies shall, to the extent permitted by law, provide the Secretary with all information necessary to prepare such reports.".

COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS

SEC. 5. The Stevenson-Wydler Technology Innovation Act of 1980 is amended by redesignating sections 12 through 15 as sections 15 through 18, respectively, and by inserting after section 11 the following:

"SEC. 12. COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS.

"(a) GENERAL AUTHORITY.—(1) Each Federal agency may permit the director of any of its Government-operated Federal laboratories—

"(A) to enter into cooperative research and development arrangements (subject to such regulations or review procedures as the agency considers appropriate) with other Federal agencies, units of State or local government, industrial organizations (including corporations, partnerships, and limited partnerships), public and private foundations, non-profit organizations (including universities), or other persons (including licensees of inventions owned by the Federal agency); and

"(B) to negotiate licensing agreements under section 207 of title 35, United States Code, or other authorities for Government-owned inventions made at the laboratory and other inventions of Federal employees that may be voluntarily assigned to the Government.

"(2) Under arrangements entered into pursuant to paragraph (1), a laboratory may—

"(A) accept funds, services, and property from collaborating parties and provide services and property to collaborating parties;

"(B) grant or agree to grant in advance to a collaborating party patent licenses, assignments, or options thereto, in any invention made by a Federal employee under the arrangement, retaining such rights as the Federal agency considers appropriate;

"(C) waive, in whole or in part, any right of ownership which the Government may have under any other statute to any inventions made by a collaborating party or employee of a collaborating party under the arrangement; and

"(D) to the extent consistent with any applicable agency requirements, permit employees or former employees to the laboratory to participate in efforts to commercialize inventions they made while in the service of the United States.

"(3) Each agency shall maintain a record of all agreements entered into under this section.

"(b) DEFINITION.—As used in this section, the term—

"(1) 'cooperative research and development agreement' means any agreement between one or more Federal laboratories and one or more non-Federal parties under which the Government provides personnel, services, facilities, equipment, or other resources (but not funds to non-Federal parties) and the non-Federal parties provide funds, personnel, services, facilities, equipment, or other resources toward the conduct of specified research or development efforts which are consistent with the missions of the agency, except that such term does not include a procurement contract or cooperative agreement as those terms are used in sections 6303, 6304, and 6305 of title 31, United States Code; and

"(2) 'laboratory' means a facility or group of facilities owned, or otherwise used by a Federal agency, a substantial purpose of which is the performance of research and development by employees of the Federal Government.".

"(c) RELATIONSHIP TO OTHER LAWS.—Nothing in this section is intended to limit or diminish existing authorities of any agency.".

REWARDS FOR SCIENTIFIC, ENGINEERING AND TECHNICAL PERSONNEL OF FEDERAL AGENCIES

SEC. 6. The Stevenson-Wydler Technology Innovation Act of 1980, as amended by this Act, is further amended by inserting after section 12 the following:

"SEC. 13. REWARDS FOR SCIENTIFIC, ENGINEERING, AND TECHNICAL PERSONNEL OF FEDERAL AGENCIES.

"(a) CASH AWARDS PROGRAM.—The head of each Federal agency that is making expenditures at a rate of more than $50,000,000 per fiscal year for research and development in its Government-operated laboratories shall use the appropriate statutory authority to develop and implement a cash awards program to reward its scientific, engineering, and technical personnel for—

"(1) inventions, innovations, or other outstanding scientific or technological contributions of value to the United States due to commercial applications or due to contributions to missions of the Federal agency or the Federal Government; and

"(2) exemplary activities that promote the domestic transfer of science and technology developed within the Federal Government and result in utilization of such science and technology by American industry or business, universities, State or local governments, or other non-Federal parties.

"(b) PAYMENT OF ROYALTIES.—Any royalties or other income received by an agency from the licensing or assignment of inventions under this section or under section 207 of title 35, United States Code, or other authority shall be retained by the agency whose laboratory produced the invention, except that beginning with fiscal year 1988, such royalties or other income shall be subject to appropriations, and shall be disposed of as follows:

"(1) At least 15 percent of the royalties or other income received each year by the agency on account of any invention shall be paid to the inventor or coinventors if they were employees of the agency at the time the invention was made. Payments made under this paragraph are in addition to the regular pay of the employee and to any awards made to that employee, and such payments shall not affect the entitlement or limit the amount of the regular pay, annuity, or other awards to which the employee is otherwise entitled or for which the employee is otherwise eligible.

"(2) The balance of any royalties or related income earned during any fiscal year after paying the inventors' portions under paragraph (1) shall be transferred to the agency's Government-operated laboratories with a substantial percentage being returned to the laboratories whose inventions produced the royalties or income. Such royalties or income may be retained by the laboratory up to the limits specified in this paragraph, and used—

"(A) for mission-related research and development of the laboratory;

"(B) to support development and education programs for employees of the laboratory;

"(C) to reward employees of the laboratory for contributing to the development of new technologies and assisting in the transfer of technology to the private sector, and for inventions of value to the Government that will not produce royalties;

"(D) to further scientific exchange to and from the laboratory; and

"(E) for payment of patenting costs and fees and other expenses incidental to promoting, administering, and licensing inventions, including the fees or costs for services of other agencies or other persons or organizations for invention management and licensing services.

If the balance for any laboratory after paying the inventors' shares under paragraph (1) exceeds 5 percent of the annual budget of the laboratory, 75 percent of the excess shall be paid to the Treasury of the United States and the remaining 25 percent shall be used for the purposes listed in subparagraphs (A) through (E), by the end of the fiscal year subsequent to the one in which they were received. Any funds not so used or obligated by the end of such fiscal year shall be paid to the Treasury of the United States.

"(c) ASSIGNED INVENTIONS.—If the invention was one assigned to the agency either (1) by a contractor, grantee, or the recipient of a cooperative agreement of the agency, or (2) by an employee of the agency that was not working in the laboratory at the time the invention was made, the agency unit that funded or employed or assigned the assignee shall, for purposes of this section, be considered to be a laboratory.

"(d) REPORTS.—In making their annual budget submissions, Federal agencies shall submit to the appropriate authorization and appropriations committees of both Houses of the Congress summaries of the amount of royalties or other income received and expenditures made (including inventor awards) under this section.".

EMPLOYEE ACTIVITIES

SEC. 7. The Stevenson-Wydler Technology Innovation Act of 1980, as amended by this Act, is further amended by inserting after section 13 the following:

"SEC. 14. EMPLOYEE ACTIVITIES.

"(a) IN GENERAL.—If a Federal agency which has the right of ownership to an invention under this Act does not intend to file for a patent application or otherwise to promote commercialization of such invention, the agency may allow the inventor, if the inventor is a Government employee or former employee who made the invention

during the course of employment with the Government, to retain title to the invention (subject to reservation by the Government of a nonexclusive, nontransferable, irrevocable, paid up license to practice or have practiced the invention throughout the world by or on behalf of the Government). In addition, the agency may condition the inventor's right to title on the timely filing of a patent application in cases when the Government determines that it has or may have a need to practice the invention.

"(b) DEFINITION.—For purposes of this section, Federal employees include 'special Government employees' as defined in section 202 of title 18, United States Code.

"(c) RELATIONSHIP TO OTHER LAWS.—Nothing in this section is intended to limit or diminish existing authorities of any agency.".

MISCELLANEOUS AND CONFORMING AMENDMENTS

SEC. 8. (a) Section 10 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3709) is repealed.

(b)(1) Section 3(2) of such Act (15 U.S.C. 3702(2)) is amended by striking "centers for industrial technology" and inserting in lieu thereof "cooperative research centers".

(2) Section 4 of such Act (15 U.S.C. 3703) is amended—

(A) by striking "Industrial Technology" in paragraph (1) and inserting in lieu thereof "Productivity, Technology, and Innovation";

(B) by striking "Director' means the Director of the Office of Industrial Technology" in paragraph (3) and inserting in lieu thereof "'Assistant Secretary' means the Assistant Secretary for Productivity, Technology, and Innovation";

(C) by striking "Centers for Industrial Technology" in paragraph (4) and inserting in lieu thereof "Cooperative Research Centers";

(D) by striking paragraph (6), and redesignating paragraphs (7) and (8) as paragraphs (6) and (7), respectively; and

(E) by striking "owned and funded" in paragraph (6), as so redesignated, and inserting in lieu thereof "owned, leased, or otherwise used by a Federal agency and funded".

(3) Section 5(a) of such Act (15 U.S.C. 3704(a)) is amended by striking "Industrial Technology" and inserting in lieu thereof "Productivity, Technology, and Innovation".

(4) Section 5(b) of such Act (15 U.S.C. 3704(b)) is amended by striking "DIRECTOR" and inserting in lieu thereof "ASSISTANT SECRETARY", and by striking all from "a Director of the Office" and inserting in lieu thereof "an Assistant Secretary for Productivity, Technology, and Innovation.".

(5) Section 5(c) of such Act (15 U.S.C. 3704(c)) is amended by striking "the Director" each place it appears and inserting in lieu thereof "the Assistant Secretary".

(6) The heading of section 6 of such Act is amended to read as follows:

"SEC. 6. COOPERATIVE RESEARCH CENTERS.".

(7) Section 6(a) of such Act (15 U.S.C. 3705(a)) is amended by striking "Centers for Industrial Technology" and inserting in lieu thereof "Cooperative Research Centers".

(8) Section 6(b)(1) of such Act (15 U.S.C. 3705(b)(1)) is amended by striking "basic and applied".

(9) Section 6(e) of such Act (15 U.S.C. 3705(e)) is amended to read as follows:

"(e) RESEARCH AND DEVELOPMENT UTILIZATION.—In the promotion of technological innovation and commercialization of research development efforts by Centers under this section, chapter 18 of title 35, United States Code, shall apply.".

(10) Section 6(f) of such Act (15 U.S.C. 3705(f)) is repealed.

(11) The heading of section 8 of such Act is amended by striking "CENTERS FOR INDUSTRIAL TECHNOLOGY" and inserting in lieu thereof "COOPERATIVE RESEARCH CENTERS".

(12) Section 8(a) of such Act (15 U.S.C. 3707(a)) is amended by striking "Centers for Industrial Technology" and inserting in lieu thereof "Cooperative Research Centers".

(c) Section 4 of such Act (15 U.S.C. 3703), as amended by subsection (b)(2) of this section, is further amended by adding at the end thereof the following:

"(8) 'Federal agency' means any executive agency as defined in section 105 of title 5, United States Code, and the military departments, as defined in section 102 of such title.

"(9) 'Invention' means any invention or discovery which is or may be patentable or otherwise protected under title 35, United States Code, or any novel variety of plant which is or may be protectable under the Plant Variety Protection Act (7 U.S.C. 2321 et seq.).

"(10) 'Made', when used in conjunction with any invention, means the conception or first actual reduction to practice of such invention.".

(d)(1) Such Act (as amended by this Act) is further amended by redesignating sections 11 through 18 as sections 10 through 17, respectively.

(2)(A)Section 5(d) of such Act (15 U.S.C. 3704(d)) is amended by inserting "(as then in effect)" after "Act" the second time it appears.

(B) Section 8(a) of such Act (15 U.S.C. 3707(a)) is amended by striking the last sentence.

(C) Section 9(d) of such Act (15 U.S.C. 3708(d)) is amended by striking "or 13" and inserting in lieu thereof "10, or 14".

AMENDMENT NO. 2683

(Purpose: To make various amendments)

Mr. SIMPSON. Mr. President, I send an amendment to the desk on behalf of Senator GORTON to the committee substitute.

The PRESIDING OFFICER. The amendment will be stated.

The assistant legislative clerk read as follows:

The Senator from Wyoming [Mr. SIMPSON] for Mr. GORTON, proposes an amendment numbered 2683.

Mr. SIMPSON. Mr. President, I ask unanimous consent that the reading of the amendment be dispensed with.

The PRESIDING OFFICER. Without objection, it is so ordered.

The amendment is as follows:

On page 33, line 15, insert "personnel," immediately after "funds,".

On page 33, line 16, insert "personnel," immediately after "provide".

On page 33, line 22, insert the following immediately before the semi-colon: ", and subject to reservation by the Government of a nonexclusive nontransferrable, irrevocable, paid up license to practice or have practiced the invention throughout the world by or on behalf of the Government".

On page 34, line 2, insert the following immediately before the semi-colon: ", and subject to reservation by the Government of a nonexclusive nontransferrable, irrevocable, paid up license to practice or have practiced the invention throughout the world by or on behalf of the Government".

On page 34, line 11-12, strike "agreement" and insert in lieu thereof "arrangement".

On page 34, line 15, insert ", with or without reimbursement" immediately after "resources".

On page 36, line 9, strike "this section" and insert in lieu thereof "section 12".

On page 39, line 9, strike "may" and insert in lieu thereof "shall".

● Mr. GORTON. Mr. President, I am offering an amendment to the committee amendment to the bill. This amendment does two things. First, it incorporates a suggestion by the distinguished Senator from Maryland, the chairman of the Judiciary Committee's Subcommittee on Patents, Copyrights the Trademarks, which clarifies that the Government will retain a right to use an invention resulting from cooperative research for its own purposes, royalty free, and in perpetuity.

Second, the amendment corrects an error in drafting in section 7, the employee activities section of the bill. This section was intended to codify an Executive order which requires that agencies turn over to the inventor rights to patents in which the Government has no interest. The committee amendment inadvertently provides that the agency may turn over these rights. The Executive order, which dates from the Truman administration, says the agency shall turn over these rights. Because the objective of the bill is to codify this policy and therefore strengthen it, it is important that the bill track the Executive order correctly. This is what the amendment accomplishes.

Let me also note one error in the committee report which may be misleading. Section 5 of the bill defines cooperative research and development arrangments as not including a procurement contract or cooperative agreement as those terms are used in sections 6303, 6304, and 6305 of title 31, United States Code. The report, in its discussion of this section on page 11, inadvertently left out the word "not."

Mr. President, these amendments are largely technical and are not controversial. I urge their adoption.●

The PRESIDING OFFICER. The question is on agreeing to the amendment.

The amendment (No. 2683) was agreed to.

AMENDMENT NO. 2684

(Purpose: To provide that in certain research and development arrangements, a Federal laboratory may consider reciprocity of treatment by foreign governments relating to such arrangements and licensing agreements)

Mr. SIMPSON. Mr. President, I send an amendment to the desk on behalf of Senator DOLE and Senator ROCKEFELLER to the committee substitute.

The PRESIDING OFFICER. The amendment will be stated.

The assistant legislative clerk read as follows:

The Senator from Wyoming [Mr. SIMPSON], for Mr. DOLE and Mr. ROCKEFELLER proposes an amendment numbered 2684.

Mr. SIMPSON. Mr. President, I ask unanimous consent that the reading of the amendment be dispensed with.

The PRESIDING OFFICER. Without objection, it is so ordered.

The amendment is as follows:

On page 34, line 2, strike out "and".

On page 34, insert between lines 2 and 3 the following:

"(D) in the case of any industrial organization or other person subject to the control of a foreign company or government, take into consideration whether or not such foreign government permits United States agencies, organizations or other persons to enter into cooperative research and development arrangements and licensing agreements.

On page 34, line 3, strike out "(D)" and insert in lieu thereof "(E)".

Mr. DOLE. Mr. President, this amendment which I am submitting today would clarify the authority of Federal Laboratory Directors with regard to granting foreign access to research information. It is my understanding that this language has been cleared by the necessary parties, and that it will be accepted. I believe this amendment also has the support of the administration.

U.S. industries are suffering from a serious trade imbalance, and it is important that we protect our interests where there is a lack of reciprosity. Foreign countries like Japan have become our very strong competitors in the world market, and perhaps we should not be quite so free with sharing our own research, especially in the high tech field.

Our universities and Federal laboratories have traditionally been very open, and there has always been easy access to the results of our basic research. The language which the Senator from Kansas is adding to this bill would give Federal Laboratory Directors the discretionary authority to deny foreign industrial organizations and persons subject to the control of a foreign company or Government access to U.S. research, when the foreign country in question does not grant similar privileges to American persons and industrial organizations.

It is only fair that Federal laboratory directors have control over the fruits of their endeavors, without the concern that foreign entities will take advantage of the foundation our laboratories have established. This type of information has been all too freely available, and foreign competitors have saved themselves a lot of time, energy, and expense by taking the results of our research and capitalizing on the free information they have obtained—to our disadvantage. It is time that we ask for reciprocal treatment.

I ask unanimous consent that a Washington Post article dealing with this problem be printed in the RECORD.

There being no objection, the article was ordered to be printed in the RECORD, as follows:

WHY SUBSIDIZE IMPORTERS? FOREIGNERS USE OUR UNIVERSITIES TO BURY OUR INDUSTRY

(By Michael Schrage)

Even as the trade deficit soars to a record $150 billion, the U.S. is funding a multibillion-dollar program that effectively sells the best of America's computer and engineering research to its Japanese and European competitors for less than 50 cents on the dollar.

Not a bad deal—if you're a Hitachi, Daewoo or a Siemens AG looking for a technical edge in today's competitive global marketplace.

What kind of policy is it that subsidizes America's corporate rivals with millions of dollars worth of our vital research?

It's the foreign policy practiced by America's leading research universities.

According to National Science Foundation statistics, nearly half the engineering and computer science graduate students in this country are from overseas; nearly half of them will return to the countries and companies that sponsored them. There they will apply their newly acquired knowledge to kick the stuffing out of U.S. companies.

These best and brightest minds will have studied in America the latest in semiconductor technology; the best ways to create new design software; the intricacies of developing novel composite materials for automobiles and airplanes. Expressly selected by their governments or companies to learn at America's finest universities, many of these students will become the captains of overseas industries.

Now, it's terrific that U.S. universities define the state of the art in so many engineering disciplines and that this country encourages the international exchange of research and a free flow of information.

But let's not confuse a free flow of information with an unwitting policy of subsidizing the research and development efforts of Japan, Korea and Europe.

Take, for example, the University of Michigan at Ann Arbor, one of the finest engineering schools in the country.

According to the University's 1985 figures, there are 1,452 graduate students enrolled in Michigan's College of Engineering; 751—more than half—are foreign students.

"Out-of-state" students (which is what foreign students are considered) pay tuition of approximately $7,916 per year—"less than half" of the yearly cost of training a graduate engineering student, according to a Michigan spokesman.

Who makes up that eight-grand per-student annual shortfall? Why, U.S. and Michigan taxpayers do. Ironically, so do American corporations like General Motors and Ford—which help fund Michigan's research in science and engineering. They help pay to train the very engineers who will end up competing with them back in Japan, Korea and Germany.

What entitles Japan or Korea to an American subsidy for higher education? More explictly, why should a Michigan or an Illinois charge the government-sponsored grad student from Tokyo the same as the kid from Toledo? Should out-of-state and out-of-nation be treated the same way?

If, as many in the university community believe, the answer is yes—then let's have a reational that goes a bit beyond "promoting the free flow of information."

The university structure was built with American tax dollars. The U.S. has chosen—rightly—to make its universities a resource for the world. But the world has changed dramatically in the last decade. The lines between pure and applied research have blurred; universities, now more than ever, are seen as a source of commercial innovation.

What is the compelling reason for American taxpayers to subsidize Cadillac-quality education for foreign students at Toyota-like prices? Especially since many of those students will end up competing directly with American companies?

"History shows that the Japanese students get more 'rubber on the road' [practical applications of what they've learned] when they get back home," said James Williams, dean of Carnegie-Mellon's College of Engineering.

The issue here is not banning foreign students or placing import quotas on them—it's eliminating a free ride for this country's economic competition. It's making countries and companies that can afford to pay for the value of a graduate education pay the full and fair price.

Tuition and fees aside, there are numerous ways and foreign countries and companies could show their support for the U.S. research institutions they patronize. They could give donations or help fund research programs.

What of the Japanese, Korean and European donations to Michigan, for example?

"Virtually none," said M. Joseph Roverson, director of corporate relations for the University.

In fact, a "not intended for release" National Science Foundation inquiry of over 100 leading research universities reveals that total foreign contributions to universities accounted for less than 2 percent of their research budgets.

"It's very unlikely that the amount exeeded 1 percent," said an NSE researcher, who asked not to be named.

Even if one excludes funds for national-security related research, the percentage of foreign contributions is still disproportionately low compared to the numbers of foreign graduate students now in the U.S. There's the distinct aroma of foreign free-loading on the campus.

Now, there are institutions that benefit from foreign largesse. The Massachusetts Institute of Technology has 12 professorial chairs endowed by Japanese companies and has enjoyed millions of dollars in research support over the years.

"We get most of our graduate students sponsored by industries in Japan," said Eugene Chamberlain, an MIT associate dean and international students adviser.

However, even a MIT total foreign funding of research represents barely 2 percent of the total. Roughly 29 percent of MIT's grad students are from overseas.

But the MITs are the exceptions, not the rule. The fact remains that American universities are seemingly neutral in the global economic competition—as ready to subsidize a Korean or Taiwanese company as one in the U.S.

(One notable exception is Pittsburgh's top-flight Carnegie-Mellon, which declines to accept Japanese funds and "restricts" the number of Japanese grad students precisely because it is concerned about technology transfer.)

Believers in the subsidy argue that many of these foreign students remain in the U.S. and that American companies can reap the benefit of their training. This is certainly true.

However, how do U.S. industry benefits balance with the potential problems? Does the U.S. keep the best of these post-graduate engineers or do the best ones go back to the Thomson CSFs, Matsushitas and Hyundais?

Academics assert that foreign students have become an indispensable part of the university research establishment; teaching undergraduates and assisting in research.

That may also be true. On the other hand, does charging a full price for an education mean that the number of foreign students will drop dramatically? Or will it more likely spark a sheepish recognition that overseas companies have been cream-skimming off the investments made by American taxpayers?

Foreign countries and companies should be required to pay a fair price for the educational benefits they receive from American universities. Moreover, countries which send thousands of grad students and "research associates" to the U.S. should be compelled to fund non-proprietary research projects in the U.S.

These suggestions should not imply a form of intellectual or academic protectionism; there should continue to be an international exchange of information. But U.S. policy makers and universities should recognize that while it is wise to encourage an international research effort for the betterment of all; it is foolish and counterproductive to let potential partners in that endeavor behave as parasites.

● Mr. GORTON, Mr. President, as I noted in my floor statement, I commend Senator DOLE for his leadership in the area of technology transfer and for his concern about research and development in this country. Senator ROCKEFELLER, as well, has been an active member of the Science, Technology, and Space Subcommittee with whom it has been a pleasure to work.

This issue of access to our universities and laboratories by foreign nationals, without reciprocal access to foreign research establishments, is extremely important. Senators DOLE and ROCKEFELLER'S amendment is an improvement to the bill which clarifies the laboratory director's discretion to reject a potential collaborator for this reason. I am pleased to accept the amendment.●

● Mr. ROCKEFELLER. Mr. President, I am pleased to join the distinguished majority leader in offering this amendment to H.R. 3773, the Stevenson-Wydler legislation. Our purpose is to improve the access of Americans to technology developed with the help of foreign governments. Apart from the military, our Government places few restrictions on the ability of foreign companies and individuals to acquire technology developed in our Federal laboratories. But unless other countries are more willing to provide equivalent treatment for our companies and researchers, the flow of technical information will remain largely one-way.

Under section 11 of this bill, Federal laboratory directors are empowered to approve cooperative R&D arrangements and licensing agreements with private industry. Where applications to enter into these agreements come from foreign parties, our amendment would permit the laboratory directors to take into account whether or not the countries involved permit U.S. agencies, companies, or other parties to participate in similar arrangements. The provision would apply to U.S. subsidiaries of foreign companies, as well as to other persons and organizations subject to the control of a foreign government. The amendment is fully consistent with the language of both Public Law 96-517 and the House version of the pending bill, which stipulates a preference for U.S. industry in the granting of licenses to inventions generated by Government laboratories.

At present, many U.S. corporations and researchers believe they are denied reciprocal access to foreign government-supported laboratories, particulary in Japan. Meanwhile, U.S. research laboratories—such as those connected with the National Institutes of Health, NASA, the Department of Energy, and many others—provide almost unlimited access to their work to interested parties in foreign countries. Without an amendment of this nature, H.R. 3773 could exacerbate the current imbalance in the international flow of information about technology, as we step up efforts to promote the transfer of technology from U.S. Government-operated laboratories to private industry.

If foreign companies seek to participate in cooperative research arrangements or apply for patent licenses, they would be permitted under H.R. 3773 to have access to literally billions of dollars of U.S. research results. This would occur regardless of whether their governments permit American companies to join similar Government-sponsored research projects or receive licenses to Government-held patents. Under our amendment, Federal laboratory directors could consider whether to require a quid pro quo before granting access for foreign applicants.

Let me emphasize, Mr. President, that we are not proposing to cut off foreign participation in Federal laboratories if the foreign governments refuse to offer reciprocal access. The provision is entirely discretionary on the part of the Federal laboratory directors; simply, they may take reciprocity into consideration when deciding whether to admit a foreign applicant to a cooperative research program or to allow the negotiation of a licensing agreement with a foreign party.

Americans are right to be concerned when they perceive that foreign scientists, engineers, and other researchers enjoy virtually unrestricted access to federally supported research while foreign governments systematically deny equivalent opportunities to our researchers. Because of this lack of reciprocal access to Government-developed technology, the flow of technology between the United States and other countries is largely outward: Our research results, licenses to patents, and other scientific know-how are put to good use by foreigners, while we often find ourselves shut out. Indeed, some of our leading edge technologies are routinely absorbed by foreign researchers and used to develop new products which compete successfully in our markets.

For example, according to a report by the Japan Economic Institute, the U.S. transferred to Japan six times as much electronics technology and almost eight times as much machine tool technology as it acquired from Japan in 1983. Altogether, 70 percent of Japan's worldwide technology imports that year came from the United States. While the Japanese bought technology from this country worth 191 billion yen, their exports of technology to us totaled 52 billion yen.

This asymmetry in the international flow of knowledge has real repercussions for our country's competitiveness in world markets. America's comparative advantage has always been superior technology—the fruits of our ability to innovate and invent. If our cutting edge technology is made fully available to our rivals in international trade, however, we stand to lose not only foreign markets but also jobs and income at home. We must recognize that the United States is no longer self-sufficient in technology: unless we insist on reciprocal access to technology developed elsewhere, major advances could pass us by.

I am encouraged that the Japanese Government intends soon to consider legislation to revise laws that presently prohibit acquisition of Government-owned patents by foreigners. Since Government laboratories develop some of Japan's most innovative technologies, access to such patents is extremely important to American companies. It's our hope that this legislation passes and is implemented in a way that improves U.S. access to Japanese technology and makes it possible for our researchers to work on cooperative research projects there.

H.R. 3773 will open up research conducted in Federal laboratories to private industry, domestic and foreign. It correctly seeks to encourage cooperative R&D projects and licensing agreements to help turn promising technologies developed under Government auspices into commercially viable products. This amendment, in my view, will strengthen the process of technology transfer which the Stevenson-Wydler Act hopes to facilitate. And by doing this, it will strengthen the international competitiveness of our industries. I urge my colleagues to consider and adopt it.●

The PRESIDING OFFICER. The question is on agreeing to the amendment.

The amendment (No. 2684) was agreed to.

AMENDMENT NO. 2685

(Purpose: To make amendments regarding technology transfer)

Mr. SIMPSON. Mr. President, I send an amendment to the desk on behalf of Senator DOMENICI to the committee substitute.

The PRESIDING OFFICER. The amendment will be stated.

The assistant legislative clerk read as follows:

The Senator from Wyoming [Mr. SIMPSON] for Mr. DOMENICI proposes an amendment numbered 2685.

Mr. SIMPSON. Mr. President, I ask unanimous consent that the reading of the amendment be dispensed with.

The PRESIDING OFFICER. Without objection, it is so ordered.

The amendment is as follows:

On page 29, line 16, strike "(2)" and insert in lieu thereof "(3)"; on page 29, line 24, strike "(3)" and insert in lieu thereof "(4)"; on page 30, line 1, strike "(4)" and insert in lieu thereof "(5)"; on page 30, line 6, strike "(5)" and insert in lieu thereof "(6)"; on page 30, line 16, strike "(6)" and insert in lieu thereof "(7)"; and on page 29, insert the following immediately after line 15:

"(2)(A) The Consortium shall not engage in the direct transfer of technology, but shall furnish information and respond to requests for technical assistance only in the manner specified in paragraph (1)(C).

"(B) Each Federal laboratory or agency shall transfer technology directly to users or representatives of users, and shall not transfer technology directly to the Consortium. Each Federal laboratory shall conduct any transfer of technology only in accordance with the practices and policies of the Federal agency which owns, leases, or otherwise uses such Federal laboratory.".

On page 30, line 17, strike "0.005" and insert in lieu thereof "0.0025".

On page 31, line 11, strike "appropriate.'." and insert in lieu thereof the following: "appropriate.

"(8)(A) The Consortium shall use 10 percent of the funds provided in paragraph (7) to establish demonstration projects in technology transfer. To carry out such projects, the Consortium may make grants or awards to, or enter into agreements with, nonprofit State, local or private organizations or entities whose primary purposes are to facilitate cooperative research between the Federal laboratories and organizations not associated with the Federal laboratories, to transfer technology from the Federal laboratories, and to advance State and local economic activity.

"(B) The demonstration projects established under subparagraph (A) shall serve as model programs. Such projects shall be designed to develop programs and mechanisms for technology transfer from the Federal laboratories which may be utilized by the States and which will enhance Federal, State and local programs for the transfer of technology.

"(C) Application for such grants, awards or agreements shall be in such form and contain such information as the Consortium shall specify.

"(D) Any person who receives or utilizes any proceeds of a grant or award made, or agreement entered into, under this paragraph shall keep such records as the Consortium shall determine are necessary and appropriate to facilitate effective audit and evaluation, including records which fully disclose the amount and disposition of such proceeds and the total cost of the project in connection with which such proceeds were used.".

● Mr. DOMENICI. Mr. President, the amendment I am offering, which I understand is acceptable to the sponsors of the bill, would accomplish three things. First, it clarifies an ambiguity in the bill about the proper role of the Federal Laboratory Consortium. It provides that the Consortium shall not transfer technology directly, but that those interested in a technology shall continue to deal with the laboratory or the agency, depending on agency policy, as they do now, to obtain rights to that technology.

● Mr. GORTON. The Senator from New Mexico is correct that the Federal Laboratory consortium is not intended to transfer technology directly. The Consortium's function is that of a clearinghouse for information about technology in the Federal laboratories. His amendment is a good addition to the bill which clarifies this point.

● Mr. DOMENICI. The second provision in my amendment reduces the set-aside of funds for the Consortium by half. Instead of setting aside approximately $1 million per year for 5 years for the Consortium, my amendment would set aside approximately $500,000. The reason for this provision is twofold. First, this set-aside comes out of agencies' research and development budgets. Although small, any reduction in these budgets at this time should be approached cautiously. Second, the Federal Laboratory Consortium has been functioning for some time on a budget of approximately $500,000 per year in cash and in kind services. My amendment gives them a secure source of funds, but keeps them at essentially a freeze level.

● Mr. GORTON. Mr. President, I am willing to accept this amendment. I believe the Federal Laboratory Consortium will prove to be of great benefit, not only to the Federal laboratories, but to the States as well. I appreciate the Senator from New Mexico's concern about its potential effect on agency research budgets, however, and his desire to go slowly in this area.

● Mr. DOMENICI. Mr. President, the third provision in my amendment takes the bill's efforts to improve technology transfer one logical step further—to the recipients. All of our efforts to improve the use of technology in the Federal laboratories is wasted if there are no working organizations or mechanisms outside the labs to locate and acquire this technology. My amendment directs the Consortium to transfer 10 percent of its funds to fund existing projects in technology transfer. The Consortium is to fund these demonstration projects through contracts, grants, or agreements with nonprofit State, local, or private entities whose primary purposes are to facilitate cooperative research between the Federal laboratories and outside organizations; to transfer technology from the Federal laboratories; and to advance State and local economic activity.

Mr. President, most of our States have active programs to promote economic development; many have programs to promote high technology industries. The States are experimenting with a wide variety of diverse programs, and this experimentation should be encouraged by the Federal Government. That is why my amendment funds demonstration projects, which should serve as models programs for other States.

In my State of New Mexico, there are several organizations which promote development in high technology. One, however, is especially devoted to technology transfer. The Rio Grande Technology Foundation is a nonprofit, privately funded organization whose purpose is to establish cooperative research centers at New Mexico's universities and Federal laboratories. It is distinct in its focus on the Federal laboratories, in its goal of linking the technological resources of the Federal, State, and private sectors, and in its reliance on private funding. This is the kind of organization which I believe could serve as a model program, and which should receive funding from the Consortium.

● Mr. GORTON. Mr. President, I could not agree more with my friend from New Mexico about the importance of recognizing the wealth of technological development programs going on at the State and local level. His amendment is an appropriate way to encourage this experimentation and I am pleased to accept it. I also agree with him about the unique nature of the Rio Grande Technology Foundation. I anticipate that the Consortium will create one or two demonstration projects, and that Rio Tech will be one of them.●

The PRESIDING OFFICER. The question is on agreeing to the amendment.

The amendment (No. 2685) was agreed to.

AMENDMENT NO. 2686

(Purpose: To make various amendments)

Mr. BYRD. Mr. President, I send to the desk an amendment by Mr. PELL.

The PRESIDING OFFICER. The amendment will be stated.

The assistant legislative clerk read as follows:

The Senator from West Virginia [Mr. BYRD], for Mr. PELL, proposes an amendment numbered 2686.

Mr. BYRD. Mr. President, I ask unanimous consent that the reading of the amendment be dispensed with.

The PRESIDING OFFICER. Without objection, it is so ordered.

The amendment is as follows:

At the end of the bill, add the following:

(e) The second sentence of section 2(10) of such Act (15 U.S.C. 3701(10)) is amended by inserting ", which include inventions, computer software, and training technologies," immediately after "developments".

(f) Section 3(3) of such Act (15 U.S.C. 3702(3)) is amended by inserting ", including inventions, software, and training technologies," immediately after "technology".

On page 43, line 5, strike "invention.'." and insert in lieu thereof the following: "invention.

"(11) 'Training technology' means computer software and related materials which are developed by a Federal agency to train employees of such agency, and includes software for computer-based instructional systems and for interactive video disc systems.'.".

On page 26, insert the following immediately after line 12:

(2) in paragraph (2), by inserting ", including software and training technologies," immediately after "technologies";

On page 26, line 13, strike "(2)" and insert in lieu thereof "(3)"; on line 14, strike "(3)" and insert in lieu thereof "(4)"; on line 16, strike "(4)" and insert in lieu thereof "(5)"; on page 27, line 1, strike "(5)" and insert in lieu thereof "(6)"; and on line 3, strike "(6)" and insert in lieu thereof "(7)".

On page 32, line 12, strike "reports.'." and insert in lieu thereof the following: "reports.

(3) Not later than one year after the date of enactment of the Federal Technology Transfer Act of 1986, the Secretary shall submit to the President and the Congress a report regarding—

"(A) any copyright provisions or legal or other barriers which restrict or limit the transfer of federally funded computer software to the private sector and to State and local governments, and agencies of such State and local governments; and

"(B) the feasibility and cost of compiling and maintaining a current and comprehensive inventory of all federally funded training software.'.".

AMENDMENT EXPANDING COVERAGE OF H.R. 3773

● Mr. PELL. Mr. President, I am offering an amendment, which I understand has the approval of the managers of the bill, to expand the coverage of H.R. 3773 to include the transfer of training technology which has been developed by the Federal Government and which could be of great benefit to the private sector and to the educational community.

Training technology is defined by the amendment to mean computer software for computer based instructional systems, such as interactive videodisc systems. Such systems combine visual representations of training problems with computerized instruction programs which offer a high degree of interactivity between the trainee and the system.

My amendment would add training technology to the innovations found suitable for transfer under the bill, and would make training technology subject to the clearinghouse function of the National Technical Information Service. The amendment also directs the Secretary of Commerce to report to the President and the Congress regarding legal barriers to such transfers, including patent and copyright issues, and also with regard to the feasibility and cost of compiling a current and comprehensive inventory of all federally funded training technology.

This is a no-cost amendment. But it fulfills to a substantial degree the purposes of S. 1662, the Training Technology Transfer Act which I introduced in 1985, and its predecessor, S. 2561, which I introduced in the 98th Congress. The amendment I offer today embodies the general intent of those bills, but omits their specific provisions for cataloging training technology and for promoting its transfer.

I should note that these bills orignated out of a desire to utilize all available techniques to train civilian workers who were dislocated as a result of changes in the pattern of international trade. While that remains a major goal of this amendment, I am pleased to note that the prospective beneficiaries cover a far broader spectrum than originally anticipated. As a result, the prospective return on the original public investment in this technology could be even greater than first suggested.

Finally, I wish to note that the amendment is the product of extensive bipartisan dialog between my office and the Department of Commerce, and particularly the office of the Assistant Secretary for Productivity, Technology and Innovation, Dr. D. Bruce Merrifield. The amendment, I believe, gives legislative expression to mutually acceptable goals while omitting features of S. 1662 which were controversial.

I thank the managers of the bill for their courtesy and consideration in accepting the amendment.●

● Mr. GORTON. Mr. President, the Senator from Rhode Island has identified a weakness in the Federal Government's Technology Transfer Program. Training technology, because of its great potential for education, should be an area in which we have an aggressive transfer program. I am happy to accept his amendment.●

The PRESIDING OFFICER. The question is on agreeing to the amendment.

The amendment (No. 2686) was agreed to.

AMENDMENT NO. 2687

(Purpose: To Make Various Amendments Regarding Technology Extension)

Mr. BYRD. Mr. President, I send an amendment to the desk on behalf of Mr. LEAHY.

The PRESIDING OFFICER. The amendment will be stated.

The assistant legislative clerk read as follows:

The Senator from West Virginia [Mr. BYRD], for Mr. LEAHY, proposes an amendment numbered 2687.

Mr. BYRD. Mr. President, I ask unanimous consent that the reading of the amendment be dispensed with.

The PRESIDING OFFICER. Without objection, it is so ordered.

The amendment is as follows:

On page 41, strike lines 12 through 14 insert in lieu thereof the following:

(5) Section 5(c) of such Act (15 U.S.C. 3704(c)) is amended—

(1) by striking "the Director" each place it appears and inserting in lieu thereof "the Assistant Secretary";

(2) by redesignating paragraphs (7) and (8) as paragraphs (9) and (10), respectively; and

"(3) by inserting immediately after paragraph (6) the following:

"(7) encourage and assist the creation of centers and other joint initiatives by State or local governments, regional organizations, private businesses, institutions, or Federal laboratories to encourage technology transfer, to stimulate innovation, and to promote an appropriate climate for investment in technology-related industries;

"(8) propose and encourage cooperative research among the Federal laboratories, State or local governments, regional organizations, colleges or universities, non-profit organizations, or private industry to promote the common use of resources, to improve training programs and curricula, to stimulate interest in high technology careers, and to encourage the effective dissemination of technology skills within the wider community;".

On page 29, line 11, strike "and"; on line 15, strike the period and insert in lieu thereof"; and"; and insert immediately after line 15 the following:

"(I) when requested, assist colleges or universities, businesses, non-profit organizations, State or local governments, or regional organizations to establish cooperative programs to stimulate research and to encourage technology transfer in such areas as technology program development, curriculum design, long-term research planning, personnal needs projections, and productivity assessments.".

● Mr. LEAHY. Mr. President, our Nation faces two important challenges for the future. We must compete with the Soviet Union to maintain a strong defense and to keep a secure peace, and at the same time we must compete with many other nations to ensure a healthy economic future. Meeting both challenges will depend on Americans continuing to be the world's best researchers, the world's brightest inventors, and the world's most skilled workers.

When I introduced the Technology Education and Extension Act last year, I addressed some of the benefits of the sharing of information between higher education and industry. The bill we are considering today is designed to improve the transfer of commercially useful technology from Federal laboratories.

Before describing my amendment, I want to thank the distinguished managers of the Federal labs bill for their cooperation in working with me and my staff to make the goals of the Technology Education and Extension Act part of the mission of the Office of Productivity, Technology and Innovation at the Department of Commerce and of the Federal Laboratory Consortium.

Our economic future depends on encouraging the efficient dissemination of skills and information within our communities. The Federal laboratories bill reported by the Commerce Committee took steps to encourage the Federal labs to participate with regional, State, and local governments to do that and to transfer technology. My amendment takes the committee proposal one step further.

It puts the Federal Laboratory Consortium in a position to help area colleges and universities, private businesses, State and local governments, and others to develop cooperative programs. I want to make clear that such joint programs may include any combination of the groups referred to in the amendment. Thus, one such program may combine the resources of a college and a Federal lab, while another would combine the efforts of

one or more local businesses and nonprofit groups, a State university, and a regional authority. These programs will stimulate research and encourage technology transfer in such areas as industrial program development, curriculum design, long-term research planning, personnel, and productivity.

The amendment makes the Department of Commerce an equal partner in this effort to encourage technology transfer and to promote an appropriate climate for investment in American technology-related industries.

I understand my amendment has been accepted by the distinguished floor managers.

In closing, Mr. President, I would like to thank Senator HOLLINGS and Patrick Windham of his staff for their invaluable help in our continuing effort to promote technology extension.●

● Mr. GORTON. Mr. President, my fellow members of the Committee on Commerce, Science, and Transportation and I share the Senator from Vermont's concern about the contribution our Federal resources could make to local economies. That is precisely the concern that led us to report this bill, and I am pleased to accept his amendment.●

The PRESIDING OFFICER. The question is on agreeing to the amendment.

The amendment (No. 2687) was agreed to.

AMENDMENT NO. 2688

(Purpose: To require agencies to make a separate determination of the mission of each of their laboratories)

Mr. BYRD. Mr. President, I send an amendment by Mr. BUMPERS to the committee substitute.

The PRESIDING OFFICER. The amendment will be stated.

The assistant legislative clerk read as follows:

The Senator from West Virginia [Mr. BYRD] for Mr. BUMPERS proposes an amendment numbered 2688.

Mr. BYRD. Mr. President, I ask unanimous consent that the reading of the amendment be dispensed with.

The PRESIDING OFFICER. Without objection, it is so ordered.

The amendment is as follows:

On page 34, line 20, strike the term "agency" and in lieu thereof insert "laboratory".

On page 35, between lines 3 and 4 insert the following: "(c) For the purposes of this section, an agency shall make a separate determination of the mission or missions of each of its laboratories."

On page 35, line 4, strike "(c)" and insert in lieu thereof "(d)".

● Mr. BUMPERS. Mr. President, I am pleased to offer this amendment to H.R. 4337, the Federal Technology Transfer Act of 1986. My amendment is a simple clarification of the bill to ensure that agencies give special consideration to certain Government laboratories. The amendment requires that agencies make a separate determination of the mission of each laboratory to determine whether the laboratory should participate in the cooperative research provisions of the bill. I am further pleased that the distinguished managers of the bill, Senators DANFORTH and HOLLINGS, have agreed to accept my amendment.

Let me first state that I am especially gratified to be a cosponsor of S. 1914, which this bill incorporates. This legislation, which amends the Stevenson-Wydler Technology Innovation Act of 1980, will most certainly be a boon to academic institutions and private industry in the United States through greater cooperation in and participation with the wide range of Government sponsored research. More importantly, the bill will be a springboard to economic development in many areas of our Nation.

This legislation will assuredly be a stimulant to innovators, whether they be employed by the Government or other institutions, to turn their ideas into commercial enterprises to provide jobs, income, and a better way of life for us all. As ranking minority member on the Senate Small Business Committee, I am particularly enthused about the unique opportunities this legislation will offer with respect to the creation of new, specialized small businesses.

The Federal Government is spending about $18 billion this year in research and development at some 700 Government laboratories. This effort employs a full one-sixth of our Nation's brightest and best scientific minds. In order to encourage the proper transfer of Government-sponsored research to the private sector, and to provide incentive for promising scientists and engineers to work in Government programs, the Federal Government should allow individual laboratory directors to engage in cooperative efforts to solve Government's problems and make the solutions available to the private sector.

This bill has been carefully crafted to allow for a cooperative approach to commercial uses of Government-sponsored research, while ensuring that the official mission of the laboratory is carried out with the best and most motivated minds. It will provide for extended cooperation between Government laboratories, state offices charged with technology transfer, universities, charitable organizations, and the private sector.

As a nation, we cannot afford to have the public and private sectors working in an environment alienated from one another. This bill will greatly facilitate a nationwide approach to research and development. We all recognize that the future economic health and development of our Nation rests firmly on our ability to more efficiently and cleanly manage our resources. We must make technological advancement. Unless we allow our Nation's institutions to pool their resources and talent, we will fall short of the demand for commercial innovation. This legislation represents a simple, important first step down that road.

The amendment I am offering clarifies the bill's language to ensure that all Government agencies take a look at each laboratory on a separate basis to determine whether the laboratory's mission is consistent with the provisions of the bill. My particular concern is with laboratories that are operated by regulatory agencies, but are not involved with the enforcement of regulations. The amendment is to make it clear that regulatory agencies consider each laboratory on an individual basis. Those that are not involved in the enforcement of regulations should be encouraged in the cooperative research agreements outlined in the bill.

Laboratories of this kind should not be excluded from the provisions of the bill, both now and in the future. I offer this amendment because of the great opportunities that will be provided by this legislation for the State of Arkansas and for the entire mid-South region. The National Center for Toxicological Research [NCTR], in Pine Bluff, AR, is such a laboratory that needs to benefit from the cooperative research and other provisions of this bill.

NCTR's parent agency is a regulatory agency—the Food and Drug Administration [FDA]—but NCTR is not involved in enforcement of that agency's regulations. It is important to note that NCTR is the only such Government laboratory separate and distinct from the enforcement functions of its parent. My amendment would require the FDA and the Department of Health and Human Services to consider NCTR's participation in cooperative research programs separate from the other FDA labs concerned with regulatory enforcement.

I fully expect NCTR to be included in the cooperative research agreements authorized by this legislation. I will be exercising vigorous oversight to ensure that FDA considers NCTR as a unique situation and will fully expect that NCTR will be encouraged by FDA to participate actively in the programs established. I have received assurances from the Commerce Committee that they, too, will exercise such oversight.

We in Arkansas are excited about the possibilities this legislation will provide with respect to NCTR. NCTR is the only Federal laboratory of its kind in the mid-South, and is the largest research lab in its field. It is by far the most unique and capable Federal research facility in the Nation. Started in 1972, the center serves not only the FDA, but also does research and development in connection with the Department of Defense, the Department of Energy, the Department of Commerce, and many other Federal entities.

NCTR is engaged in four primary areas of research. The largest area is

biomedical research, which encompasses subjects from preventing birth defects to the relationship between diet, nutrition, and human disease. The next largest area is the development of computer hardward and software technology related to toxic substances. The center also performs research and development in analytical chemistry and environmental engineering.

NCTR is in a special situation to promote economic development in Arkansas and throughout the mid-South. With all of the jobs that we in Arkansas have lost as a result of competition from abroad, we know that technological development can help us regain the competitive edge necessary to secure comparative advantages in world trade. With the space, equipment, talent and experience at NCTR, we want to encourage this vital research to be made available to the public for commercial purposes.

It is also important to note that the Arkansas Science and Technology Authority—the agency of the Arkansas State government charged with technology development and promotion—is just 3 years old. The Arkansas Science and Technology Authority and NCTR promise to be very effective partners in the application of research. I commend the leaders of these institutions for being in the forefront of the cooperative agreement approach of solving Government's problems and their enthusiasm for the application of this research for the private sector.

Once again, I am pleased to cosponsor this legislation and to offer this technical amendment. NCTR must be considered separate from the other enforcement laboratories under FDA, and, again, I expect that this consideration will lead to participation in the great opportunities of this legislation by NCTR. The Federal Government can do much to better the quality of life in our Nation if given the proper incentives, resources, and encouragement. This legislation provides the opportunity for the Federal Government to get in step with the State governments, academic institutions, and private enterprises toward a cooperative approach to the crucial questions we face together as a Nation. I urge the Senate to adopt my amendment and H.R. 4337.●

● Mr. GORTON. Mr. President, I thank the Senator from Arkansas, Mr. BUMPERS, for his amendment. The amendment helps clarify the bill to require agencies to take a look at the special considerations of each laboratory when they implement the cooperative research provisions. Clearly, the special case of the National Center for Toxicological Research in Pine Bluff, AR, indicates that it is a prime candidate for participation in cooperative research, and I believe it should be included in these agreements. We on the Science, Technology, and Space Subcommittee will exercise vigorous oversight on the inclusion of the National Center for Toxicological Research.●

The PRESIDING OFFICER. The question is on agreeing to the amendment.

The amendment (No. 2688) was agreed to.

The PRESIDING OFFICER. If there be no further amendment to be proposed, the question is on agreeing to the committee amendment in the nature of a substitute, as amended.

The committee amendment, as amended, was agreed to.

● Mr. DANFORTH. Mr. President, it is significant that the Senate is considering this legislation. To a great extent, the United States and its people enjoy our present stature because of our success in transforming science into technology. By allowing Government-operated laboratories to enter into cooperative agreements with industry, universities, and others, and by strengthening the organizations that transfer Federal technology, this bill will improve the abilities of these labs to transfer technology to the private and non-Federal public sectors. Technology transfer is an important process throughout the innovation cycle, and the Federal labs are the gatekeeper of large amounts of technology. This legislation should lead to the development of many new products and processes as new linkages are formed between the Federal labs and the rest of our economy.

I am pleased to support this bill. It was referred to the Senate Committee on Commerce, Science, and Transportation and considered with S. 1914. The committee ordered H.R. 3773 reported favorably, with an amendment in the nature of a substitute. The language of the amendment reported by the committee is that of S. 1914, with minor amendments. I am a cosponsor of S. 1914, which includes most of S. 65, which Senator DOLE and I introduced earlier in the 99th Congress.

Technological innovation is a complex process normally involving many resources and personnel. It invariably requires technology transfer. Technology transfer may occur as the scientist transfers information to the engineer converting the information into a working model; as a potential investor is informed of the state of the art in a specific technology; as a market analyst is informed of the potential uses of a technology; or as a producer provides know-how to the end user of the resulting product. If the United States is to maintain its premier position in this ever-growing technological world, it is absolutely necessary that we facilitate the technology transfer processes visualized by this legislation.

Linkages among scientists, between scientists and engineers, between inventors and entrepreneurs, between entrepreneurs and customers are essential. We must not only permit these linkages; we must encourage them.

This legislation helps accomplish this goal. It provides for royalty sharing with the inventor as an incentive for the inventor to be a champion in pushing potentially commercially significant technology from the Federal labs. This is important because the process of moving an innovation into the marketplace requires a champion. This bill also institutionalizes the Federal Laboratory Consortium to provide needed infrastructure to facilitate technology transfer and linkage development. It also clears away any legal impediments to cooperative research at the Federal laboratories.

Mr. President, I am pleased to join my fellow Senators from both parties in sponsoring this bill, and join them in urging the full Senate to pass it.●

Mr. GORTON. Mr. President, American businesses face an unprecedented challenge to their ability to compete, both at home and abroad, against foreign competition. On few issues is there as much of a consensus about the seriousness of the problem; and on few issues is there as little of a consensus on the solution.

Last year the President's Commission on Industrial Competitiveness identified a broad range of problems and made recommendations ranging from increasing support for basic research, to reducing the Federal deficit, to strengthening U.S. trade laws, to encouraging investments in worker training. The extent of this list indicates the difficulty of dealing with the entire issue of industrial competitiveness in any one piece of legislation. The problem is for too large for that, and demands steady action on a number of fronts.

The bill we are considering today, the Federal Technology Transfer Act of 1986, is aimed at one of those fronts: the use of the almost $20 billion in federally funded research and development done in the Federal laboratories each year. The Federal Technology Transfer Act of 1986 is designed to improve the transfer of technology out of the Federal laboratories and into the marketplace. It has three major provisions:

First. It opens up the Federal laboratories to industry, universities, and others for cooperative research;

Second. It creates the Federal Laboratory Consortium for Technology Transfer; and

Third. It improves the incentives for Federal scientists to put in the time and effort to explore the commercial possibilities of their inventions by requiring agencies to share at least 15 percent of the royalties received from patents with the inventor. In addition, it strengthens the existing cash award system to reward employees contributing to the missions of their agencies.

The bill also contains other amendments to the Stevenson-Wydler Technology Innovation Act of 1980 to bring it into conformity with existing practice.

The Federal Government will spend approximately $18 billion in fiscal

year 1986 on research and development at over 700 Federal laboratories. These laboratories employ one-sixth of the Nation's scientists and engineers. Although their main purpose is to serve Government needs, these laboratories also have produced over 28,000 patents. Many of these inventions may have commercial applications. Over the years, however, only approximately 5 percent of Federal patents have been licensed.

Senator DOLE has led the Senate in the enactment of several laws to improve the use of Government-funded research. One of the first was the Dole-Bayh Patent and Trademark Amendments of 1980—Public Law 96-517. The new patent policy led to increased efforts by universities to report, license, and develop inventions. In 1984, Congress extended the new policy to Federal laboratories operated by universities and nonprofit corporations—Public Law 98-620.

Also in 1980, Congress enacted the Stevenson-Wydler Technology Innovation Act of 1980—Public Law 96-480. The act makes the transfer of Federal technology to industry, States, and localities a national policy and the duty of each laboratory.

Despite these advances, there is broad agreement that we can and should improve the flow of technology from these laboratories to the private sector. The National Governors' Association, for example, issued a report in 1983 critical of the lack of cooperation or collaboration between the Federal laboratories and industry or universities.

In addition, in 1982, the White House Science Council created a Federal Laboratory Review Panel, chaired by David Packard. The panel surveyed both the Government-operated and contractor-operated Federal laboratories. In its 1983 report, the panel concluded that "Federal laboratories should encourage much more access to their facilities by universities and industry," and that "R&D interactions between Federal laboratories and industry should be greatly increased by more exchange of knowledge and personnel, collaborative projects, and industry funding of laboratory work." * * *

This bill implements that recommendation. It also uses the cooperative research being done at universities, including royalty-sharing, as a model for the Federal laboratories.

Mr. President, I urge my colleagues to support this legislation. It contains no authorizations and requires no new Federal spending. There will also be no indirect drain on Federal funds, because the Federal laboratories are allowed to contribute personnel, facilities, and equipment to a cooperative agreement, but not funds. And, unlike the House bill, the stream of royalty income flowing through the agencies to the laboratories in the Senate bill is subject to appropriations; therefore, no entitlements are created.

The Federal Laboratory Consortium is funded through a set-aside of money from each agency. This set-aside is small—0.005 percent of an agency's R&D budget, for a total of $900,000 in 1986; it is temporary—5 years; and it gives the Consortium the money it needs to fund one staffer in D.C. and to set up an electronic mail system. The Consortium is a respected, existing organization which already receives discretionary funds from many agencies.

The provision requiring an agency to share at least 15 percent of royalties with an inventor has proved to be the only controversial provision in the bill. It has been criticized as unfair, but the Senate bill addresses this criticism by incorporating the House bill's cash award system in addition to royalty sharing, specifically to reward productive employees and laboratories which do not work in commercial areas. It also allows the royalty income, after the inventor's 15 percent has come off the tops, to be used by the laboratories to reward other employees.

Royalty sharing has also been criticized as inflexible and bad management, but this has not proven to be true in the experience of universities, which have been required to share royalties with inventors since 1980. Their experience has led universities to increase the share going to inventors, because the incentives lead to more invention reporting and more technology transfer. The Federal labs are more like the universities in their inability to reward employees with raises and promotions easily than they are like private industry, which can, indeed, have a completely flexible management system.

Royalty sharing has also been criticized as setting a dangerous precedent for the private sector. The bill has no effect on the private sector, however. Any precedent set by revenue sharing was set already with the universities in the Dole-Bayh Act in 1980.

All-in-all, Mr. President, the arguments against royalty sharing are unconvincing. And they are far outweighed by the potential gain from giving Federal employees a stake in the outcome of their work.

I would like to express my gratitude to Senator DOLE, who has done more for technology transfer than any other single Member of Congress. I am also grateful to Senator MATHIAS and his staff for their expertise and suggestions. Senator DANFORTH, the distinguished chairman of the Commerce Committee, was the original cosponsor of S. 65, Senator DOLE's bill which is at the heart of the legislation we are considering today. Senators DANFORTH, HOLLINGS, RIEGLE, PRESSLER, GORE, ROCKEFELLER, and INOUYE cosponsored S. 1914, the substance of which we are considering today, and contributed to the unanimous, bipartisan support the bill enjoyed in the Commerce Committee.

Mr. President, I believe this is a sound piece of legislation. It takes extremely valuable national assets, the Federal laboratories, and makes them more accessible to our businesses, our universities, and our State and local governments. It involves no increased Federal spending or regulation. It will not solve the problem of lagging international competitiveness in one blow, but it is a solid step in the right direction, and I urge its enactment.

Mr. President, the latest issue of Business Week contains an especially timely article on technology transfer. I ask unanimous consent that the article appear following my statement.

There being no objection, the article was ordered to be printed in the RECORD, as follows:

[From Business Week, Aug. 11, 1986]

BUILDING BRIDGES BETWEEN PUBLIC AND PRIVATE R&D

For Richard A. Cortese, it's a dream coming true. The president of Alpha Microsystems has long—and longingly—admired the Jet Propulsion Laboratory. After all, that National Aeronautics & Space Administration lab in nearby Pasadena, Calif., is a technological powerhouse. But even though his little computer company is just 45 mi. away in Irvine, Cortese never figured he stood much change of tapping JPL's technology storehouse.

But thanks to Rimtech, a nonprofit company that aims to push JPL technology into the commercial arena, Alpha Microsystems and other Southern California companies are getting a crack at pulling JPL's space-age developments into their businesses. "The JPL expertise may give us a leg up on the competition," says Cortese, who wants to learn about JPL's techniques for compressing computer data. That could boost the capacity of Alpha's tape-based storage system for personal computers.

Rimtech—which is short for Research Institute for the Management of Technology—is a new twist in the way the country's national labs interact with industry. For an entry fee of $25,000, Rimtech helps find solutions to specific problems. It asks a company to list its technical hurdles, then checks with JPL researchers to see if they can help. The Company also markets JPL technology to likely prospects. "We see ourselves as a catalyst," explains Rimtech President Steven M. Panzer.

The new program at JPL is the latest step in an effort to better utilize the enormous scientific resources of the federally funded labs. In addition to such venerable institutions at Los Alamos, Lawrence Livermore, and Brookhaven, there are 700 more lesser-known lights. Collectively, they spend more than one-third of the government's annual research and development budget—$55 billion in fiscal 1986. Their work has produced some important commercial technologies; clean rooms for the semi-conductor industry and nuclear magnetic resonance imaging, to name just two.

That's why Congress told the national labs in 1980 to get more bang for the tax buck by identifying R&D with commercial potential and passing it on to industry. Most labs, however, still aren't adept at spinning off R&D. Technology transfer has often meant little more than publishing research results and hiring someone to stage seminars. "It's catch-as-catch-can," admits Ronald W. Hart, director of the National Center for Toxicological Research.

SALES INCENTIVES

NASA, for example, spends $11 million a year to peddle its technology to industry. But since it began charging for technology licenses only in 1981, it collects a paltry $100,000 a year in royalties. Even lab officials admit they haven't been very effective at transferring technology. Partly that's because their researchers have little incentive to think along commercial lines, since they don't share in patent royalties. Eugene E. Stark, chairman of an action group called the Federal Laboratory Consortium for Technology Transfer, concedes that "at best, we're only at 20% of the optimum level of transferring technology."

But Washington is about to crack the whip again. This month, Congress will probably send President Reagan new legislation aimed at fostering even tighter links between the labs and industry. The ticket to mobilizing the labs in defense of U.S. interests, Congress believes, is to make them more businesslike—and what better way to do that than to apply the profit motive? A key provision of the House bill, passed last December, will give each lab director the authority to sell licenses to his facility's work—and allow the lab to bank the royalties. An amendment in the Senate version would compel the labs to pay at least 15% of all royalties to the researchers who patented the technology.

Some labs are already implementing new mechanisms for technology transfer. In New Mexico, both Los Alamos National Laboratory and Sandia National Laboratories have emulated a recent university practice and set up "incubator" operations to nurture enterpreneurs. Tennessee's Oak Ridge National Laboratory even has its own for-profit venture capital group. "We've spun off seven companies in the last year," boasts E. Jon Soderstrom, director of technical applications. And if Rimtech is successful at JPL, NASA plans to roll out similar programs at all of its labs.

AN ACTIVE VENDOR

The National Bureau of Standards has long been effective at transferring its technology. That agency's secret: encouraging industry to assign researchers to temporary duty in NBS labs. As many as 900 industry-sponsored researchers have augmented the NBS staff of 1,400 professionals "Technology is in the minds of people," observes Alfred S. Joseph, chairman and founder of startup Vitesse Electronics Corp. in Camarillo, Calif. "You can either send your people to the labs, or you can bring the federal-lab people out."

Industry, however, is hardly without blame for the poor results of technology transfer. Many companies are ignorant of the new openness of federal labs. Others remain unaware that Washington had changed the rules governing licenses to permit exclusive deals. As a result, says Robert H. Pry, a technology consultant who advises Washington, "you have to do a lot of evangelism just to get them interested."

Foreign companies don't need prodding. Overseas businesspeople are flocking to the national labs. Some lab officials confide that the number of visitors from offshore, especially Japan, is frightening: They far outnumber the representatives from U.S. companies. So unless more executives like Cortese take advantage of such programs as Rimtech, promising new technologies may go begging in America, while foreigners become the first to reap the benefits of U.S. tax-supported research.—By Scott Ticer in Los Angeles.

Mr. DOLE. Mr. President, in fiscal year 1986 the Federal Government will spend approximately $18 billion on research and development at over 700 Federal Laboratories. Over the years these laboratories have produced well over 28,000 Federal patents, yet only 5 percent of these patents have been licensed to date. This legislation addresses this problem by amending the Stevenson-Wydler Technology Innovation Act of 1980 in an effort to promote technology transfer to the private sector by authorizing government-operated laboratories to enter into cooperative research agreements and by establishing a Federal laboratory consortium for technology.

DOLE LEGISLATION

As I am sure many of my colleagues are aware, I have long been a promoter of more private sector involvement with our Government's research facilities. Six years ago, I was pleased to join our former colleague, Birch Bayh, in working to eliminate much of the tangle of bureaucratic brambles that impeded the ability of universities and small businesses to transform federally assisted research into a patented invention. Specifically, with the enactment of Public Law 96-517, we established, for the first time, a rule in favor of university and small business ownership of inventions developed. Now, university and industry collaborative research is at an all-time high, and whole new technologies have flourished as a result.

Despite my efforts on the Bayh-Dole Act and the Stevenson-Wydler Act, I soon discovered that the Federal laboratories still faced problems and disincentives in trying to transfer technology. Last year, I returned to the field to propose the next logical step with the introduction of the Uniform Patent Procedures Act—a bill that extended the principles of the 1980 law to large business contractors and repealed all existing laws which were inconsistent with those principles. It established a clear and consistent presumption in favor of invention ownership for all contractors and eliminated once and for all the hodgepodge of agency patent requirements built up over the years. It had the further effect of luring research investments from large business with their specialized skills, technological expertise, and healthy respect for the dollar.

On the first day of the 99th Congress, I also introducd a second bill, S. 65, designed to enable Federal laboratories to enter into the kinds of successful joint university research and licensing arrangements that have resulted from Public Law 96-517. That bill expressly permitted agency heads to authorize lab directors to undertake a wide range of cooperative R&D arrangements. The labs would negotiate and issue patent licenses, assign ownership rights, and require outside parties to pay royalties for the right to use Government inventions. It provided for direct payment of at least 15 percent of royalties so received to lab investors and allowed labs to keep royalties they receive after payments to investors. This bill further permitted lab inventors to own their inventions if the Government had an insufficient interest in seeking its own patent.

COMMITTEE BILL

Mr. President, I am happy to report today, that the committee reported bill incorporates nearly all of the initiatives I identified in my two previous legislative efforts. As reported, this legislation will improve the technology transfer provisions of the Stevenson-Wydler Act by bringing them into conformity with actual practice and by eliminating some waivers. It will create a Federal laboratory consortium for technology transfer and permit laboratories to enter into cooperative research agreements and negotiate patent licensing agreements. It will also create a system of cash rewards for scientists, engineers, and others and will give 15 percent of the royalties received from an invention to the inventor with the balance distributed amongst the laboratories.

CONCLUSION

Mr. President, America's future demands the liberation of her brightest intellects and broadest imaginations. Over and over, throughout our history, our system of free enterprise, with its incentives and rewards for the new and innovative, has replaced what was adequate for one generation with what is superior for the next. Far better than Government, that system can explore new realms of possiblity. But it cannot compete with foreign challengers with one hand tied behind its back. This legislation will help untie a few knots. I urge my colleagues to join me in supporting it.

● Mr. HOLLINGS. Mr. President, I am pleased that the Senate is considering this important legislation. By allowing Government-operated laboratories to enter into cooperative agreements with industry, and by strengthening the organizations that transfer Federal expertise to the business community and the States, this bill will improve the contribution that Federal labs make to the Nation's industrial modernization, economic development, and overall competitiveness. And it will do this without spending any new Federal dollars.

The bill also enjoys strong bipartisan support, both in the Senate and in the House. In fact, H.R. 3773 passed the House unanimously late last year. Many Senators from both parties have been involved in writing our version. It incorporates many provisions first offered by Senators DOLE and DANFORTH in their bill, S. 65. Later a distinguished group of members, including many colleagues from the Commerce Committee, introduced S. 1914. In March, the Commerce Committee reported that bill without objection, changing the bill number to H.R. 3773. Other Senators have helped us write the noncontroversial amendments that we propose adding to the bill today. Finally, both our bill and the si-

miliar House bill have been written in consultation with executive agencies. The Commerce Department has played a particularly valuable role.

Mr. President, this bill makes a great deal of sense. The Federal Government's laboratories are a tremendous national resource, employing one-sixth of the Nation's scientists and engineers. Of course, their primary function is to perform research in support of essential Federal missions, from defense and energy to health, food, and natural resources. At the same time, however, hearings and research by the Commerce Committee's Science Subcommittee show that these labs also have unique facilities, expertise, and inventions which could help the private sector if they only had legal authority to cooperate with private industry, universities, and the States. For example, the Federal laboratories have patented over 25,000 inventions, many of which could lead to valuable commercial products if Government laboratories and industry were allowed to work together more closely. Moreover, Federal scientists and engineers could provide advice and technical assistance to State and local governments on a wide range of issues.

A few Federal laboratories have the necessary legal authority now, particularly several of the Energy Department facilities run by contractors. Already we are seeing beneficial results. For example, scientists at Los Alamos National Laboratory have invented a process that identifies viruses and bacteria in minutes, rather than the days and weeks now needed. A private company is not working with Los Alamos to develop the product commercially. In addition, the National Bureau of Standards and Oak Ridge National Laboratory are working with the steel industry to modernize steelmaking. The bill that we introduce today would extend this legal authority to over 300 Federal laboratories operated by the Government itself rather than by contractors.

The legislation would allow agencies with Government-operated laboratories to allow these labs to enter into cooperative agreements with corporations, universities, and State and local government—at the partner's expense—for the purpose of developing new technologies, products, and companies. The labs could waive patent rights to resulting inventions, if that seemed the best way to encourage commercialization of a product, or they could negotiate royalty requirements and reserve such rights as they deem appropriate.

In addition, the new bill also would strengthen the laboratory organizations that provide information and assistance to industry and to State and local officials. These organizations include the small Federal Laboratory Consortium, the one nationwide group that links laboratory technical information specialists to each other.

I want to put to rest one particular concern about cooperative agreements. Some people fear that allowing Government labs to work with private industry may lead the labs to neglect their fundamental Government responsibilities. Believe me, if I thought for a moment that this bill would compromise Federal programs, I would oppose it. But this bill provides the proper safeguards. No agency is required to work with industry—the bill simply permits agency heads, at their discretion, to allow some cooperation with industry. The agency head determines the level of cooperation, the kinds of projects, and what royalties to collect. At the same time, Federal labs would continue to perform their Government responsibilities.

Mr. President, this bill will not magically solve the Nation's economic problems or instantly rejuvenate all industries. It is not a panacea. Many other steps can and should be taken to help American industry regain its technological lead and international competitiveness. This legislation, however, is a concrete and valuable step toward better utilization of the tremendous technology and expertise present in our national laboratories. It will not cost the taxpayers a dime, and it may actually make some money for the Government.

This is an important, innovative bill. I was pleased to join my colleagues from both parties in sponsoring it, and I am pleased today to join them in urging the full Senate to pass it.●

● Mr. RIEGLE. Mr. President, today the Senate is considering an important bill to let our Federal laboratories contribute more fully to American industrial innovation and to State economic development. Recent economic developments clearly show the need for this vital amendment.

As I pointed out when we introduced the original version of this bill, over the last decade this country has become less competitive in world markets for high technology products. The American share of the world market for 8 out of the 10 leading high technology exports has fallen. As developing countries begin to mass produce high technology as well as low technology products, we must push even harder to maintain an advantage in the newest and technologically most advanced product markets. Unfortunately, we are failing to do so.

Federal scientists and engineers have not been as helpful to American industry as they might be—not because they have failed to come up with new ideas, but because Government restrictions have prevented many innovations from being commercially developed. Last year, the Federal Government spent nearly $18 billion on research and development in our national labs. Historically, less than 5 percent of the patents granted to personnel in Federal labs were developed into commercial products. We must do more to foster inventiveness and promote technology transfer.

Congress has acted to help America get more of its money's worth from Federal-funded technology. The original Stevenson-Wydler Act set technology transfer from labs to industry and the States as a national priority. The Bayh-Dole Act of 1980 set a valuable precedent for Federal technology in general by allowing nonprofits and small for-profit businesses to retain ownership of inventions and receive royalties, the incentive needed to persuade companies to invest the money needed to move Federal technology from the laboratory shelf to the commercial marketplace. In 1984, this right was extended to one type of Federal laboratory—labs operated by nonprofits under contracts with the Government. In recent years, the Department of Energy has used separate authority to allow some corporations that operate several other labs under contract to commercialize Federal inventions.

Most Federal laboratories, however, fall into another category; they are operated by Government employees. Inventions at these labs can currently be licensed to private sector firms, with the Government receiving the royalties. The problem, however, has been that these innovations often need a great deal of development before they can be commercialized. Many of these Government-owned, Government-operated facilities lack legal authority to enter into cooperative research arrangements with industry and the States in order to refine these inventions and make them commercially valuable.

The bill before us today would remedy this problem. It would further encourage technology transfer in several ways.

First, agencies could allow their lab directors to enter into cooperative research and development arrangements with industrial organizations and State governments. This provision is discretionary. It does not require labs to work with anyone, but it does allow them to cooperate with American industry to pursue opportunities created by their work. The agencies and labs themselves would decide when, and under what conditions, to work with industry and the States. National security controls on classified information would, of course, be maintained. The national labs would be enabled to receive funds and property from their partners in return for royalties. The labs could negotiate royalties and retain Federal rights to the inventions.

Second, this bill would improve currently existing technology transfer organizations. It would strengthen existing technology transfer offices at the laboratories—the Offices of Research and Technology Applications [ORTA's]. In addition, it would provide modest funding to support the already existing Federal Laboratory

Consortium, a volunteer organization helping to transfer technology from the labs to private businesses with a small set-aside from the National Bureau of Standards. This limited amount of funding would begin in fiscal year 1987 and end automatically in fiscal year 1991.

These provisions contain no new authorization and require no new Federal spending. In fact, the Government could receive a stream of new income from negotiating royalties when unused patents are brought to the market.

Mr. President, this is a valuable and important step toward better utilizing the taxpayer's investment in Federal technology. The bill enjoys broad bipartisan support, and I urge our colleagues to support it.

The PRESIDING OFFICER. The question is on the engrossment of the committee amendment and third reading of the bill.

The amendment was ordered to be engrossed and the bill to be read a third time.

The bill was read a third time.

The PRESIDING OFFICER. The bill having been read the third time, the question is, Shall it pass?

So the bill (H.R. 3773) was passed.

Mr. SIMPSON. Mr. President, I move to reconsider the vote by which the bill passed.

Mr. BYRD. Mr. President, I move to lay that motion on the table.

The motion to lay on the table was agreed to.