INDUSTRIAL INNOVATION

JOINT HEARING

BEFORE THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

AND THE

SELECT COMMITTEE ON SMALL BUSINESS UNITED STATES SENATE

COMMITTEE ON SCIENCE AND TECHNOLOGY

AND THE

COMMITTEE ON SMALL BUSINESS U.S. HOUSE OF REPRESENTATIVES

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INDUSTRIAL INNOVATION

TUESDAY, OCTOBER 31, 1979

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
SELECT COMMITTEE ON SMALL BUSINESS,
U.S. HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND TECHNOLOGY, AND
COMMITTEE ON SMALL BUSINESS,
Washington, D.C.

The committees met jointly at 10:35 a.m., in room 1202, Dirksen Senate Office Building.

Senator STEVENSON. The meeting will come to order.

This meeting is something of an innovation in the Congress. It is a quadrilateral meeting of the Senate Commerce Committee, the House Science Committee, and the Senate and House Small Business Committees.

The subject is the President's announcement on innovation. This committee's meeting takes place within an hour of that announcement this morning.

Before I make a brief statement, I would like to yield to my colleague, Senator Nelson, who must leave us for another committee meeting. Senator Nelson.

OPENING STATEMENT BY SENATOR NELSON

Senator NELSON. Mr. Chairman, I appreciate having the opportunity to submit my statement for the record. I apologize to the Secretary for being unable to be here. We are in the final markup of the disability amendments to the social security bill in the Finance Committee one floor above. I have two amendments that need to be added to that bill, so I need to go back there and if I can get my amendments taken care of, I'll be back here. So my apologies to you for not being here during your presentation.

This morning's hearing has been called to receive the results of the President's review of innovation policy.

The importance of the report and of this subject is indicated by the participation of four committees—the Senate Commerce and House Science Committees, which have jurisdiction in these matters; and the Senate and House Small Business Committees, which are vitally concerned.

The Nation faces unprecedented economic problems: inflation, energy, and declines in productivity and economic growth.

In my view, our best hope for resolving these problems is to speed up the process of innovation that has been the trademark of this country since its beginnings.

Innovation can mean alternative energy sources, more efficient machines, greater productivity, and new techniques for working smarter instead of longer. It is highly likely that such improvements will result in measurably lower costs, better products, new jobs, and expanded export sales. Innovation is also translated directly into more powerful defense and disarmament positions and a stronger economy and currency.

The Small Business Committee has long known that small and independent enterprise brings uniques capabilities into the innovation process.

A recent book by a Harvard researcher,[1] Thane Gustafson, compares United States and Soviet Union scientific output an sheds light on the nature of these small business advantages. According to this book Russia claims it has many more scientists and engineers than the United States and spends an equal amount of money on scientific research. Yet, the researcher concludes:

> On the whole it (Russia) does not get the same return . . . Whether success is measured by major innovations, Nobel prizes, or the quantity of publications, the United States is far ahead in most disciplines.

The reason given for this lag in scientific productivity is that Soviet research is "heavily centralized, bureaucratized, and noncompetitive * * *."

In this country, the most uncentralized, unbureaucratized, and competitive element of this country—small business—produces about half of all innovations, and does so at one-quarter the cost for medium-sized business and one twenty-fourth of the cost for large corporations.[2]

These two studies confirm that a climate of freedom and economic opportunity will maximize innovation.

By exercising personal freedom and seizing the opportunities provided by our private enterprise system, small businesses have created America's competitive edge throughout our history. They are a national resource that we cannot afford to waste.

Yet the Federal Government has not been taking full advantage of these extraordinary abilities. Small enterprises, which produce half of all U.S. innovation, receive less than 3½ percent of Federal research and development funds.

In my view, this underutilization of small enterprise is one of the major difficulties of the country's innovation effort. In basic science, the United States has a magnificent record: 103 Nobel prizes in the scientific fields of physics, chemistry, and medicine.[3] In comparison, Great Britain has won 55, Germany 22, the Soviet Union 6, and Japan 3.

Despite this predominant achievement in pure science, there is a serious imbalance in terms of economic returns. The United States has lagged far behind other countries in increasing gross national product, exports, and manufacturing productivity during the last decade.

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[1] "Why does the Soviet Union lag behind the United States in basic science?" By Thane Gustafson.

[2] See "Small Business and Innovation." Report by the Senate Small Business Committee, Dec. 28, 1978 (Senate Report 95-1413), page 2 *et seq.* Based upon a study by the U.S. National Science Foundation.

[3] Since 1901, when the awards began.

Between 1976 and 1978, German industry exceeded our productivity increases by more than 50 percent, and the improvement by Japanese industry was double the United States. These countries also surpassed U.S. growth in exports and gross national product, even though they import a larger proportion of oil than the United States.

The experts in the field believe that we are being outdone at the application of science. Basic scientific discoveries as represented by Nobel prizes become available to all nations. What counts in the statistics is how effective a nation is in transforming science into commercially marketable products. This is what innovation policy is all about, and this is precisely where the United States is falling short.

In my view, we need a strong innovation policy with more balance between science and technology in the Nation's research policies.

I plan to introduce a further proposal in the near future to provide a high-level coordinating mechanism which will give greater attention and emphasis to innovation, technology, and small business in the White House.

[The table follows:]

GROWTH RATES FOR SELECTED ECONOMIC INDICATORS

[Percent]

	Gross national product	Volume of exports	Productivity in manufacturing
Japan	+116.7	+256.8	+115.7
West Germany	+50.0	+110.1	+75.3
United States	+38.8	+98.1	+46.1
United Kingdom	+27.7	+106.3	+28.6

Source: Economics Division, Congressional Research Service, Oct. 25, 1979. Also, these countries import relatively more oil than the United States.

Senator NELSON. Throughout the Government this measure will propose that one of the four Associate Directors, which the present law provides for the Presidential Office of Science and Technology Policy, possess business and innovation experience. It further provides that the President's Science Adviser consult with representatives of business—including small business—labor, public interest groups, and academicians so that both the executive and legislative branches of the Government can be properly advised on how innovation policy should be strengthened.

That should be the starting point. To be successful, innovation policy must push forward to help new and small innovative firms in many areas—a higher level of participation in Federal research funds, more sensitive procurement and contracting techniques, improving capital formation at the early stages of their development, a more equitable patent system to help protect their discoveries, more assistance from university experts, breaking of regulatory barriers and reduction of paperwork that constitutes a drag on the creative energies of this most dynamic segment of the economy.

We recently introduced one bill to provide for many aspects of such a small business policy.[1]

[1] S. 1860, the "Small Business Innovation Act of 1979" introduced on October 4, 1979.

It has been a long, hard fight to secure recognition of the significance of innovation and the small business role in innovation.

This administration began over 1 year ago to address these challenges.

The President's policy review involved 30 agencies, which indicates the complexity of this matter.

The Presidential review has focused the executive branch, the Congress, the press, and private industry on the significance of greater innovation.

These advances are gratifying. But we have a great distance to travel before small innovative enterprise can make its full contribution to the national interest.

This hearing marks the beginning of the second phase of the process—the hammering out of policies and practical machinery by which the Nation can encourage and harness greater innovation to meet our needs.

I would like to commend the spirit of cooperation of the chairman of each of the committees that have worked together to bring about today's hearing. In my view, these combined efforts greatly increased the possibilities that we can achieve wise and effective innovation policies.

Thank you very much, Mr. Chairman.

Senator STEVENSON. Thank you, sir.

OPENING STATEMENT BY SENATOR STEVENSON

Senator STEVENSON. Industrial technology has been a sometime interest of the Commerce Department since the days of Herbert Hoover. Today we meet to hear the recommendations of the latest in a long series of reports, this one more timely than its predecessors.

Last year the trade deficit reached about $30 billion, last month about $2.8 billion. The dollar has sunk like a barometer of world confidence in our ability to compete in the new economic environment.

The international monetary system, hinged to the dollar, has vanished. Productivity gains ground to a virtual halt. The Nation, by no coincidence, continued to suffer from inflation and unemployment.

If this exercise in innovation accomplishes more than its predecessors, it will be a tribute to the leadership of Secretary Kreps and the perseverance of Jordan Baruch and Frank Press, as well as the personal interest of President Carter.

It will also be the result of cooperation among committees and Members of Congress. I welcome the participation of the Science and Technology Committee and the Senate and House Small Business Committees in this hearing, which continues the review of technology policy that the Senate Commerce Committee began in January 1978.

With cheap labor, cheap fuels, cheap money and cheap raw materials all gone and competition growing for the world's markets and supplies, the most promising sources of growth, real wealth, and enhanced productivity for the United States are through technological advances and industrial innovation.

An innovation program circumscribed in vision and nurtured in a climate of fiscal retrenchment is unlikely to produce a bold basis for national industrial policy. Such a policy, it seems to me, demands an ungentle review of tax codes and monetary instruments, export promotion and adjustment assistance, patent laws and antitrust rulings.

It requires resistance to the pressures for protection of low-growth industries from competition and natural adjustments. It requires an assessment of traditional attitudes about the relationship between Government and industry and assistance for high-growth industries.

We look forward to receiving and acting upon the proposals of the administration.

Congressman Bedell?

OPENING STATEMENT BY REPRESENTATIVE BEDELL

Mr. BEDELL. Thank you, Mr. Chairman.

I am pleased to be here this morning, representing the House Small Business Committee, along with my colleague, John LaFalce.

The issue of small business in new high-technology areas is one which we consider to be of great importance. In the last session of Congress, the House Small Business Subcommittee on Antitrust, which I now chair, held joint hearings with the Senate Select Small Business Committee.

The subject was small business innovation. The Antitrust Subcommittee issued a report in January of this year, entitled "Underutilization of Small Business in the Nation's Efforts To Encourage Industrial Innovation."

We view the joint hearings today and tomorrow as an excellent opportunity to follow up on last year's study and to explore what actions the administration has taken and proposes to take.

In the weeks and months ahead, I am sure that the various committees and subcommittees involved here today will take substantial action to pursue the points discussed here.

The participation of four full committees in these unusual joint hearings helps to underscore how important this subject is.

I would like to yield, if I may, Mr. Chairman, to John LaFalce, who also serves on the Small Business Committee.

OPENING STATEMENT BY REPRESENTATIVE LA FALCE

Mr. LAFALCE. Thank you, Mr. Bedell.

As chairman of the Small Business Oversight Subcommittee in the House, I have been very concerned about the entire concept of innovation and productivity, and for the past 3 years have been having hearings on these issues on a regular basis, the last of which was about a week and a half ago, with Dr. Baruch.

I want to commend the four committee chairmen for having a joint hearing on this most important issue. I think that joint hearings of this nature provide a very efficient forum for consideration of the issue in general, and certainly the domestic policy review just released on industrial innovation.

I am pleased that President Carter has seen fit to review this most important concern, and to make concrete proposals to stimulate innovation. My pleasure is overshadowed by my dismay of

what was not recommended by the administration, but what I find especially troublesome is the glaring omission of any tax incentives whatsoever.

Any proposal which is designed to stimulate the innovative processes in America must of necessity address our tax system. All the proposals that are made in this innovation package will take a considerable length of time to work themselves into the system.

This is not to say that they will not ultimately benefit the innovative process. It is to say that it will take considerable length of time for the Federal Government and the private sector to respond over changes to our tax laws about the possibility of a much quicker reaction to such a stimulus.

The various task forces which have focused on the innovation process have all noted the need for tax stimuli.

In fact, I understand that the options paper submitted to the President contains provisions for tax stimuli.

Nevertheless, the package that has come from the administration contains none.

As far as such tax changes are concerned, there have been a number of bills introduced in both bodies that would accomplish this. On the House side, the chairman of the Small Business Committee, Mr. Smith, has introduced a comprehensive package that includes a title with amendments to the Internal Revenue Code.

I have also introduced a bill with very similar amendments. On the Senate side, Senator Nelson has introduced a similar proposal with many of the same items.

Senator Bentsen, the chairman of the Joint Economic Committee, has introduced a similar package of legislation. These proposals contain tax credits for investments and research and development, expenses, equipment, and facilities, favorable depreciation treatment for research and development expenditures, favorable treatment for stock options in small innovative firms, tax deferrals on capital gains for investments made in small businesses and/or R. & D.-intensive small businesses; amendments to permit 100 persons and/or corporations to own stock in subchapter S corporations; amendments to provide more favorable treatment for losses in small business, section 1244 stock, et cetera, et cetera.

Perhaps the most remarkable fact of all these proposals is that they all had as their genesis proposals made to task forces on innovation to both the Small Business Administration and the Department of Commerce.

This is what the private sector told Government it needed to facilitate the innovative processes, and this is what the administration, as far as today's testimony and the domestic policy review, has thus far ignored.

I fail to see how we can meaningfully stimulate the private sector into undertaking increased research and development activity without tax incentives.

Further, this proposal ostensibly recognizes the most important role that venture capital plays in the innovative process, and ostensibly attempts to stimulate the creation of venture capital; however, it does virtually nothing in that regard.

First, among the proposals to stimulate the creation of venture capital was included the action already taken by the Department

of the Treasury with respect to the prudent fiduciary rule under ERISA. This merely removes the impediment to a pension fund's investing in small business; it provides no incentive. Second, the proposal to permit SBIC's to make investments together with non-SBIC's leaves me puzzled. Under both sections 304 and 305 of the Small Investment Act of 1958, such conduct is already authorized. While the third proposal to encourage the formation of pools of pension fund money as venture capital is certainly laudable, this appears to be action that can be undertaken without Federal intervention, and should certainly not be the centerpiece for any such proposal.

Finally, I would also like to briefly mention that while the proposal addresses the need to provide small business with a greater share of the Federal Government's research and development dollars, it certainly does not go far enough. A mere directive to do so with OMB assisting the various agencies in goalsetting is certainly not enough teeth to motivate the field personnel. While there may be commitments to utilize small business to a greater extent from the persons in charge of an agency, the fact remains that it is the field personnel that are responsible for putting this money out. At present, the 4 percent of these funds going to small business is absurd, given the fact that small businesses account for a disproportionately large share of all innovation in this country today.

Let me sum up by saying that I sincerely hope, prior to the time the administration commits the proposals outlined today to bill form, regulation, and Executive order, that it will address the concerns which I have raised in these remarks. Revisions in our patent system are fine; technology transfer is fine; improvements in our regulations are fine; however each of these will take time to become effective. The amendments that are necessary must be effective today, and the only way to do this is through changes to our tax laws.

Senator STEVENSON. Congressman Brown.

OPENING STATEMENT BY REPRESENTATIVE BROWN

Mr. BROWN. I would like to commend the administration for developing the Domestic Policy Review on Industrial Innovation. In particular, I wish to congratulate Secretary of Commerce Kreps, and Assistant Secretary of Commerce for Science and Technology, Dr. Baruch, for this undertaking. Given the current economic climate in the United States, this would appear to be a very timely piece of work.

I am looking forward to the recommendations from this administration, as there is a need to stimulate and accelerate innovation and productivity processes throughout the Nation. These recommendations are very important, and hopefully they will provide the groundwork for any new legislation in this area. The benefits which can be realized hold enormous promise for the betterment of our national economy and welfare. They will be felt by business, the worker, and the consumer.

Many of the problems we face today are reflective of the decrease in innovation. The indicators are numerous, and they all point in the same direction. They are a higher rate of inflation, the relative decrease in productivity growth over the past decade, and

the overall trade deficit we are now experiencing. Other disturbing facts are the increasing percentage of U.S. patents issued to foreign nationals and the concomitant decrease in foreign patents issued to U.S. nationals. Also the formation and growth of small high technology companies has not been anywhere as prolific as the fifty's and sixty's, the days of route 128 and Silicon Valley. These are problems which can, in part, be corrected with renewed increases in innovation and productivity.

There are a number of areas for study in dealing with these problems: They are labor, taxation, capital formation, antitrust policies, patents, Federal R. & D. programs, foreign trade and the global market, regulatory systems, high technology small business and the betterment of relations between industry, academia, and the Government. New incentive programs in all of these areas will have to be developed, so that industry will be stimulated, and become more competitive both at home and abroad. The types and amounts of the incentives will not be easily defined, nor may they be easily granted, but the commitment to follow through on such programs is necessary.

In our own subcommittee, with Chairman Fuqua's encouragement, we have initiated a program of study and action on these issues. A work plan on innovation and productivity was formulated, and we have held some 20 sessions of hearings since last June. We have introduced H.R. 4672, a bill patterned after Senator Stevenson's S. 1250. We have drafted a bill to establish a National Technology Foundation, an independent agency to promote technology for the national welfare. Also in draft stage is a Domestic Technology Transfer and Utilization Policy Act. This would provide a national policy to encourage secondary utilization of federally sponsored R. & D. In addition, we have recently completed hearings on Federal patent policy, and are now considering legislation in this area.

Many of these programs will require a more united effort on the part of Congress as a whole. In order to delineate and enact these, it will be necessary to transcend committee jurisdictions and political lines. Already, some movement in this direction has occurred with the formation of House Task Force on Innovation under the guidance of Mr. AuCoin. We need more coordinated efforts like this. Our joint hearing today is another step in this direction, and I commend the chairmen, Mr. Fuqua, Senator Cannon, Senator Nelson, and Mr. Smith for setting up this hearing. I hope we can be successful in our endeavors.

Senator STEVENSON. Congressman Fuqua.

OPENING STATEMENT BY REPRESENTATIVE FUQUA

Mr. FUQUA. I would like to personally welcome our distinguished witnesses this morning and congratulate them on their completion of a formidable task. I look forward to hearing from them the results of the administration's year long Domestic Policy Review on Industrial Innovation.

This intensive study drew on the work of numerous Federal agencies and was coordinated into a single document of recommendations by the Commerce Department. Through the leadership and expertise of Secretary Kreps and Assistant Secretary Jordan

Baruch, the study represents the most comprehensive review of industrial innovation to date. I expect we will hear today what the President decided to recommend to stimulate innovation and productivity, based on the review.

Various committees in Congress have also been concerned with a perceived decline in American innovation over the past decade.

Innovation is a subject both elusive and pervasive. Analyzing it is a little like a doctor trying to treat a patient for loss of appetite. The reasons are often complex and intangible while nevertheless affecting the patient in very specific ways.

Although there is no way to precisely measure the rate of innovation in American industry, there are several indicators which, viewed collectively, point to a disturbing trend. These include R. & D. funds as a portion of the gross national product, our increasing trade deficit, the decline in patents issued to U.S. citizens coupled with a doubling in the number of patents issued to foreign residents, our diminishing rate of productivity and others.

The Committee on Science and Technology has worked on selected aspects of innovation and productivity for a number of years and has launched a major program in this Congress, I would like to commend our subcommittee chairmen, George Brown and Jim Lloyd, for their efforts in this area.

We are pleased with the opportunity this morning to hear the administration's recommendations on the problem.

Senator STEVENSON. Congressman Lloyd.

OPENING STATEMENT BY REPRESENTATIVE LLOYD

Mr. LLOYD. Thank you, Mr. Chairman.

I am pleased to be here this morning because my interest in innovation has been a long-standing one. The administration's report on Domestic Policy Review on Industrial Innovation is both timely and necessary. The lack of innovation creates the productivity crisis that we now face.

Based on Department of Labor statistics, the labor productivity growth declined from 3.2 percent in the 1948–65 period to 2.3 percent in the 1965–73 period, and 0.9 percent in 1973–78.

The implications of this are ominous. With these levels of inflation, stagnation of the economy, and general erosion of our world economic leadership, definite steps must be taken to restore a stable, noninflationary business environment, encourage capital investment, to reduce unnecessary regulations, and increase research and development expenditures.

This will not be easy, but with the cooperative spirit displayed here today, it can be accomplished.

I look forward to hearing the administration's proposal to solve these problems.

Thank you very much, Mr. Chairman.

Senator STEVENSON. Senator Stewart.

Senator STEWART. Mr. Chairman, I would like to commend you and the other committee chairmen and the committees for setting these joint hearings today.

I'm going to introduce an innovation now and say that if you don't get on with the hearing, we might not hear from these excellent witnesses out here. So I'm going to make my statement,

which is supportive of small business, supportive of innovation, but I'm very eager to get on with the testimony and see how we, as members of the Congress and Senate, can solve the problem.

As you know, we face an unusually severe set of national economic problems. On the one hand, we confront the long-term problem of promoting price stability with high employment. We need to find ways to increase productivity, encourage greater returns on investment, reduce the cost of complying with Government regulations, and increase the supply of American goods to the international marketplace. These efforts must be accomplished with out straining responsible fiscal and monetary practices.

On the other hand, we are faced with a challenge to find safe new replacements for critical energy and material resources that are being depleted. This must be done without an interuption in industrial output.

History shows that the greatness of the United States has been built upon our ability to turn old problems into new opportunities through the processes of innovation. In addition, innovation has consistently accounted for between 40 and 50 percent of all economic growth in this country. This Nation depends upon our intelligent use of the processes of innovation to provide a positive transition to the future.

The Senate Select Committee on Small Business has proved that small businesses account for more than one-half of all American innovation. Smaller businesses—with less than 1,000 employees—produce their remarketable share of innovation at one-fourth the cost of medium-sized firms and at one twenty-fourth the cost of large firms—with more than 10,000 employees. Smaller businesses have made this exceptional contribution to national security and prosperity in spite of short-sighted Government policy that does not provide a healthy climate for the full utilization of their capacity.

I want to see the even greater contributions to the welfare of the Nation that would flow from innovative small businesses when we implement an overall Government policy that gives small businesses an even chance. We must implement a Government policy that will increase research and development funds awarded to small business from the current low level of 3½ percent to a level that more accurately reflects our faith in the impressive innovative contributions of America's small business men and women. We need an intelligent national policy that will change Federal tax, pension fund, and security policies to stimulate the availability of capital for starting and expanding small innovative business ventures. We need a policy that establishes a two-tier regulatory structure in recognition of the differing needs and resources of a small business and a large corporation. A smart policy will strengthen the patent system and reduce the costs of patent litigation to small business. A committed policy will require compulsory set-aside contracts for small business in Federal agency procurements in order to reduce the real costs of agency operations.

The challenge of stimulating industrial innovation by redesigning Federal policies has been enthusiastically discussed by every administration since 1967. Not much has come from their discussion. I am pleased to hear today from an administration that has

promised cooperative leadership in this area and has committed more than 1 year to a 30-agency review of the issues involved.

Our current administration has told us before that finding appropriate solutions to the economic problems facing our country will require a national commitment that is "the moral equivalent of war." The implication is that from intensified commitment will flow the innovative technological processes that are necessary to overcome our economic dilemma.

The small business men and women in this country can and will provide the impetus for solving the critical problems of a declining productivity rate, a declining innovative capability and a growing trade imbalance—if we remove the crippling shackles of unnecessary Government interference. We need our small business community, perhaps more now then ever before. Let's act now to translate that need and our faith into the Government policy that guides this country.

The presence of four committees meeting jointly here today and tomorrow is proof of the intense moral commitment that Congress has for solving the problems confronting us.

The key is to develop a strategy that will promote total production of innovative technology within the country and that key must necessarily focus on small business. We intend to develop and implement a working national strategy to loosen the knots of Government regulation that tie up so much of the creative spirit in the small businesses of this country.

We welcome our witnesses from the administration and are anxious to hear their suggestions on how to fully utilize the vast potential of small business in a comprehensive national innovation strategy. Thank you.

Senator STEVENSON. Mr. Flippo?

Mr. FLIPPO. Thank you, Mr. Chairman.

In the interest of getting to some very important testimony, I will refrain from making a statement for the record.

Thank you, sir.

Senator STEVENSON. Congressman Carney?

OPENING STATEMENT BY REPRESENTATIVE CARNEY

Mr. CARNEY. Thank you, Mr. Chairman. Thank you very much. In the interest of time, I also will refrain from a lengthy statement. I just want to say that it is a pleasure to be present at this Joint Conference, and I look forward to hearing the testimony of our distinguished witnesses. Innovation has been a hallmark for American industry in the past, and, again, I am interested in hearing your comments.

Senator STEVENSON. Representative Walker?

Mr. WALKER. Thank you, Mr. Chairman.

I have no statement for the record at this time.

Senator STEVENSON. Representative Ertel?

Mr. ERTEL. Thank you, Mr. Chairman.

I, too, have no statement for the record at this time. I am very interested in hearing what the witnesses have to say.

Senator STEVENSON. This is an innovative hearing.

I was afraid that what started as a quadrilateral hearing might end up as a quadriplegic.

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Our first witness——

Senator SCHMITT. Mr. Chairman——

Senator STEVENSON. I beg your pardon. I have to take back what I said. Senator Schmitt.

OPENING STATEMENT BY SENATOR SCHMITT

Senator SCHMITT. Well, Mr. Chairman, I just want to say how happy I am to join with you in one of a long series of hearings related directly or indirectly to innovation.

I have not had a chance to study what the administration proposed today as an innovation policy. I will do that and presumably will have some comments later.

Again there probably is no more important long-term endeavor that you and I and others have undertaken together, and I'm happy once again to be with you on this one.

Senator STEVENSON. Thank you, sir. I have opening statements from Senators Cannon and Kassebaum. I will insert in the record at this point.

[The statements follow:]

OPENING STATEMENT BY SENATOR CANNON

Today the Committee on Commerce, Science, and Transportation joins with the Senate Small Business Committee, the House Science and Technology Committee, and the House Small Business Committee in holding a hearing to receive the President's proposals to stimulate U.S. industrial technology and innovation. These proposals are the product of a major effort, chaired by the Secretary of Commerce, involving 15 Federal agencies and offices with input from industry, labor, academia, and the general public. We welcome the opportunity to review this set of proposals.

Concern with industrial innovation is not new to this administration or Congress. Various efforts and studies have been conducted during the past two decades by government and non-government groups. Unfortunately, practically nothing resulted from all the previous efforts. I hope we are able to do better this time.

The President's proposals currently before the Senate, and those suggested by non-governmental study groups, all fall within the purview of several congressional committees. For all of these individual proposals to receive thorough consideration, it would be helpful if the various committees involved could develop a means to cooperate and handle the proposals as an interrelated package. To help in this effort in the Senate, I am writing to the chairmen of those Senate committees with responsibility in this area to seek their cooperation in considering the various proposals. As a start, I will be asking them to work with me in establishing an informal multi-committee staff task force. This group could help serve as a way to share information, review the various proposals and coordinate Senate efforts.

While I am unable to attend today, I wish to congratulate Secretary Kreps for her effort in seeking ways to stimulate industrial technology and innovation. It is only befitting the excellent and conscientious efforts of Madam Secretary to tackle significant and difficult public policy issues that she take the opportunity on her last day as a cabinet officer so vital to the future of the U.S. economy. I want to assure her and others that we will be giving her testimony and the President's proposals serious consideration.

OPENING STATEMENT BY SENATOR KASSEBAUM

Mr. Chairman, I am happy to be here for a discussion of the Administration's program designed to stimulate innovation in the United States. Innovation is one of the central factors underlying productivity and increased productivity in turn carries the promise of reducing inflation and restoring long-term stability to our economy. The effects of 13 percent inflation and declining productivity that have plagued our economy in recent months serve to highlight the importance of these hearings.

Americans have always been a very inventive people and I believe that we have not lost this intrinsic ability. What we do lack is an environment that fosters

innovation. The Federal government has the power to create such an environment through the proper use of its tax, regulatory patent and procurement policies. Innovation can provide leverage for lessening the impact of inflation, improving our balance of trade and assuring us of continued growth of employment. For these reasons, the Administration invested nearly 18 months of time in a comprehensive Cabinet level review of Federal Policies on Industrial Innovation.

The Congressional Committees represented here today have all demonstrated their desire to improve the climate for innovation in the United States by holding hearings on many of the central issues. We have all been awaiting the Administration's program with the hope that they can supply the impetus to set a comprehensive program in motion during the 96th Congress.

We are all aware of the symptoms of the problem we face in this area. In the last 15 years, the percentage of our Gross National Product spent on research and development has declined steadily, down from nearly 3 percent to 2.2 percent. Foreign patents in the U.S. have increased sharply and our share of major technological innovations has been cut.

No single legislative proposal can adequately address all the underlying causes of our declining innovation. Furthermore, turning to government bureaucracies for solutions all too often results in the creation of additional problems. We must have a comprehensive program that takes the steps necessary to increase our rate of industrial innovation. The policies we adopt must focus on the long-term health of our rate of innovation. The "quick-fix" approach used in the past has placed us in the predicament in which we now find ourselves. Long term stability depends on a through reform of the policies that affect innovation. I hope that we can enact such legislation in the near future.

Thank you, Mr. Chairman.

Senator STEVENSON. And now our first witness is the distinguished Secretary of Commerce, and this may be her last appearance before the Congress. I believe Secretary Kreps is within about a week of her departure from the Government. It is a busy week, and we are all the more grateful to her for her attendance at this meeting. And more so for the skillful, conscientious, capable job that she has done as Secretary of Commerce, and in bringing the attention of the executive branch to the need for innovation.

It's always a pleasure to welcome you, Madam Secretary. Please proceed.

STATEMENTS OF HON. JUANITA KREPS, SECRETARY OF COMMERCE, DEPARTMENT OF COMMERCE; ACCOMPANIED BY DR. JORDAN J. BARUCH, ASSISTANT SECRETARY OF COMMERCE FOR SCIENCE AND TECHNOLOGY; AND DR. FRANK PRESS, DIRECTOR, OFFICE OF SCIENCE AND TECHNOLOGY POLICY

Secretary KREPS. Thank you, Mr. Chairman and members of the assembled committees.

It is a pleasure to be here, and since this is my last week in office, it is a particular pleasure to have an opportunity to talk about industrial innovation, a subject on which our Department has spent a great deal of time in the past year. Dr. Press, the President's Science Adviser, and Dr. Jordan Baruch, Assistant Secretary for Science and Technology, and I have just come from the White House where the President made a very forceful statement on the need for action in this area and presented a detailed outline of his program.

I shall for my part simply speak to the importance of what it is we are attempting to do and leave a discussion of the details of the program to Dr. Baruch and Dr. Press.

Innovation underlies our ability to promote the health, welfare, and well-being and prosperity of the American people. It is of

profound concern to the President and his administration. We realize that innovation is also a very deep concern to your committees.

Your committees are representative of the interest of the Congress in science, technology and commerce. Your concerns for science and technology are concerns for the advancement of knowledge, for the betterment of mankind. Your concerns for the Nation's commerce are concerns for the capacity of American business and industry, large and small, to embody that knowledge in creating the goods and services available to our people and to others throughout the world.

In large measure, the substance upon which the future well-being of our Nation depends, falls within your combined jurisdictions.

Industrial innovation is the process of advancing the quality, availability and commercial success of goods and services through the development and application of knowledge. It advances science and technology, and integrates these advances into new products and processes.

It is difficult to overstate the pervasive importance of industrial innovation to our economy and our society. In the long run, innovation determines the growth and strength of our economy, the ability of our Nation to provide for human needs and individual wants, and the quality of life of our people.

It determines the range, quality and price of the goods and services we produce and thereby the vitality and world competitiveness of our industry.

Innovation is also critical to the attainment of important national goals—improving the quality of health care, conserving and using efficiently our national resources, reducing our dependence on nonrenewable sources of energy, assuring the defense of our Nation, and advancing the living conditions of our people.

By promoting the strength of our economy through innovation, we dampen inflation, we enhance our balance of trade, we create jobs.

The strength of our Nation, the faith in our ability as a people to solve problems are premised on our scientific, technological and industrial preeminence.

However, our role as a leader in innovation and technological development can no longer be taken for granted, as you have noted, Mr. Chairman.

A possible weakening of the status of industrial innovation in the United States has been a concern of the President since the beginning of his administration. Disturbing trends have been seen in the level of support for our colleges and universities; the near stagnancy of support for basic research; increasing competitiveness and domestic penetration of foreign technology-based industry; our poor balance-of-trade performance; increasingly scarce and costly energy and natural resources; a diminished rate of economic growth; an apparently short-term, low-risk, high-profit orientation of industry; and a lagging growth rate of total factor productivity—perhaps one of the best available measures of our country's preeminence in technology.

In short, the preeminence of our industry and of our scientific and technological capabilities is being called into question.

The policies of the Federal Government must address this important national concern. The Federal Government must insure a healthy economic, social, intellectual and institutional environment in which our private sector can advance the state of the art of production in ways that are both socially beneficial and economically competitive.

The Government must maintain an environment conducive to efforts by the research and industrial communities to make better use of knowledge, technologies, and problem-solving techniques that are already available and, through innovation, to find new ways to provide for our national needs.

Historically, the appropriate role of the Federal Government at the macroeconomic level has not been clear. Except for national security and Government procurement, we have generally confined the role of the Federal Government to aiding small and minority businesses, to the agricultural sector, and to distressed industries.

In these cases, we have provided financial support, management and technical assistance, and support for research and development.

More recently in the fields of energy and transportation, we have supported industry research and development programs for new fuels and fuel-efficient technologies.

In short, the direct support which the Government has heretofore provided has been on an ad hoc basis by individual agencies acting in accordance with specific legislative mandates or individual agency policies.

We have not in the past advocated a strong role for the Government with regard to the more general promotion of technology and industrial development and the improvement of productivity in general.

At the same time, however, many advanced Western nations—our competitors in international trade—have favored an active Government role in support of key industrial sectors.

Recognizing the fundamental importance of enhanced innovation, and recognizing that it is illusory to believe that the impact of Federal policies on innovation can be neutral, the President has taken actions to assure that the Federal Government is a positive, supportive force in directly furthering the industrial strength and competitiveness of this Nation.

The President's decisions initiate new programs and represent significant improvements in the quality and effectiveness of existing Federal programs and policies.

Individually, and in the aggregate, they will improve innovative activity in this Nation. Dr. Press and Assistant Secretary Baruch will describe the specific actions to be taken, and they will also be glad to respond to questions on the details.

The President's decisions are based on a year and a half of intensive work. Approximately 28 Federal agencies, 250 Government officials, and 500 representatives of the business, labor, public interest, and academic communities were involved in the effort.

In making his decisions, the President has sought to define an appropriate range and level of Federal activity consistent with the needs of our society and consistent with the framework of our economic system.

Because these policies represent something of a break with the past, the President has also sought to determine the appropriate scale of activities to be taken initially.

Accordingly, the President is proposing a number of steps, all of which recognize the need to rely upon the private sector, which will continue to have the ultimate responsibility for innovation within our economic system.

The lengthy process of developing the President's program has itself been important. It has heightened the awareness of the Federal Government and the general public to the importance of industrial innovation.

The process has without question improved the quality of dialog between Government and industry. Through the actions announced by the President, and the actions the President has called upon the Congress to take, we hope to establish a more effective partnership among Government, industry, labor and the academic research community.

The ultimate aim of that partnership will be the advancement of our societal goals and the assurance of our future economic security.

Mr. Chairman, may I state in closing that it has been a great joy to work with you through the past 3 years. We met first, you and I, early in the administration, when I was working with the Senate on the development of the Arab oil boycott regulations.

We were able, with your help, to reach a consensus on how to cope with these very difficult issues, and I trust, Mr. Chairman, that we can make some progress in the important area that you are now addressing.

I thank you for your support, and I am delighted to be here. Thank you.

Senator STEVENSON. Thank you, Madam Secretary.

And before I recognize the others, let me say that earlier Senator Cannon, the chairman of the Senate Commerce Committee, asked me to say this on his behalf.

The President's proposals before the Senate and those suggested by nongovernmental study groups all fall within the purview of several congressional committees. For all of these have individual proposals to receive thorough consideration, it would be helpful if the various committees involved could develop the means to cooperate and handle the proposals as an interrelated package. To help in this effort in the Senate, I am writing to the chairmen of those Senate committees with responsibility in this area to seek their cooperation in considering the various proposals. As a start I would be asking them to work with me in establishing an informal multicommittee staff task force. This group could help serve as a way to share information, review the various proposals and coordinate Senate efforts.

While I am unable to attend today, I congratulate Secretary Kreps for her efforts in seeking ways to stimulate industrial technology and innovation. It is only befitting the excellent and conscientious efforts of Madam Secretary to tackle significant and difficult public policy issues that she take the opportunity on her last week as a Cabinet officer to appear before this body, to appear and encourage us to act in an area so vital to the U.S. economy. I

assure her that we will give her testimony and the President's proposals our serious consideration.

He speaks for all of us, Madam Secretary. We are grateful for your services as Secretary of Commerce, and for your presence here today, and we all wish you well in the future.

I know that you do have a busy schedule, and so I will not ask any questions.

Are there questions or comments of the members?

If not, thank you.

Our next witness is Dr. Frank Press, Director of the Office of Science and Technology Policy. Dr. Press.

Dr. PRESS. Mr. Chairman, Members of the Senate and House, I am pleased to appear before your committees to discuss the administration's views and decisions related to the domestic policy review of industrial innovation.

The state of this Nation's industrial innovation and its effects on our economic and social well-being, have been a matter of major concern to this administration, as they have been to the Congress and to the American people.

We are the world's leading industrial Nation, and this fact accounts not only for our own high standard of living, but for our position of strength and influence throughout the world, and for much of the economic stability and progress enjoyed throughout the world.

We arrived at that position through the application of considerable ingenuity, enterprise, and innovation in a country of relatively abundant resources. We must now apply even more of those qualities as we enter an era of diminished resources, increased competition and continued high expectations, domestically and globally.

Our concern over industrial innovation stems not only from this basic problem, but from the perception that in recent years we have experienced a decline in our innovation, particularly vis-a-vis the advances of other nations, whose technological and industrial advances should have been expected.

As the President stated in his remarks to the National Academy of Sciences last April:

> We tend to think of the inventiveness of American industry as a kind of inevitable birthright, but complacency is the last thing we can afford. Too many of our industries in this country have gone stale. Innovative industries in countries like Japan and Germany put too many of ours to shame. Our competitiveness has begun to slip.

The President went on to state that the American free enterprise system still has the vigor and the capabilities to prevail, but that we must nurture an environment in which new ideas and fresh approaches can be put to use.

The Federal Government bears a large responsibility for this. And it is the recognition of the importance of innovation by the President that was the basis for the study we are discussing today.

The concern about industrial innovation and the competitiveness of our domestic industry in the international marketplace has led to a wide public discussion over the last several years. There have been a number of significant studies, all of which have contributed to the understanding of one facet or another of the innovation process.

We are also keenly aware of the interest of the Congress as represented by the four committees meeting today, and the congressional concern about innovation, and we look forward to working with the Congress in the months ahead.

I'm confident that together we can make significant progress in establishing an improved national climate for innovation. Although there have been many studies of the innovation process, I think it's rather unprecedented that a President has sent the message to Congress with concrete proposals in response to the innovation problem.

In introducing our discussion of the innovation review and the President's decisions announced today, I would like the committees to understand that this activity is, for us, one of a number of steps that, taken together, all substantially contribute to an improved climate for innovation.

Previously in this administration actions in areas of regulatory reform and enhanced support of research will have a significant impact on innovation. The administration has underway an intensive and aggressive regulatory reform program. This program laid out in the President's March 26 message to the Congress on regulatory reform, emphasizes increased care and rationality in regulation, and better management of the regulatory process. It is no alteration of our strong commitment to the environment and public health and safety.

A better examination of all the impacts of regulation, and increased care in the design of regulations, includes consideration of the impact on innovation.

This improved management of the regulatory process and increased pressure for cost effectiveness will have identifiable benefits for innovation.

For example, the bubble concept to be adopted by EPA for controlling air pollution from whole industrial plants rather than individual processes, allows improvements and modifications in those processes which might not otherwise be permitted.

In many ways our currently regulatory structure is already more enlightened and sensitive to innovation issues than it has been in the past, but it is evident to all of us who have been addressing these issues that much remains to be done.

All of this, however, is a backdrop for the decisions that we will report today.

Turning to another example of an area where the administration's ongoing policies will benefit innovation, we would like to remind the committees of some of our efforts in R. & D.

The results of the innovation review make abundantly clear how extensively innovation relies on R. & D.—especially exploratory, long-term research.

These are, of course, areas that have been of continuing concern to the President from the early days of his administration.

The President has developed and articulated clear guidelines with respect to the proper governmental support and control of R. & D.

For example, he has given personal attention to restoring the support of basic research, which is one of the vital links in the innovation process.

The support of basic research has been increased 25 percent in the past 2 years. In his science and technology message to the Congress last March, the President also emphasized his concern for a broad base support of R. & D., especially basic research. But we must continually seek new mechanisms for nurturing the links between R. & D. and industrial innovation.

In other words, the Government itself must be innovative as it develops and implements new policies. While the review identifies these areas, as I have already mentioned as critical factors in innovation, it also made quite clear that there are many important economic dimensions as well.

Probably no single factor would have a more beneficial influence on innovation than bringing inflation under control. Thus, the administration's economic policies, while not a component of the innovation review, are critically important.

This includes, of course, the role of the tax laws. Many tax relief proposals were suggested. Most of these, such as accelerated depreciation and other measures to enhance capital formation, could have an important effect on industrial innovation or renovation of capital plant.

In the overall context of the administration's economic and tax reform policies, the administration will be sensitive to the importance of spurring innovation as it considers tax policy and fiscal policies for the coming fiscal year.

I would like now to turn to specific results of the review and highlight some of the President's decisions. There are nine areas where the President has made some specific decisions regarding innovation.

Let me state these so you can see the whole picture at this time.

Enhancing the transfer of technical information; improving scientific knowledge, and new technical advances; improving the patent system, clarifying antitrust policy, fostering the development of smaller innovative firms, improving Federal procurement policy so as to make it more sensitive to its effect on innovation, improving our regulatory system for the same purpose; facilitating labor-management adjustment to innovation, and maintaining an overall supportive attitude throughout the Government toward innovation.

I will review some of these and Secretary Baruch will cover the others.

Let me describe the industry-university cooperative plan for research and development. This would fall under the category of increasing the kinds of information we need for innovation.

In recent years the scientific technological expertise in American universities has not been used as effectively as possible in promoting industrial innovation.

In partial response to this problem, the National Science Foundation established a program in 1978 to support research projects proposed jointly by industry and university research terms.

Industry shares in the cost of these projects. Although modest in size, this program has already shown success in the improved interaction between those sectors.

It is now time to expand and strengthen this effort. Therefore, the President will propose an obligation of $20 million in new

funds to the National Science Foundation in fiscal year 1981, with subsequent support at a similar level, and the extension of the NSF program concept to other agencies.

NSF will work with other agencies to initiate industry-university cooperative R. & D. programs. Our plans call for building this program toward a goal of $150 million annually.

I expect to see a very positive response from industry to this new commitment, including significant industrial funding.

Antitrust policies. I want to discuss the special role that our antitrust laws play in promoting innovation. By fostering competition, antitrust policies provide a continuous stimulant for developing those innovations that provide a competitive edge.

Unfortunately, these laws sometimes discourage companies from being too successful, and they are mistakenly understood to prevent cooperative activity, even in cases where cooperation will foster innovation without diminishing competition.

Indeed, it was just this misunderstanding that was a stumbling block we had to overcome in shaping the cooperative automotive research program that was announced following the President's meeting with automotive executives last year.

Several specific actions will be undertaken to reduce this misunderstanding.

The Department of Justice will prepare and issue a statement clearly setting forth its position on collaboration among firms in research and development. This statement will set a positive tone concerning cooperation in R. & D. in appropriate cases.

To address the perception that antitrust policy inhibits innovation, and to improve communication between industry, the Justice Department and the Federal Trade Commission, the President has instructed the Justice and Commerce Departments to join the FTC in initiating a dialog with industry about innovation, antitrust policy formulation, and enforcement.

This dialog will lead to broad dissemination of the existing opinions of the FTC and Justice Department on innovation-related issues.

We hope that these actions will remove many misapprehensions about antitrust policies and will, over time, promote both innovation and competition in the best interests of the Nation.

Innovation in small business. Let me address briefly the role of small business in the innovation process. Both large and small firms innovate, but approximately 50 percent of all innovations—and nearly most of all radical innovations—historically have come from small technology-based firms.

Moreover, 40 times as many jobs per dollar of increased sales are created by small, high-technology firms as by larger firms in stable industries.

Nevertheless, small firms often are unable to make the transition to large production that successful innovation frequently requires, and large firms frequently rely on the acquisition of small, more innovative firms for the introduction of significant changes.

Such acquisitions benefit both parties, providing significant incentive to the entrepreneur in the small firm. Actions to improve the rate of startup and growth of small technology-based firms are supported, therefore, by both small and big business.

The major problems facing entrepreneurs have been startup capital, second-round financing, and early management assistance. The new capital gains tax structure has increased the availability of second-round venture capital from private sources, and many of the other proposals being adopted by the President will encourage small R. & D. firms and businesses.

Nevertheless, to provide additional support to smaller innovative firms and to prepare for the White House Conference on Small Business, the President plans to implement the following initiatives:

No. 1. The NSF's small business innovation research program: This program provides funding to small companies for development of a venture analysis for new products, and demonstration of technological feasibility.

After only 2 years of operation, this program is widely recognized and applauded by both the small and big business communities. It has resulted in a number of projects for which follow-on private sector funding has been pledged.

Accordingly, the administration intends to expand the NSF program through an increase in fiscal year 1981 of $10 million. Moreover, the NSF will be asked to assist mission agencies having both assistance authority and sponsorship of R. & D. to develop analogous programs. OMB will coordinate the development of agency plans, working toward a goal of approximately $150 million annual funding.

No. 2. Corporations for industrial development, for innovative development: We believe that the States and multistate regions should join these efforts to spur innovation by establishing State or regional corporations for industrial development.

The functions of these CID's would include direct equity funding for the startup of firms that wish to develop and bring to market a promising, but high-risk innovation; providing guidance and advice to potential applicants to the NSF's program, and serving as the necessary second-round guarantor in appropriate cases; providing early management assistance to firms that are funded by NSF; when otherwise qualified, acting as the recipient of economic development assistance funds for the State or region.

In order to lead the way and demonstrate the feasibility of CID's, the administration plans to establish a pilot program in fiscal year 1981 involving two regions in the United States. Our plans call for one of these to be located in an industrial region, and the other in a less industrialized State or region.

Federal support will be in the form of loans up to $4 million per center, on the condition that the region provide matching funds for this experimental program.

No. 3. Federal R. & D. support: Again this is in the category of small business, as was the preceding item.

We have learned that funding for new R. & D. is a constant problem for small firms. Indeed, small businesses, given their number and the significance of their role in the innovation process, receive a disproportionately small percentage of Federal R. & D. dollars. This is especially true in view of the much higher yield of innovation per R. & D. dollar coming from small as compared to large firms. Accordingly, the administration will ask each agency

that contracts for R. & D. services to develop policies that insure that small businesses are not unfairly excluded from competition for contracts; publicize through the Small Business Administration and other mechanisms opportunities for bidding that are appropriate to small businesses; and to report annually to OMB their progress toward increasing the small business participation.

No. 4. Venture capital availability: We expect an increase in the demand for second-round financing. While the capital gains tax changes have increased the flow from private sector investors, the flow will be further increased by the fact that the administration has already modified the ERISA "prudent man" rule to increase the availability of capital from pension funds going to innovative small firms.

In addition, the administration is taking the following steps to improve venture capital availability:

The Administrator of the Small Business Administration will change the SBA regulations to permit small business investment companies and private sector venture capital firms to coinvest in a small firm.

We are requesting the establishment of an interagency committee, chaired by the Administrators of ERISA and the SBA, to examine regulatory changes or other means needed to stimulate investment in small- and medium-sized technology-based firms by nontaxable pension and endowment funds.

We are committing the Government to monitor the availability of venture capital so that additional actions can be taken, should the problem reemerge.

As a symbolic measure, the President plans to establish an annual award for technological innovation, to encourage U.S. industry, and to symbolize the Government's commitment toward innovation.

The proposals that the President is making are an important first step, and I would like to emphasize that this is just the beginning of the process, and more will be forthcoming in the future.

We will consider a tax package and other economic issues. We will be sensitive to opportunities and proposed measures to enhance the capabilities of small, high-technology firms and large industrial corporations, but most important, we view our activity as one that contributes to the partnership between industry and Government, between the Nation's scientific, technological, and business leadership.

I would now like to introduce Assistant Secretary of Commerce Jordan Baruch, who will describe some of the other decisions and give you the overview of decisions that have been made by the President.

I would like to add that Dr. Baruch has essentially been the point man, the leading individual in the administration, that has brought all of this together in the form of a proposal.

Senator STEVENSON. Thank you, Dr. Press.

You both deserve much praise for bringing this effort this far along. And if there are no objections, we will proceed with Dr. Baruch's testimony, and then get to questions. When your testimo-

ny concludes, I will yield the gavel to my distinguished colleague, Representative Fuqua.

Dr. Baruch.

Dr. BARUCH. Thank you, Mr. Chairman.

Dr. Press has described many of the major provisions of the President's program. I understand that you have before you the fact sheet and charts on the program. I do not have a written statement. If you wish, I can walk through the points that Dr. Press did not cover, or I can respond to any questions that may have already come to your minds.

Senator STEVENSON. Well, if there is no objection, I think it would be in our interest to proceed as Dr. Press suggested, by covering the points which he did not cover, and then we will have some questions.

Dr. BARUCH. The major overview taken by the study that led to the recommendations for the President was that the Federal Government impacts on the private sector where industrial innovation takes place in two ways:

It can make available by one route or another the resources that a firm needs so that it will be able to innovate and it can make available incentives so that a firm will decide to innovate.

We have a very good idea from past studies as to what incentives will make a decisionmaker respond. We also have a good idea of the kind of resources that are essential, if innovation is to proceed within a firm.

The nine areas that Dr. Press mentioned are aimed at either providing resources that are in short supply to the firm, or providing the incentive.

It's worth noting that we have not picked one area or two areas in which to concentrate as a panacea for our problems in industrial innovation. There is no such panacea.

If any of the major resources—knowledge, competent people, financing and time—are missing, innovation can't take place.

If the incentives are missing, innovation will not take place. So Federal strategy to stimulate innovation must address all of the areas which I mentioned.

One of the reasons that domestic policy review process was initiated was so that we could do this, because there are 28 Government agencies that were involved in figuring out the appropriate pressure points for providing incentive resources.

Under the heading of resources, one of those that is necessary but, of course, not sufficient, is scientific and technical knowledge for industry.

Dr. Press described the industry-university joint research program aimed at creating new technical knowledge relative to industrial innovation by enhancing the joint participation of universities and industry and research programs.

However, we have a whole area of the utilization that exists. We spend $10 billion a year in the Federal laboratory and it behooves society to insure it's coupled as closely as possible to our industrial sector.

The President is creating, therefore, an incentive for the utilization of Federal technology under the National Technical Informa-

tion Service to try to couple the flow of knowledge from the Federal research establishment to private industry.

This is particularly important for smaller firms who don't have the representative networks that some of the larger companies do that can do some of this job.

We also have a problem because we have never relied much on foreign technical information for the advancement of our industries.

The flow we've been concerned with has always been in the other direction.

Now, however, with the increased industrial activity of other nations, the President's program will gather, catalog, and disseminate technical information from abroad for use by industry.

Four million patents now reside in our patent files; if you happen to be a patent examiner or an attorney especially trained in patent searching, you can get access to them.

If, however, you're an inventor, engineer, innovator, they're almost useless. And yet the quid pro quo for granting a limited monopoly was to make that technical knowledge available to society.

So the President is proposing a reorganization of those files to insure their increased use by the engineering profession. But there are areas of knowledge that are insufficiently attended to, and therefore don't get created; one such area is the area of generic technology.

Generic technologies like welding are the kinds of technologies that underlie the capabilities of a wide range of firms and frequently a wide range of industries.

Each firm has insufficient incentive to invest in these, and yet there are benefits from improvements in those technologies that can bring marked social rewards. The President is proposing the establishment of a cooperative generic technology program to permit such technologies to be developed jointly by firms in one or more industries with financial participation by the Government.

Four such centers are proposed for 1981, three to be administered by the Commerce Department and one by NSF.

One area where the development of new technology is particularly important to society is the development of technologies that can help industry comply with our environmental, health, and safety regulations.

If we think of a regulatory agency as providing public benefits by setting their regulations, we would like the public cost of those benefits to be minimized. As a result, in their crosscutting budget analysis, the Office of Management and Budget will be reviewing the expenditures of the regulatory agencies for the development of compliance technology, and we will be beefing up that program.

Federal regulation, as mentioned by Dr. Press, is an important area. I'm going to combine it, if I may, with other procurement activities because in the procurement area and in the regulatory area, we are recommending the use of performance specifications; rather than having Government decide what kind of device meets the needs, they will specify what the need is and rely on their immense market pull as a stimulus to private industry to meet those needs innovatively.

In the regulatory area, however, if the time delay between those specifications and compliance is long, technology cannot react; innovation takes time. It is one of the critical resources we can provide in this area.

We can provide it, and the President is providing it by asking the regulatory agencies to extend their time horizon to 5 years in order that technology has a chance to catch up and produce cost effective means of meeting compliance.

One of the other areas of importance in the sense of providing a stimulus to industry is accelerating the clearance rate for agencies that have the responsibility for checking out products for safety or efficacy. Any shortening we can produce of the clearance process moves the starting date of the cash flow closer to the decision point of innovation and increases the potential payout, and therefore increases the rate at which innovation will take place.

One particular area where we have an opportunity to do this is in the Food and Drug Administration where the President is directing the administrator to develop means to utilize foreign data that are gathered when drugs are introduced abroad.

One of the greatest assurances for innovation in the past has been our patent system; patents provide the kind of property rights an investor can use, particularly a small investor can use to make the decision to invest in innovation.

Our patents have fallen into disuse, however, because they have become unreliable and easily challenged.

The President is recommending a major improvement, the patent file classification retrieval systems in the patent office so that an initially issued patent has a greater chance of being valid.

That is not enough, however. Many small firms and large firms hesitate to rely on patents because of the fact that over 50 percent of all patents are held invalid when tested in court. The court process is long and costly.

To shorten that process and make it less costly we will be requesting legislation to broaden the reexamination process used by the Patent Office so that the courts can remand questions regarding validity to the Patent and Trademark Office.

The President has already asked the Congress for a uniform court of patent appeals, and we will be asking further for a way to spread the burden of the Patent Office's costs more equitably over the private sector, rather than from out of public funds. We seek to use maintenance fees to provide for full cost of recovery of special services.

For 30 years, there has been a group of agencies in the Federal Government trying to resolve the confusion in the Government treatment of patents developed under Government-sponsored research.

Dr. Press, as chairman of the Federal Coordinating Council for Science, Engineering, and Technology, established a committee on propagation of information, which has been working on this problem for the past 2 years. They have presented options to the President, and the President is recommending a uniform patent policy which will provide for patent title retention by educational institutions and small businesses. Exclusive licenses will be automatically granted to other Government inventors in any field of

use which the contractor specifies and agrees to commercialize. To provide for a wide range of utilization of these patents, the Government will license others in fields of use other than those specified by the contractors.

Of course, the Government will retain "march-in rights" in any area where the contractor agrees to commercialize and does not do so.

Dr. Press, I think, has covered the remainder of the points in the domestic policy review in the President's message quite thoroughly, and I would be pleased at this time, Mr. Chairman, to answer any questions you or the committee may have.

Senator STEVENSON. Thank you.

Mr. Fuqua?

Mr. FUQUA. Thank you very much, Chairman Stevenson, Dr. Press, and Dr. Baruch.

I want to welcome you and say I'm very delighted that we have the report that we have long awaited. I think it is very constructive and very helpful in many ways.

The patent problem has plagued this country for some time and even more in recent years. You've hit on some of the very important problems, particularly patent policy; you indicated that for a long time you found foreign patents were increasing in numbers in this country faster than U.S. patents.

I don't really have any questions at this time, but I do want to commend you. I think you've done a very fine job in your Domestic Policy Review in addressing some very important issues that we face at this time.

I understand Senator Stewart has a commitment, and I would yield to him to ask any questions he may have.

Senator STEWART. You mentioned—I think Dr. Press did during his testimony—about the research and development money and discussed that, and let me ask you a question with regard to that.

You documented that after the National Science Foundation and NASA raised their percentage to small business participation, the quality of their research output improved. They were better able to accomplish their mission.

However, in this proposal that was presented by you today, the President doesn't recommend that small business participation be raised mandatorily or even at specific targets.

There is only the suggestion that agencies set their own goals.

Do you really think that agencies should independently—not independently, but with some monitoring—do you think this would be effective?

Dr. BARUCH. Mr. Stewart, in our work with the agencies in this area, there was a wide recognition of the value of small businesses to agency missions and a wide recognition of their potential.

It was also clear, however, that the degree of participation, agency by agency, would be very difficult. Everybody recognized NASA's experience and NSF's experience, but each agency, it was felt, needed the chance to feel out the impact of this kind of participation on their own missions.

I have, from my experience with the agencies so far, a very real feeling of a good faith intent to expand their horizons for the use of small businesses in their missions, and did not think it was neces-

sary and did not recommend that there be mandatory targets or goals.

However, I think we will find that in addition to having the agencies set their own goals, there is a strong incentive from the fact that each agency will be reporting to OMB as a central clearinghouse, and my suspicion is——

Senator STEWART. Let me break in at this point: I want to give you the opportunity—doesn't OMB have the right to monitor those agencies today? Is this a new incentive that you're talking about?

Dr. BARUCH. When you couple the right to monitor with the Presidential statement of intent and an expression of good faith intent on the part of the agency heads, I think we have a combination of forces that will markedly increase the participation of small business in Federal R. & D.

Senator STEWART. What weight do you give the National Science Foundation testimony in the previous hearings, that their increases would never have taken place without the statute that mandatorily required it?

Dr. BARUCH. I give that great weight, since that was made by the National Science Foundation, but what I don't do is extrapolate that to the rest of the agencies.

Senator STEWART. How would you make a distinction between the rest of the agencies and the National Science Foundation?

Dr. BARUCH. I think we have a clear expression of determination on the part of the heads of those other agencies to insure increased participation by small business.

Senator STEWART. What would your reaction—the reaction of you two gentlemen be and the reaction of the administration if Congress sets a specific target for small business participation in the agencies' R. & D. programs?

Dr. BARUCH. I can't say what the administration's position would be until such an act took place.

Senator STEWART. What about your position here today?

Dr. BARUCH. If I were here as a private citizen, I would say I think that's a pretty poor idea. I don't think Congress has any better knowledge than the President does of the impact of that decision on performance of the mission agencies.

And I think the wisest course is to get some of that experience from each of the mission agencies before we try to set arbitrary numbers.

Senator STEWART. My idea of the testimony is to step up the ability to meet this problem of the lack of innovation in the country and indicate that without those targeted levels of funding they do not anticipate having the capability to compete for R. & D. funds.

And you indicated—one of you did, I think your testmony—that an increase in educational institutions' research funds has been some 20 percent.

That was one of their biggest competitors in the small business field, and they're very much concerned about being able to compete.

Dr. PRESS. Let me respond to that and some of the other concerns that you have. What is new in this proposal is that OMB will be our means of monitoring the agency action. That hasn't happened

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before. OMB, since it does control the purse strings, is a very powerful force in the administration in seeing that each agency each year improves its support of small businesses in the R. & D. programs.

The success of the NSF program which you referred to has led us to propose not only an increase in the National Science Foundation program, but to disseminate that program throughout the other agencies.

And we hope that we can do that very well, and that we can justify reaching our goal which the President has accepted of some $150 million of funding for the small business innovative research.

That represents a very important first step toward of financing of the kinds of innovations we expect from small business.

So the fact that the President has initiated this program, that his key monitoring agency will track all the progress within the agencies to see if that is satisfactory, and the fact that we want to extend the successful program to other agencies leads me to believe that we're going to make a significant change in participation for small business in R. & D. funds.

Senator STEWART. What is the figure on the R. & D. funds that have been spent by Federal agencies, $30 billion, is that figure a fair figure, $20 billion? I've been given two figures.

Dr. PRESS. It's over $30 billion.

Senator STEWART. You're talking about giving $150 million to small businesses. Is that just from one program?

Dr. PRESS. Small business participation in that sum of money you're talking about, $30 billion, will increase with time and increase agency by agency. Agencies that make unsatisfactory progress will be seen from the White House. The $150 million is a new program.

Senator STEWART. That's a separate program?

Dr. PRESS. A separate program.

Senator STEWART. I was hoping that wasn't your goal.

What is the estimated cost of implementing these recommendations in the first year and then in the fifth year? Do you have any estimates?

Dr. PRESS. We haven't totaled it that way because many of these programs are experimental; if they work well, we will want to expand them. Many of the programs start small and then will grow to goals of—two of these, $150 million each.

I would like to caution you that one shouldn't reach an opinion about the efficacy of this program based upon the dollar value because many of the proposals we are making have no dollars attached to them, Yet they can be extremely significant as far as innovation in the regulatory area and the patent policy area, for example.

Senator STEWART. Mr. Chairman, there is one other question I have. I did want to ask one question about a matter that was raised by—raised by one of the gentlemen testifying.

I think Dr. Press related about the bubble proposal. I've been working on this, and as a matter of personal interest, have you all adopted that policy as a policy that has been accepted by industry now so that it can be used to meet some of the problems we have environmentally, and then free up some capital for innovation?

Are you making that statement here today? If you are, I want to run back to my office and tell people that that has been done by the administration.

Dr. PRESS. I believe the administrator of EPA wants to use this concept increasingly in the future, as is appropriate. He is enthusiastic about it, and as time goes on, I think we will see a shift towards this policy.

At the present time, EPA does have a dual approach.

Senator STEWART. They do have a dual approach, and it is my understanding just from talking to people who are attempting to try the concept in the private sector that regulations are being imposed under the bubble concept, and they make it impossible to use.

It would seem to be a rather unique approach toward making the regulation more flexible.

Could you find out about that for me?

Dr. PRESS. We can find out.

[The following information was subsequently received for the record:]

SUMMARY—EPA'S POLICY FOR ALTERNATIVE EMISSION REDUCTION OPTIONS WITHIN STATE IMPLEMENTATION PLANS OR "THE BUBBLE POLICY"

INTRODUCTION

Compared with any government agency, plant managers have far more information about their plants and have far greater opportunity and incentive to minimize the cost of pollution control requirements. This policy statement encourages industry to use its initiative to reduce the cost of meeting air pollution control requirements for existing plants.

Instead of focusing on individual sources of emission within a plant (such as individual stacks, vents, or other emission points), EPA will view the plant as if it were contained within an imaginary bubble that has a single stack. As long as the emissions from the single stack at the top of the bubble achieve the plant's air quality requirements, the plant may use whatever mix of controls it wishes inside the bubble.

The plant's alternative control strategy must be just as reliable and enforceable as the existing requirements and must continue to meet other requirements of the Clean Air Act. The "bubble" policy is a way to reduce the cost of responsibly meeting air pollution control requirements.

EPA is committed to developing and implementing cost-effective ways to achieve air quality goals. The bubble policy is only one of a series of regulatory reforms under an umbrella called "controlled trading." These reforms achieve their ends by using market mechanisms that enlist industry cooperation rather than antagonism. For example, EPA's offset policy allows industry to build new plants in areas with poor air quality if the increase in emissions from the new plant is more than offset by decreases in emissions from existing plants. In addition, a plant may reduce its emissions below existing requirements and "bank" these emission credits for later use, or it can sell the emission reductions as an offset (or as part of a bubble) to another plant.

EPA hopes that the bubble policy and these other regulatory reforms will reconcile improved air quality with economic growth, encourage firms to develop new ways to control pollution, and enable government and industry to work together to more efficiently meet air quality goals.

BACKGROUND

After EPA proposed the bubble policy on January 18, 1979, it received numerous comments from industry, environmental groups, and the states. The following observations summarize the consensus of each category:

Industry—Although the proposed policy will lead to substantial cost savings, in some cases the savings could be greater if it were less restrictive.

Environmental groups—The proposed policy is not restrictive enough, the cost savings will probably be insignificant, and implementation of the policy could divert limited state resources from other activities, such as enforcement.

States—Some objected to the additional resource burden, while others thought that a national policy was not necessary to encourage industry to develop alternative control strategies.

EPA believes that a national policy is needed to clearly demonstrate the option's availability and to clarify the ground rules for adopting alternative control strategies. In addition, the policy represents a federal commitment to work with the states and with industry to develop and adopt responsible alternative control strategies.

EPA believes that implementing the policy will lead to substantial cost savings. Cost studies for the steel, utilities, and chemicals industries have estimated expected annual savings of 10 to 35 percent for some plants, and far greater savings for others. EPA continues to believe that the potential cost savings merit the state and federal resources that implementing the policy requires.

EPA has carefully designed the policy to minimize the use of state resources by requiring that plants initiate and develop bubble proposals entirely at their own cost. By clarifying the ground rules for alternative control strategies, EPA hopes that plants will be able to prepare complete, adequate, and clear proposals that will be easy to review. Finally, EPA will work closely with the states and with industry to speed the application process, to provide technical assistance to the states, and to minimize the states' resource requirements.

EPA believes that the bubble policy contains adequate safeguards to ensure that it is implemented in an environmentally responsible manner. Each application of the policy must be adopted as a revision to the State Implementation Plan and will be reviewed by the state, EPA, and the public. EPA will insist that all alternative control strategies be equivalent in terms of environmental quality, reliability, and enforceability and be able to fully meet the requirements of the Clean Air Act. In addition, EPA has further clarified the policy to limit or discourage trades that might inadvertently damage the environment or public health.

EPA does not think, however, that the conditions outlined in the policy will substantially diminish potential cost savings. In many cases, industry's objections resulted from a misinterpretation of the policy. Sometimes industry interpreted the policy too conservatively; at other times, the policy simply was not clear enough. EPA has attempted to clarify the policy and discusses the clarifications further in the "Summary of Comments" section of the final policy. In addition, EPA has increased the policy's flexibility. For example, where the proposed policy allowed only a single plant to adopt alternative strategies, the final policy allows several plants to participate in a trade. And where the proposed policy prohibited trades involving open dust emissions (e.g., emissions from unpaved roads or raw material storage piles), the final policy permits such trades under certain circumstances.

EPA believes that the final policy does not compromise progress toward achieving environmental goals, is workable, and provides industry a good opportunity to responsibly reduce the cost of meeting environmental requirements.

THE POLICY

The bubble policy encourages plants to come forward with more efficient ways to meet air pollution control requirements. It specifies the pollutants that firms can include and indicates the factors that they must consider when demonstrating equivalence.

The following summarizes the policy and provides some background as well as some rationale for its conditions:

The policy applies to SIP requirements for existing plants.

The Clean Air Act requires states to prepare State Implementation Plans (SIPs) for attaining the National Ambient Air Quality Standards (NAAQS) for criteria pollutants. These pollutants include particulates, sulfur dioxide (SO_2), and ozone (VOC). EPA has set the NAAQS to protect the nation's health and environment. The states meet these standards by imposing specific requirements on sources to reduce their emissions. The states adopt these requirements as regulations that are the basis of the State Implementation Plan. EPA must review each SIP, which must contain an analysis showing that the state will attain the NAAQS by the statutory deadlines if it implements the controls.

If the SIP requirements are adequate to attain the NAAQS for a pollutant, EPA does not generally specify which pollution control techniques the states should impose specific types of pollution control techniques on plants covered by the SIP.

In such cases, the source may trade off, or "bubble", emissions from different operations within the plant. If the SIP does not demonstrate attainment, then plants may not bubble.

There is an exception to the condition that areas demonstrate attainment before bubbles are allowed. Under certain circumstances, EPA may approve ozone SIPs despite a failure to demonstrate attainment by 1982. Such SIPs must require use of Reasonably Available Control Technology (RACT) for sources of VOC included in Control Techniques Guidelines (CTG) categories. Plants may use bubbles to meet these RACT requirements, but only for those emission points that are within the same CTG category.

This policy does not affect other requirements of the Clean Air Act

This policy may not be used to meet or supersede other requirments of the Clean Air Act. Sources may not, through application of this policy, mitigate or avoid requirements of New Source Performance Standards, the Prevention of Significant Deterioration program, hazardous emissions standards, etc. Because many of these requirements call for the use of specific technology, they may not be bubbled.

This policy applies to existing sources only. Other policies address the use of the bubble concept for new or modified sources, and are cited in the policy statement.

Industry must show that the alternative control strategy is equivalent

The plant must demonstrate that the alternative approach it proposes is equivalent to the SIP requirement in air quality impact, reliability, and enforceability. This demonstration is essential because use of the bubble approach hinges upon the state's actually achieving attainment in the area where the plant is located. If EPA were to approve alternative approaches that are *not* equivalent, then the state's ability to achieve attainment would be jeopardized, and the state would have to impose the more restrictive measures required by the Clean Air Act for nonattainment areas. Approving bubbles in these cases would clearly be unproductive and would not benefit any one.

Thus, the policy identifies and discusses the factors that should be taken into account when determining whether the bubble is equivalent.

The factors for judging equivalence are straightforward

To compare the alternative strategy with the original SIP requirement, it is essential that the state have specific, measurable emission limits for both the original and alternative requirements. Dates for achieving the emission limits as well as interim milestones for emission reduction are also fundamental to any comparison. Without this information, determining the equivalence of the proposed trade is impossible. Therefore, a plant cannot propose to include an emission point in a bubble if the requirements established for that point are unclear—for example, if the plant and the control agency have failed to agree on the plant's control requirements, or if the plant is failing to meet the terms of its agreement. If a plant wishes to include an emission point for which it has no operative compliance agreement, it need only come to agreement with the control agency. Of course, if a plant wishes to bubble an emission point that the SIP does not already control, then the uncontrolled level of emissions is the original SIP requirement.

The plant can perform its demonstration of equivalence at the same level of detail as the SIP demonstration of attainment. Thus, if the state did not use source-specific modeling in the SIP demonstration, the plant must show that the overall emissions from the bubble will not increase. Morever, if the state used atmospheric simulation modeling in the SIP demonstration, the plant should use such modeling to show equivalence for the alternative strategy. Also, if the plant wishes to increase its overall net emissions or involve another plant in the alternative strategy, it must complete a modeling demonstration to ensure that air quality is protected. Because of the serious problems associated with increased emissions (e.g., acid rain), EPA does not encourage plants to proposed bubbles that increase overall emissions.

The demonstration of equivalency should take into account differences in the level of reliability of the control measures or other uncertainties that may arise. For example, the reliability of models to predict air quality impact is generally higher for stack emissions than for open dust emissions. In addition, the models for open dust emissions are more complex and more subject to error. Therefore, modeling demonstrations may not be used as a basis for trading basic controls (such as stack gas cleaning) for controls on open dust emission. In this case, the economic benefits that might result are insufficient to outweigh the risk of having trades approved that would not adequately protect air quality standards. Modeling demonstrations, however, can be used for trades that do not affect the use of basic controls. As an alternative to modeling, plants may demonstrate the equivalence of the alternative

strategy by actually implementing it and using monitor readings—this could constitute an acceptable demonstration of the equivalence of the control of open dust emissions and even basic controls.

The policy prohibits the use of alternative emission strategies to increase the emissions of hazardous pollutants. Sources may trade pollutants currently listed as hazardous under Section 112 of the Clean Air Act only with the same pollutant. For example, a source may increase its emission of asbestos (which is a hazardous particulate) only if there is a compensating decrease of asbestos emissions in the affected geographic area. Pollutants listed as hazardous in the future may also be subject to the same trading restraint, although such restrictions will not be applied retroactively to approved alternative strategies. In addition, hazardous polluntants may be traded with nonhazardous polluntants as long as the emission of the hazardous polluntants is decreased. Finally, regardless of any approved bubble, regulations under Section 112 must be met when they are established.

Overall, the alternative control strategy should be as enforceable as the original SIP requirement. This consideration includes not only the ease and reliability of measuring emissions, but also consideration of the overall resource requirements for ensuring compliance.

Plants may not use this policy to delay compliance

Until EPA formally approves an alternative approach as a SIP revision, the plant must continue to meet its existing SIP requirements, and states must continue to pursue enforcement actions without delay. This is the only way to ensure that the statutory requirements are met and that plants will not use the policy as a means to achieve unwarranted extensions of compliance schedules.

The Clean Air Act provides for extension of compliance dates under some circumstances. If plants require more time to implement alternative control strategies than existing SIP schedules allow, and if they qualify, they may apply for a time extension at the same time the plant proposes the alternative strategy.

EPA will expedite the review of bubbles

The Agency will make every effort to expedite the processing of bubble proposals, especially for those that are straightforward or well prepared. In addition, EPA will work closely with the states to help ensure that proposals are properly prepared and, where reasonable, will take the first steps to review forthcoming bubble proposals simultaneously with the states' review processess.

Dr. PRESS. Let me say that as a result of the domestic information review, which involved the President, the Cabinet, and the Administrator of EPA, that I think there is a sensitivity to innovation in the administration that has not existed before, and that all future regulations, all future policies will be viewed in terms of the impacts on innovation.

That's what is different, and I expect the Administrator of EPA will participate in this program as well as all of us.

There is a sense of the significance of innovation, what we do with it, and its impact.

Senator STEWART. I think it's an excellent program, an excellent idea. I just don't want to see us hamstring it so that it doesn't work. That's all I'm concerned about.

Mr. Chairman, I have other questions that I would like to submit for the record.

Senator STEVENSON. Very well.

[The following information was subsequently received for the record:]

QUESTIONS OF SENATOR STEWART AND THE ANSWERS THERETO

U.S. DEPARTMENT OF COMMERCE,
THE ASSISTANT SECRETARY FOR SCIENCE AND TECHNOLOGY,
Washington, D.C.

Hon. ADLAI E. STEVENSON,
U.S. Senate,
Washington, D.C.

DEAR SENATOR STEVENSON: This is in response to the questions concerning President Carter's program on industrial innovation posed by Senator Stewart which you forwarded to my office.

Many of the questions posed by Senator Stewart concern tax policy, either directly or indirectly. The President's Industrial Innovation Message to Congress specifically recognized the importance of tax incentives to spur innovation. However, the President also recognized that tax policies and changes to these policies for one specific purpose can have major ramifications in other areas. Because of the complex nature of this issue, the President felt it unwise to approach major policy changes in tax policy in an isolated context, but rather to address tax policy in the context of the entire economic picture, including the element of industrial innovation. It would be inappropriate in this letter to discuss either tax policies directly or those aspects of tax policy which are indirectly affected by changes in governmental approaches. Therefore, this letter will not respond to the questions involving tax policy.

The remaining questions posed by Senator Stewart are answered by number as follows:

Question 1. With 30 agencies involved in studying innovation policy don't we need some continuing medium of coordination? A subcommittee of the Council on Productivity—the main responsibility of which would be studies—is the Administration's proposal for "Maintaining Federal Concern." Don't we need a stronger mechanism for this task? Twice in the past there have been councils which give the President advice in technology matters, but there is none now. What would you think of such a council as a part of the President's Office of Science and Technology Policy?

Answer. The domestic policy review on industrial innovation and the President's inititative derived therefrom have resulted in an enhanced awareness of the importance of industrial innovation to the economic health of the nation. It will be the responsibility of the Assistant Secretary of Commerce for Science and Technology to maintain a general oversight of the progress made towards governmental assistance to promote industrial innovation. Problems that may arise as a result of these initiatives will be identified by this Office and solutions proposed. In addition, the Office will continue to study and to propose new initiatives which derive from the experience gained from these new initiatives to further promote the development of industrial innovation in the private sector.

The new subcommittee of the Council of Productivity will have as its main objective the same goals as enunciated above for the Office of the Assistant Secretary. The Department of Commerce is expected to play a leading role in the operation of the subcommittee of the Council of Productivity. As such, this subcommittee will provide guidance and consultation to the Assistant Secretary and will offer a mechanism whereby various problems can be resolved through either individual agencies or cooperative agency action. A further objective of the subcommittee will be to coordinate programs which are designed to promote innovation in several different areas.

These mechanisms give promise that a satisfactory and productive approach to the entire problem will develop. Unless a problem arises that is not currently foreseen, there is no need for a stronger mechanism.

Question 2. What incentives would agencies have to raise the small business percentage under the President's program that they do not have now? (e.g., they could have the improvements in quality now—see excerpts, attached; and OMB now monitors them.)

Answer. The President in his industrial innovation initiatives has directed each agency to develop policies which will ensure that small business will receive its fair share of contractual effort for which it is qualified. The President's directive coupled with a growing realization in each agency of the Federal government that small businesses are an extraordinary effective mechanism for innovation activities, is expected to result in an increased effort on the part of agencies which issue contracts appropriate for small businesses. Reporting requirements to OMB, although currently in existence, will receive increased emphasis because of the President's directives.

Question 3. What data did the Domestic Policy Review use regarding the establishment of new technology-based enterprises over the past decade?

Answer. The Domestic Policy Review (DPR) used an extensive bibliography which pertained to the establishment of new technology-based enterprises. Some of these documents covered innovative activity over the past decade, while others covered innovative activities for a longer or shorter period of time. Others were directed towards innovative endeavors in the particular areas, at times chosen on a random basis. A partial bibliography is enclosed; copies of the reports referenced in this bibliography have already been sent to you. A complete bibliography of all reports utilized in the DPR process is now being compiled.

Question 7. Is it more difficult now than a decade ago to attract highly talented innovators and entrepreneurs from large companies to new ventures?

Answer. This question presents complex issues which the Administration is studying in the context of the entire economic picture. Several of the President's initiatives are expected to encourage new small business venture including the NSF Small Business Venture Program, the Corporations for Innovation Development, and SBA publicity regarding bidding opportunities.

Question 9. What did the Domestic Policy Review learn about the impact of inflation on decisions to conduct R. & D. and the performance of R. & D.?

Answer. The Domestic Policy Review did not study specifically the impact of inflation on decisions to conduct R. & D. An article written by Peter Drucker appeared in Science this past summer which discusses this issue and which represents one interpretation of the impact of inflation upon the decision-making process. A copy of this article is attached.

Question 10. Are there markets or industries where stricter enforcement of anti-trust laws ease the entry of small high-technology businesses?

Answer. Innovation is only one of many societal concerns that must be considered in the formulation and enhancement of anti-trust policy. Looking at this aspect, the Domestic Policy Review examined the relationship between competitiveness and rate of innovation of an industry. This is, of course, related to the vigor of anti-trust policy and its effect on innovation. A paper was prepared on this subject by Burton Klein under a contract to MIT (a copy of that paper is attached). In general, the conclusion was that the level of competitiveness within an industry was related to the rate of innovation, within certain limits. A highly oligopolistic industry is one which tends to minimize the rate of innovation and a highly fractured or disaggregated industry also militates against innovation. In the former case, there is little incentive to innovate (except for a situation like Bell Telephone which is an exception). In the latter case, small firms don't have the resources to invest. We believe there to be a middle ground in which innovation prospers. But exactly what the optimum rate of concentration within an industry is, from the point of view of innovation, hasn't been analytically determined. Industry and government appear to agree that there is no inherent problem in current anti-trust laws. However, industry and government have not engaged in sufficient dialogue with each other to understand their respective concerns. The President has directed such a dialogue to take place. This will help to define the most appropriate action required to address any problems vis-a-vis innovation which may exist.

Question 11. How can we more effectively use Federally-supported R. & D. in small firms to promote commercially significant innovations?

Answer. Several of the President's industrial innovation initiatives will help promote commercially significant innovation by the use of federally supported R. & D. The Center for the Utilization of Federal Technology will provide access by small firms to the results of federally supported R. & D. In addition, the Administration's uniform Federal patent policy legislation would provide small businesses with title to inventions they make as a result of federally sponsored or supported R. & D.

Question 12. Have you seen evidence that indicates some private ideas for innovative technologies are lost at the R. & D. stage through government appropriation?

Answer. No hard evidence is known that supports the allegation that private ideas for innovative technologies submitted with unsolicited, or even solicited, proposals have been lost to the originator by government appropriation of the idea.

Question 13. Should small businesses be allowed to cooperate in developing compliance technologies to meet Federal regulations?

Answer. Cooperation in the development of compliance technology to meet Federal regulations may currently be permissible under the anti-trust laws. The President has asked the Department of Justice to clarify its position with regard to collaboration among firms in research and development.

Sincerely,

Attachments.[1]

JORDAN J. BARUCH.

[1] The attachments referred to have been placed in the committee files.

Senator STEVENSON. Mr. Brown?

Mr. BROWN. Thank you, Mr. Chairman.

I'd like to raise a couple of questions if I might: First, I feel that the recommendations made by the President in accordance with the report are uniformly constructive.

The criticisms, some of which you heard this morning, are likely to be that there is too little and it doesn't cover a broad enough area. I'm sure you'll be able to cope with these criticisms.

The initiatives that you suggested from the National Science Foundation, about which I'm most closely concerned, are laudable and build on existing successes within the Foundation.

My question to you is, however: Is there some way in which we can expedite the expansion of these programs? You are proposing to build upon initiatives that are to some degree in place.

You're suggesting an expansion of a modest nature, and the fiscal year 1981 budget is a year away. And if we proceed according to that schedule and funds come in a year from now, then the process of planning and other activities necessary to expand the programs will take another x months, and we're 1 or 2 years away from seeing the results.

Is there some way by which we can gain some time?

For example, where you are proposing an additional $20 million for university and industry cooperation, it's going to involve the planning or the allocation of the funds to the universities, to the industries, for the development of plans to be submitted and approved.

Can we do some of that in the current fiscal year? Could we spend, say, 10 percent of that $20 million to gain several months of time and to indicate our seriousness about it?

Dr. PRESS. It's an interesting proposal, Mr. Brown; let me think about it. Let me talk to the Director of NSF about that.

I would point out that this program has increased geometrically in the last 3 years. It doubled the first year, and it's going up another factor of two in the second year. At that rate of geometrical progression, it will exceed the gross national product if we don't stop it. So the increase is rather rapid for the program.

We did start small; we liked what we saw, and they are increasing it rather rapidly, perhaps as rapidly as the NSF can absorb it and personnel can handle it.

Nonetheless, your suggestion is an interesting one.

Mr. BROWN. Have I ever told you how big an oak tree would be if it grew as much in the second year as it did in the first year?

I wish you would examine the process.

Dr. PRESS. That's an arithmetic progression.

Mr. BROWN. I spent many hours with the NSF examining their programs, and I can tell you that today they can use constructively 10 times the amount of money they get; I'm not suggesting we give them 10 times the amount of money. I know what the overall budgetary restrictions are. But I am suggesting that if we are prepared to recognize the high priority of these programs, let's not delay another year and a half to get some action on the matter.

And I would make a summary observation with regard to your other studies; some of them in the information field, for example, where you're proposing constructive initiatives can be done relatively quickly by Presidential initiative. It doesn't require budget changes or new legislation, and I think that you can and will move in these areas. I commend you for it.

But I see this as an urgent national priority and one which requires more than a report which will be followed in a year and a half, we hope, by some action.

Now, unfortunately, that's the course of most Government initiatives, and you're not to be criticized too much for it. But I think the time has come to see if we can do better than that.

Let me ask one additional question having to do with the broad area of technology and its effect on the economy. I note in the briefing paper, the fact sheet that we have from the White House, the statement on page 3: "Unlike many foreign countries, the United States does not make major governmental investment in the development of technology."

Dr. Baruch made a somewhat similar statement—and I paraphrase it—when he referred to the private sector where industrial innovation takes place. Without quarreling with the basic thrust of these, let me ask you where the basic innovation took place in the following list of subjects: nuclear energy, solar energy, fusion energy, aeronautics, space sciences and instrumentation, space technology, including communications satellites, remote sensors, health sciences, agricultural sciences, radar; lasers, computers, and microelectronics?

Was there any Government funding in any of these?

Dr. BARUCH. Not only was there Government funding, Mr. Brown, but you point up the shortcoming of the statement in the fact sheet. The Government, of course, supports a great deal of certain research and development work. I would point out that the Government has rarely supported research and development work in areas other than where it is the primary purchaser.

Mr. BROWN. Yes, I would agree with that, but we seem to be getting into the position of being a primary purchaser in more and more areas. Now, my basic question is not to quarrel with the thrust of what you said. I happen to agree with it. But the point I want to make is this and to ask your comment on it: It has seemed to me that the problem is not Government funding of innovation, but there has been a failure to recognize the need to do this with a coherent plan for the full scope of activities leading to commercialization and an adequate spinoff of these technological developments into new industrial processes, which could benefit the country with the full participation of the private sector, small business, and so forth.

Is there anything in this program which addresses this sector—which you said doesn't exist—where the Government is involved and proposes to successfully make this transition to broad new commercial areas which can benefit the country on the whole?

Dr. BARUCH. We hope so; let me draw your attention, if I may, to the first example that I mentioned earlier. One of our problems in utilizing techno' es that grow out of the mission agencies' sup-

port for R. & D. is the narrowness of view that is necessarily imposed by the task at the mission agencies.

For example, we have an agency supporting new structural design technologies in airframes, it's highly likely that that will get successfully used and widely used in airframes; it is unlikely that it will be widely used in support of tunnels or in mobile homes.

One of the reasons that we want such a center is that we need a nexus that connects the wide spread of industry to the wide spread of industry technology going on.

That is one step; that relies on financial incentives, many of which are there, particularly for the smaller firms. It relies on the ability to relate that knowledge, and we have suggestions in here for that.

We have a wide spread of proposals rather than a few shots because the whole system needs shoring up in different sectors and in different kinds and sizes of business.

Dr. PRESS. Mr. Brown, I would like to clear up one point: You refer to that statement—what we meant is that unlike many foreign countries, the United States does not develop the technology to the point of introduction to the marketplace.

In other countries, intervention of the government goes much further than has been our policy in the past. We do make enormous investments in basic science and technologies that have marketplace potential, but we don't take that next step that countries like Japan and Germany do of providing that additional governmental funding.

Mr. BROWN. The change of the word "development" to "commercialization" would make a lot of difference in that statement.

Dr. PRESS. That was our intent in that sentence.

Mr. BROWN. One final question: There are a number of programs that you proposed before this domestic policy review was introduced. I presume the administration's position is that they don't need the legislation, that they can go ahead without it.

Dr. BARUCH. On some of the programs, Mr. Brown, the administration views that we have authority over many of the programs that would assume a different degree of importance if they were also supported by specific legislation.

Mr. BROWN. You don't want the Congress to be messing up your priorities by passing legislation; is that the idea?

Dr. BARUCH. No, sir; our job is to deal with the priorities establish by the Congress; that is, the job of the executive branch.

Mr. FUQUA. I hope the reporter got that answer down.

Mr. Erdahl?

Mr. ERDAHL. I have no questions. I appreciate the opportunity to be here today.

Mr. FUQUA. Senator Schmitt?

Senator SCHMITT. Thank you, Congressman. As I'm sure most members of this group are aware, Senator Stevenson and I and Senator Cannon have been very interested in patent policy, and Congressman Ertel and others on the House side are beginning the process of looking at that issue, too, in this Congress.

We in the Senate have completed 3 days of hearings on S. 1215, and I was happy to see in the President's release this morning that we agree on one thing. There needs to be a general, Government-

wide patent policy that recognizes the practical limitations of getting inventions and ideas that are developed under Government auspices out into the private sector, not only for use by consumers, but also for augmentation of the tax relief so that the taxpayer also benefits.

I hope in the next few weeks and months that we can come to some agreement on the nature of that uniform patent policy. We've had generally favorable testimony for the concepts of S. 1215.

We had some unfavorable testimony just the other day with respect to some of the problems, at least, that would come with exclusive license.

But I don't think those necessarily have to be bottlenecks to our working out an arrangement.

Dr. Baruch, do you see that there is room for discussion between the Congress—at least the committees of the Congress with jurisdiction in this area of patent policy and you?

Dr. BARUCH. I think there is need for it, and I look forward to working with you, Senator, to find a joint perception that is appropriate to both the administration and the Congress.

Senator SCHMITT. I appreciate that, and I'm sure Senator Stevenson does also. I think you and those that have been working on the problem feel that with the Government investing so much money in new research and technology, the denial of the fruits of that research and technology to anyone other than the Government is a mistake.

And it has contributed significantly to the problem of decline of innovation that brings us together today.

There is no question that in any theoretical world having unlimited licensing would seem to be the thing to do. We don't live in a theoretical world and it's just not happening. We have to find a middle ground, and I think your commitment to us to find that middle ground is important. We feel S. 1215 is that middle ground, but of course there is some disagreement on that.

Thank you, Mr. Chairman.

Senator STEVENSON. Thank you, sir.

I would like to follow up on what Congressman Brown was saying, first with a commendation of the administration and the President for this first step forward, a sound industrial policy for the United States; and I acknowledge that it is a first step and there is more to come.

With respect to taxes, our studies indicate a strong correlation between productivity, R. & D., innovation, and the general level of business investment. I don't see anything in here to encourage capital formation, business investment.

There are references to changes in the ERISA rules, but those are not new. What is the administration's response? Does it come with a proposal for changes in the tax laws or not at all?

Dr. PRESS. We agree that the facts of this study—that an examination of a tax policy will take place at the time of the President's overall tax proposals. The President said that this morning in his announcement, that when he does take up tax policy, he will consider the effect on innovation and productivity of the several possible tax proposals.

And so the absence of a tax proposal in this presentation today does not mean that they will not be considered; it simply means we will use another vehicle for that examination than this particular review.

That is why we say this is one of the first steps we will take.

Senator STEVENSON. But you are not saying that there will be that second step with respect to taxes; there may be.

Dr. PRESS. It will be examined from the point of view of innovation, yes.

Senator STEVENSON. So much for taxes.

Senator SCHMITT. Will the Chairman yield because I wish to associate myself with his remarks.

Senator WARNER. I would like to do the same; I think that's a glaring omission, Mr. Chairman, and I think it should be included. And I noted the memorandum which initiated this study was addressed to the Secretary of the Treasury. I came today thinking a representative of the Secretary would be here.

Senator STEVENSON. I thank you both.

Mr. Schmitt?

Senator SCHMITT. Just again to underscore that I and the chairman are very interested in patent policy; we're very interested in trade policy and all sorts of things that are inhibiting innovation and the development of markets and new products as well as existing products.

But for a report of this kind to defer the discussion of tax policies makes me very suspicious that it may not even be put forward at some future time.

You just can't talk about the problems of innovation in our society in any kind of comprehensive way without considering tax policy directly. And so in a sense, the study is still incomplete without that consideration.

Senator STEVENSON. In fairness to the administration, I did urge you to come up with whatever you could today, even if it did not include proposals with respect to taxes because we do want to get moving.

I think that should be on the record.

Now, moving beyond taxes, how much new money is in this proposal for fiscal 1981? I have a total figure of $55 million. Is that correct?

Dr. BARUCH. That's approximately correct, sir.

Dr. PRESS. There are some other things that are ongoing. Our proposal there is for $15 million in the industrial sector for the first year; I think that should be included as well.

But again I want to emphasize that the total of the new moneys underestimates the potential for those proposals that don't require funding but require new attitudes, that require legislation in the patent policy area that are likely to have as much impact on innovation as those that do require new funds.

Senator STEVENSON. Well, certainly money is only part of the answer. I note, however, that there is nothing in here for the Patent Office; the Patent Office requires money. But leave that aside for a moment. I wanted to raise a more philosophical question. I'm not convinced by anything that I've heard or seen in this country, including what I've heard this morning, that the executive

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branch or, Congress has the will to take the next step toward a national industrial policy.

The Japanese Ministry of Industry and Trade has just announced its recommended strategy for the 1980's. We don't even have a ministry of trade and technology. Among other things, that strategy recommends a fivefold increase in Government support for the commercialization of technology.

It identifies specific technologies for advancement including ocean mining, new material to replace the old; space; energy, of course; integrated circuits and computers.

Meanwhile, back in the United States, we're debating whether to bail out Chrysler, which just reported a loss of $460 million over the last quarter.

Now, Chrysler presents us with a choice. It's a good case in point. Are we going to the British route of succumbing to expediency, pressures, all the interests vested in the status quo, and subsidizing the low growth, geriatric industries, or are we going to subsidize our strengths, letting the market parcel out the pieces of Chrysler, while Government aids the survivors?

We don't have sufficient capacity for the manufacture of buses. Are we going to subsidize continued excess capacity for the production of automobiles or help develop and commercialize new technologies for industries of the future?

Or are we going to subsidize everybody? And if so, is this an appropriate ratio: $55 million in new money for innovation and $1.5 billion for Chrysler?

Which way do you gentlemen think we should go?

Dr. PRESS. Senator, we are not here to present the total administration's economic policy or industrial policy. For 25 years the question of innovation and Americans' ability to innovate has been a question that has been around; it's been studied to death. For the first time in a quarter of a century, the President of the United States has come in with a beginning proposal. That's the way he described it: definite action in nine different areas.

That has never happened before. I think this is an important statement. I think it should be treated that way.

With regard to the Japanese Government's intervention in Japanese industry, we all know what the Japanese Government is doing.

If you go to the American industrial leaders with this approach, they wouldn't touch it with a 10-foot pole—they wouldn't want the Government to intrude to that degree. We share your concerns about the health of the American economy. It's a very important issue.

But today we are here with a very special program, a beginning program, and a process we hope will go on in the future and will seem material to what we are trying to do.

Senator STEVENSON. Well, I do want to commend you for the first step, and I have already; and it does represent a new sensitivity on the part of the executive branch which I believe is unprecedented. It's very much to be commended. But there are two sides to this coin. It's a small first step.

The other side of the coin is: Do we continue down the British route, subsidizing all the failing, geriatric, low-growth industries, or do we begin to make some choices?

Just because industry may not like something doesn't tell me anything. It is our duty, and yours too, to represent the public, and what is good for Chrysler may not be good for the United States.

Will the administration support S. 1250, legislation to create innovation centers? That contemplates a whole new relationship among Government, industry, and the universities. And the reaction that I'm getting from industry is positive.

It may be that industry is a little bit ahead of any of us in the Government. It's on the line. It's getting beat up day in and day out; it's getting beat up by governments which support their industries, governments which cooperate with their industries, countries which recognize the difference between the two, government owned corporations in many instances.

And if industry does disagree, maybe it can be educated. That too is a function of its leaders.

How about S. 1250?

Dr. BARUCH. Mr. Chairman, I'm sure you'll notice some similarities to the proposal for generic technological development and S. 1250. I'm sure it doesn't come as a surprise to you. It is true that we as a country have to find new ways to compete in this developing economic order that you describe where we are competing against government owned corporations, Government subsidized corporations, and so forth.

I think we run the risk, however, if we act precipitously, of throwing the baby out with the bath water; we've had a very successful economic system here. It would be all too easy to create something in the shadow of the Japanese ministry without recognizing their ethnic homogeneity, and so forth.

I think it would be improper for us to do anything but to proceed along the course by taking small enough steps so that we can gather data, rather than taking a great big jump commiting ourselves to what we may find impossible later.

So I share your view that we do need to develop new means of dealing with this international order. I think this set of recommendations is part of that.

When the President said that this is a first step toward forging new relationships between the public and private sectors, he was looking to the same goals you are, but looking to do it in a way that is appropriate to the American tradition in which he has to do that.

Senator STEVENSON. The American tradition is excellent—individual ownership, Yankee ingenuity, innovation. I'm not suggesting we abandon that. But it's going to take more vigorous steps.

Senator SCHMITT. Will the chairman yield?

Senator STEVENSON. Yes.

Senator SCHMITT. And I may—I hope you agree because we worked together, as I said before, a long, long time on this, and your illustration of the Japanese situation, I don't think is put forward as a model to follow, necessarily but as the challenge.

And a different set of challenges come from Europe; a different set of challenges from the Soviet Union. There will be challenges

from all over the world and there are—what I think the chairman and I have been stressing is that we must stop taking small steps, many of which are backward, and begin to do those things that we all know are necessary to let our system work and let the strength of our system compete as it can and has before.

The tax question is a major part of that. S. 1250 is— can be a significant part of that. The revision of our patent policy can be a significant part of that. Those are not small steps. Those are very, very important steps, and there are others and we can take.

The system can work. Now, you say "Let's take small steps." But every once in awhile the administration proposes a giant step, such as the creation of a standard fuels corporation, which goes in the wrong direction.

It's a giant step backward in terms of our being able to compete industrially in the world markets. It probably will be if it becomes law—and I hope it doesn't—would sacrifice the energy production of this country for continued foreign imports.

But be that as it may, the chairman and I and others, I think, are just saying: Let's clearly do those things which will let the system work.

And, frankly, I'm not impressed with the President's proposals. It may be a step in a forward direction, but it ignores those things that the Congress for years—and the American system, in general—knows will work. And we ought to let it work.

Thank you, Mr. Chairman.

Senator STEVENSON. Thank you, sir.

Let me yield the gavel to Congressman Bedell.

Mr. BEDELL [presiding]. Thank you, Mr. Chairman.

Dr. Baruch, when Secretary Kreps gave her testimony on improving innovation plans in this country, she said you would give testimony regarding those plans.

She said the President's suggestions are based on a year and a half of intensive work with approximately 28 Federal agencies, 250 Government officials, and 500 representatives of business, labor, public interest, and the academic community involved in this effort.

Was this effort directed toward innovation?

Dr. BARUCH. Yes, sir.

Mr. BEDELL. And there were special meetings with regard to innovation and how it would be done?

Dr. BARUCH. Yes, sir.

Mr. BEDELL. Would you furnish me with the names of representatives of small business firms who were included among those 500 representatives that met with the President?

Dr. BARUCH. I'd be glad to.

Mr. BEDELL. Thank you very much.

[The following information was subsequently received for the record:]

The Department of Commerce sought the views of small business representatives during the Domestic Policy Review of Industrial Innovation. This response lists three categories of small business representatives who participated in the DPR:

I. Small businessmen.

II. Other representatives of the small business community, such as lawyers who represent small business in patent matters, and individuals who have directed firms during the transition period from small business to large.

III. Members of the Ad Hoc Committee of Small Business Members, whose deliberations were jointly sponsored by the Small Business Administration and the Department of Commerce.

Individuals from the first category, small businessmen, include:

Walter J. Borkowski, Contract Coordinator, Suntech, Inc.; Herbert R. Brinberg, President, Aspen Systems Corporation; Wayne H. Coloney, Chairman & C.E.O., Wayne H. Coloney Company; Joe Engelberger, President, Unimation, Inc.; Theodore J. Gordon, The Futures Group; John J. Hood, Agricultural Research Institute; Eugene M. Lang, President, REFAC Technology Development Corporation; George Lockwood, General Partner, Monterey Abalone Farms; Sheldon Miller, President, Tesco Engineering; Robert Nathan, Chairman, Robert Nathan Associates; Gerhard J. Neumaier, President & C.E.O., Ecology and Environment, Inc.; H. E. O'Kelley, President and C.E.O., Datapoint Corporation; Duane D. Pearsall, President, Small Business Development Corporation; Frank Piasecki, President, Piasecki Aircraft Company; Robert Springborn, President & C.E.O., Springborn Laboratories; John H. Stephens, President & C.E.O., Exel Minerals Company; Beno Steinlicht, Technical Director and Board Chairman, Mechanical Technology, Inc.; David E. Sunstein, Inventor; Glen Travis, Wentzway Corporation; Lawrence Welke, President, International Computer Programs.

Individuals for the second category include:

John L. Gray, Partner-Attorney, Emems, Hurd, Kegler, and Ritter; Leonard H. Harlan, Harlan, Betke and Myers; Charles Heiken, attorney; Richard Jenerette, Chairman, Donaldson Lufkim; Peter Johnson, President & C.E.O., Trus Joist; Lawrence I. Lerner, Attorney; Robert N. Noyce, Chairman, INTEL Company; Eric Schellin, Attorney.

Individuals from the third category:

George S. Lockwood, President, Monterey Abalone Farms; Wayne H. Coloney, Chairman & C.E.O., Wayne H. Coloney Company; Eugene M. Lang, President, REFAC Technological Development Corporation; Duane Pearsall, President, Small Business Development Corporation; Eric Schellin, Attorney; Robert C. Springborn, President & C.E.O., Springborn Laboratories.

Mr. BEDELL. Dr. Press, in your testimony you had a statement that read as follows:

In large firms, they frequently rely on the acquisition of small, innovative firms for the introduction of significant changes.

Such acquisitions benefit both parties, providing significant incentive to the entrepreneur and the small firms.

Would you explain what you meant by that statement?

Dr. PRESS. In many cases, the small, innovative firm, after it has demonstrated its innovation and the commercial potential of its innovation is acquired by a large company. And many large companies innovate by acquiring small firms. Procedures have been used in this country—this is a demonstration of innovation; that's what I meant.

Mr. BEDELL. Let me again read what you said:

In large firms, they frequently rely on acquisition of small, innovative firms for the introduction of significant changes.

Such acquisitions benefit both parties, providing significant incentive to the entrepreneur and the small firms.

It seems to me that you are saying that frequently small firms are acquired by larger firms, and that gives larger firms the opportunity to use that innovative process in their growth.

Is that correct?

Dr. PRESS. Yes, sir.

Mr. BEDELL. If I read further in your statement it says:

Approximately 50 percent of all innovation and nearly 100 percent of all radical innovations historically have come from small technologically based firms.

Moreover, 40 times as many jobs per dollar in sales are created by small, high technology firms as by larger firms in stable industries.

I presume you agree with that statement that you made. If that is the case and if that is what we're looking at, to try to increase innovation—and I guess you would agree we're trying to increase innovation—is that correct?

Dr. PRESS. Yes.

Mr. BEDELL. Well, if that is the case—if what we're saying is that frequently the smaller firms, which do most all the innovation in our society, are acquired by larger firms so that they are no longer small firms that can do that innovation, and you think it's good that that is happening, as I read it here, because it strengthens the marketplace—then I think we're asking the wrong questions here as we look at innovation.

If our innovation comes from small firms, which you clearly indicate that you think it does, and then if we have policies in which we say we're going to move those small firms out of the marketplace because we think it's good that larger firms acquire them, then I think we had better look at what our basic problem is.

We've had testimony with regard to patents. I would suggest to you that our patent laws drive small firms out of innovation and drive small firms out of business because our present patent laws, as they go through the courts, require so terribly much money to either defend the patent you own or to try to be able to show that you should be able to produce a product when somebody else charges you with infringement.

The small firms have no way in the world at all of being able to pay the fees involved today in order to do that to survive.

And I wouldn't be so disturbed, excepting that we see so clearly in the testimony that our innovation primarily comes from the small firms.

And then we have policies in which we say it's great that we eliminate them from the marketplace. And we say—we say that we should not be involved. We do not intrude in business.

I say we do intrude in business. I say when we have laws that simply say that the patent laws are such that small firms are out of luck, we are intruding in the marketplace. And how do we find out what is in the national interest? I don't think it is in the national interest. And I don't think even beyond that that most people want to see a society where small firms who innovate are absorbed by larger firms, and so our society moves toward more and more concentration in the society.

I don't criticize you for your statements. I think you're absolutely right. I think that is exactly what we have. But I do criticize anybody who doesn't look at it and ask the question: Is that really the direction we want our society to move in?

I, for one, do not want it to move that way. I, for one, want an opportunity for small business to innovate and to grow and to prosper as a result of that innovation. I don't want patent laws that prevent them from benefiting from that innovation.

I don't want policies in which it would be just fine for having them absorbed by large businesses if they are successful in innovation.

And I would hope we would at least look at that problem as we look at innovation.

Mr. Ertel?

Mr. ERTEL. Thank you.

Dr. Baruch, I've been interested for some time in the patent policy, as has Senator Schmitt. We have both introduced bills which are somewhat contrary to the policies initiated by the President in the statement which you have talked about here. I have some questions about that policy.

You indicate the President has decided to seek legislation which would give uniform patent policy, and then in the next statement you say the Government will grant exclusive licenses in fields of use if the Government chooses to give it, and only after the invention has actually been developed.

I'm not so sure that is uniform. We know that the title remains with the Government, and that's where the uniformity ends because when we start negotiating on an individual basis for every individual license, you have put a tremendous administrative workload on the bureaucracy. Our hearings have indicated that when people negotiate those exclusive licenses, it takes 10 to 16 months. There are certain agencies that do give us exclusive licenses, and the policy is today for Government retainment of title.

Now, it seems to me that that is a tremendous built-in delay to the policy that you're talking about; rather than transferring title to the contractor in the initial setup and the initial contract.

Do you have any comment on that? And maybe I'm not clear?

Dr. BARUCH. Yes, you're clear.

We recognize that when you start negotiating licenses, you cause administrative work; that is true in the private sector.

In our case, we have the public interest to serve in doing that, namely to increase the utilization of those patents.

We are trying to strike a ground that we see as possession—between total freedom of patent with predistribution, which is really not a patent at all, or total retention of the title by the contractors.

Now, it would seem a poor test of how to frame Government policy by saying it's going to take more work to do it this way. We recognize it's going to take more work; we're prepared to tackle that job, and we're prepared to do this in the best interest of the public.

Mr. ERTEL. You are prepared to tackle the job, Dr. Baruch, but the question becomes: Is it worth it? Is it worth it to the Government to spend that kind of time, that kind of energy, and on the other hand, is it worth it to the industry to have to spend that kind of time just in legalities.

You talk about a patent system that doesn't work, and I believe that, frankly. I've spent some time in the patent system and I don't think it does work to the advantage of the American public.

But it just seems to me at this point, when you're talking about uniform policy, and then you say that each time you're going to negotiate an exclusive contract, that there is nothing uniform about that at all.

All it says is that we're going to retain title and we're going to have special negotiations on each and every license.

What's uniform about that?

Dr. BARUCH. First of all, that's not what the President's statement says; what it says is that the contractor will be automatically granted an exclusive license for any fields of use he chooses to specify and agrees to commercialize. That's quite a difference from negotiation.

Mr. ERTEL. We're trying to move patents into the private sector for innovation and utilization. Under your proposed policy Government patents would be available to the inventors for exclusive use in one field. The Government would retain the basic patent and then go out and try to negotiate somewhere else for other uses.

That assumes that the public is going to know at that point that the Government has that patent and that they can utilize it in another field of use. That's the same thing we have now, and it isn't working.

I think that's evident, that 5 percent or 4 percent of Government patents are actually commercialized, whereas 20 percent in the private sector are commercialized.

So what you're saying is: We're going to give exclusive licenses for a very narrow field of use, and we're still going to retain the title. And we expect somehow for you to utilize that in some other business. That's happening now.

What's the change?

Dr. PRESS. I think you misunderstand the proposal.

Mr. ERTEL. I don't think I do.

Dr. PRESS. The proposal is that the contractor can expect to receive an exclusive license in whatever fields he wishes to develop that patent. All right?

And that will be the presumption of this proposal, that he can expect that; it's not a negotiation or anything like that. That will be his right, unless there are certain national issues that will require Government intervention because of national security interests or health interests or something like that.

But the ordinary expectation is that the contractor will receive exclusive licensing in whatever fields he wishes to commercialize that patent, and the Government will retain title rather than giving away Government property, which many Members of Congress would oppose.

Mr. ERTEL. Dr. Press, he may expect to get that, but there are going to be negotiations on the field of use and negotiations on the royalties and payback to the Federal Government.

There's going to be a long negotiating process with the Federal Government. I can't see anything other than that. We're trying to eliminate administrate——

Dr. BARUCH. I think what we ought to do is pursue the course suggested by Senator Schmitt earlier, where we work together to try and iron out the kinds of concerns you have and the kinds of concerns we have to insure that we get a bill that will do what has to be done; namely, increase the utilization of inventions made under Government-supported R. & D.

Mr. ERTEL. I'm very happy to work with you, and I'm sure Senator Schmitt is as well. But I think we come at it from a different philosophical base. I think philosophically we're somewhat at different ends of the pole, and Senator Schmitt can speak for himself. But I see him nodding his head, so I think he——

Senator SCHMITT. You're doing it very well.

Mr. ERTEL. Thank you, Senator.

I think we just come at it from different poles, without giving title to the contractor, and then maybe getting payback rights afterward.

Thank you.

Senator SCHMITT. If the gentleman will yield, I will just add that the testimony we have had over here—and I suspect it's been similar to some degree in the House hearings—indicates that there is very, very strong support from everybody but the Federal Government right now for the general kind of philosophical approach that you have described.

So I hope that we can get together and argue these points out and come to some realization that you're not going to solve anything if you basically end up in the same place you are now, even though you change the name of the policy.

Mr. ERTEL. I agree with you, Senator Schmitt. If you'll yield on that, if I might make one addendum, that is true. We've had almost uniform testimony from Federal contractors, but we've also had many Government agencies support that approach.

We have had some who have not. But the bulk that appeared before our committee was for the title to the contractor.

Senator SCHMITT. When I said the Federal Government, I should have said the White House——

Mr. ERTEL. I guess I agree with you on that.

Mr. BEDELL. Congressman Lundine.

Mr. LUNDINE. Thank you.

Gentlemen, I am deeply interested in the development of productivity policy for this Nation. I think it is crucial to reversing a lot of fundamental problems that are deeply distressing this country.

It is unfortunate that the tax incentive part of a program for innovation has to wait until another day, and I wish to associate myself with the remarks of Senator Stevenson and others on that point.

And I promise not to ask a question about it. But perhaps it would be useful to get your impressions at this point about what the purpose of any tax incentive might be.

The question specifically is: Are we lagging in R. & D. expenditure and is that a lag or a decline in industrial investment or for Government research moneys or both?

I had the opportunity to meet with a group of people from different perspectives at a productivity conference not long ago and with one of Dr. Baruch's predecessors, uninhibited by OMB clearances and all, Dr. Myron Tribus of MIT. He said he didn't think there was a lack of expenditure for research and development.

He felt that there was only a problem in the application of research, and that it would be a waste of tax money to come up with any kind of an incentive program to try to increase incrementally research and development funds.

I'd be very interested in your comment on that point, both of you.

Dr. BARUCH. One of the problems with remarks like that of Dr. Tribus is that they treat the industrial activity of the United States as a homogeneous mass. Clearly, there is an enormous amount of

R. & D. investment in the private sector: Computers, solid state electronics, integrated circuits, automatic controls, and so on.

Clearly, there is very low investment by the private sector in research in the areas of housing construction, pressed metals, compressed metals production, and so forth.

So when we start to ask: Is tax policy the appropriate way to stimulate that, we have to ask ourselves: Do you really want to stimulate across the board, or do you want to call your attention to sectors that require a boost?

And I guess my response to your question about tax policy is that I prefer to use a sharper instrument directly as possible for the purpose of stimulating specific things like R. & D.

The purpose of capital formation is a totally different question that is, by necessity, over a much broader section of the industry.

Mr. LUNDINE. So, in general, you would agree that to use tax policies to increase research and development expenditure would be to use a blunt instrument? Is that right?

Dr. BARUCH. Unless it's a sharp tax policy.

Dr. PRESS. Just because a person comes from MIT doesn't mean he's an oracle of wisdom.

That includes me. I have had a number of conversations with industrial leaders, and I can say that they are divided on whether an R. & D. tax credit is a useful policy for aiding innovation.

I think we've got to learn more about these tax proposals and how they spur innovation; we have to learn from foreign experience; we have to learn from domestic experience.

These are very important proposals, and we will be considering them when it comes time to propose tax policy changes.

Again, I would like to emphasize the fact that they were not in this report doesn't mean that we don't realize how significant this approach to innovation would be. It means that—and I think you have to understand this—that the President doesn't want to bring tax proposals piecemeal to Congress from different sectors as they may be requested.

He wants to come forward with a single and encompassing fiscal policy, and at that time this will be examined.

Mr. ERTEL. Thank you, Mr. Lundine. There is one question I forgot to ask. What legislative proposals can Congress expect to receive as a result of the domestic policy review report today? And when can we expect to receive them if we are going to get them?

Dr. PRESS. We are in the process of translating the President's decisions into Executive orders to agencies to follow through where they are charged with certain tasks and with legislative proposals which will be forthcoming.

The time scale would be over the next few weeks—2 months.

Mr. ERTEL. In other words on everything that requires legislation with the review, we should have the legislative proposals by December 16 or 17?

Dr. PRESS. Yes. That is what we intend to do.

Mr. ERTEL. Thank you.

Mr. BEDELL. Further questions?

Senator STEVENSON. Mr. Chairman, may I offer Senator Hatch's statement?

Mr. BEDELL. Without objection, it will be entered in the record.

[The statement follows:]

STATEMENT OF HON. ORRIN G. HATCH, U.S. SENATOR FROM UTAH

Mr. Chairman, I would like, first, to commend you and the chairmen of all the participating committees for these hearings. It is a great thing when the House and Senate, and the various committees involved with an issue, can put aside jurisdictional or territorial differences to think seriously about the issue at hand. I know that the planning and preparation for these hearings must have been overwhelming and I think the staff involved deserves our thanks as well.

We are faced in this country with declining productivity and innovation. We are also faced with recession and inflation at the same time—a condition a majority of economists said a decade ago could not happen. The question we need to resolve before we can pursue any realistic policy at the federal level is the relationship between these two problems. What came first? The chicken or the egg? Is the economy slipping due to our lack of inventiveness and productivity? Or, is our capacity to innovate the result of the economy? As a member of the Health and Scientific Research Subcommittee and the Technology Assessment Board, as well as the Small Business Committee, I have been looking at the issue of innovation from a number of perspectives. I have come to the conclusion that the U.S. science and technology is spurred by incentives offered by a strong economy. Weaknesses of inflation, excessive taxation, and over-regular discourage the risk-taking which is the life of research. In spite of our national disparagement of the profit motive, the hope for profit fuels the desire of business to take risks.

The small business community has a remarkable record for supporting innovation and research. Many of our most significant inventions in the last century were developed by small businesses. It was recently estimated that small business accounts for about half of all U.S. innovation even though it receives only 3½ percent of federal research funds. This success is especially admirable in view of the relative position of small business in our economy. American small businesses have long borne the brunt of our sagging economy. If they are given the incentives inherent in a healthy, free enterprise economy, the contribution of small business can help lead the United States out of this productivity decline.

I, like the other distinguished members of this panel, look forward to hearing the testimony being brought to these hearings and appreciate the opportunity to focus on the problem of innovation in this country. I think with the information we will gain from these hearings and exchange of ideas, we will be in a far better position to judge the merits and/or defects of the President's new proposals for boosting U.S. innovation.

Senator STEVENSON. I don't have any further questions. We will have, at least from the Senate side, some additional questions to provide to the witnesses. And beyond that, gentlemen, I think hearings always have a way of sounding a little more pretentious than they are.

I want to underscore what I said in the beginning. I do commend you and the administration, and I hope you take from this hearing a feeling of support.

All of us want to be supportive, and if there is any general complaint, it is that we want to do more and without delay.

So I hope we can conclude in that spirit.

And again I give you our thanks and our commendations to you, the President, and Secretary Kreps who have taken this first step.

Mr. BEDELL. Senator Schmitt, do you have anything further?

Senator SCHMITT. Only to make more or less the same comment that Senator Stevenson just made: We do want to do more. I think more can be done.

Let's hope that this is, in fact, a place to begin and move forward with the cooperation of the administration.

Mr. BEDELL. Thank you, Senator.

Representing the Small Business Committee here, I presume you are well aware that the segment of our industrial society that is

most affected by tight money policies is the small fish in the ocean rather than the big fish in the ocean.

There is not going to be any trouble for big business to get the money it needs, but there will be for smaller business.

If you're correct—if your testimony is correct, Dr. Press, that most innovation comes from small business, then I hope you recognize there is a problem with innovation. The current tight money policies may well be necessary. I'm not arguing that. But we've got to realize it is a great deterrent for the opportunity for that segment of our society which furnishes all the innovations to continue in existence.

If there are no further comments, the hearing will be adjourned.

[Whereupon, at 12:50 p.m., the hearing was adjourned.]

[The following information was subsequently received for the record:]

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WEDNESDAY, OCTOBER 31, 1979

October 31, 1979

Office of the White House Press Secretary

THE WHITE HOUSE

FACT SHEET

THE PRESIDENT'S INDUSTRIAL INNOVATION INITIATIVES

BACKGROUND

The President initiated a "Domestic Policy Review" in April 1978 to identify appropriate government actions in connection with innovation. The President asked the Secretary of Commerce to lead the Review. The charge given the Commerce Department was: "What actions should the Federal government take to encourage industrial innovation?" During the course of the Review members of the Administration consulted with hundreds of groups and individuals from industry, labor, academia, and public interest organizations. Suggestions embodied in task force reports were rendered by 150 of these people. Their recommendations have been reviewed and analyzed by the President. In essence, recommendations ultimately selected by the President are designed either to develop a missing resource or influence decisionmakers in the direction of innovatio

Other industrial countries, recognizing the importance of innovation, are extending their competitive advantage through industrial policies, programs, and institutional structures aimed at selected technologies. To respond to this challenge to our economy and the competitive position of U.S. industry, the review developed policy options intended to foster the Nation's competitive capability and entrepreneurial spirit for the decades ahead.

The initiatives announced today are considered by the President as first steps in meeting the Nation's commitment to innovation and the continuing challenge to maintain the technological strength of the American economy.

The President's actions provide a signal to the private sector that innovation is valued and that it is Federal policy to preserve and promote it in the years ahead. The Administration hopes this will improve the rate of innovation and will establish, over time, a climate in which it will flourish.

There are nine areas where the President has made specific decisions regarding innovation:

-- Enhancing the Transfer of Technical Information

-- Increasing Technical Information

-- Improving the Patent System

-- Clarifying Anti-trust Policy

-- Fostering the Development of Smaller Innovative Firms

-- Improving Federal Procurement

-- Improving Our Regulatory System

-- Facilitating Labor/Management Adjustment to Innovation

-- Maintaining a Supportive Attitude toward Innovation

ENHANCING THE TRANSFER OF INFORMATION

Scientific and technical information is created largely by universities, government laboratories, industrial laboratories and by similar activities abroad. It becomes the knowledge needed in industrial innovation when it is relevant to industry's problems or opportunities and when it is effectively transferred to the industry user. New actions deal with improving the transfer of existing, potentially relevant information; and improving the rate at which we create such information. To facilitate the transfer of existing information, the President is taking action in two areas.

1. The NTIS Center for Utilizing Federal Technology

The Federal government annually undertakes approximately $10 billion of R&D at Federal laboratories and Federally-funded R&D Centers. The National Technical Information Service (NTIS) provides a channel of communication with industry concerning these research results. It has a broad understanding of industry needs, and Federal laboratory activity. It is in position to help inform industries of technological opportunities of which they might otherwise be uninformed.

- The President has decided to enhance the NTIS program by creation of a Center in NTIS with the mission of improving the flow of knowledge from Federal laboratories and R&D Centers to industries outside the mission agencies' purview. The FY 1981 cost of the program will be $1.2 million and subsequent year costs will not exceed $2 million per year.

2. Foreign Technology Utilization

Foreign technological and scientific advances are an untapped source of technological information for American innovation. An inadequate ability exists within the Federal government and within industries to gather, analyze, organize, and disseminate information regarding foreign research and development activities that bear on the competitiveness of U.S. industry. Other countries gather such information on the U.S.

- The President has decided to have the NTIS include extensive foreign technical literature collection and translation in its present activities. This move will make relevant foreign literature available to industry. The first year program cost will be $1.8 million.

- The President intends to have the Departments of State and Commerce interview volunteer returning U.S. overseas visitors about observed foreign technological developments, collect reports from our science counselors, and collect photographs, and other unpublished information. This information will be merged with the NTIS data base on foreign technical literature to make it widely and easily available to industry. The 1981 cost of this program will be $2.4 million.

INCREASING TECHNICAL KNOWLEDGE

The Federal government supports a broad range of R&D activities from basic through applied research, development and demonstration in areas of interest to industry. Most of this work is to meet some specific social or national need, as in the case of future development or defense, or to provide a foundation for future advance, as in the case of basic research. Unlike many foreign countries the U.S. does not make major direct governmental investments in the development of technologies. The President will take actions in three areas aimed at enhancing the technical knowledge base in the United States.

1. Generic Technology Centers

The President believes there is a Federal role in the development of generic technologies -- that is, technologies that underlie industrial sectors. Examples include welding and joining, robotics (automated assembly), corrosion prevention and control, non-destructive testing and performance monitoring and tribology (science of lubricants). Because the benefit from advances in generic technology to any one firm (or even one industrial sector) may be small, there is less investment in the development of generic technologies than would be justified by the benefits that flow from these activities.

- o The President has decided to establish non-profit centers -- at universities or other private sector sites -- to develop and transfer generic technologies. Each of the centers will be targeted on a technology that is involved in the processes of several industrial sectors, and has the potential for significant technological upgrading. It would not supplant efforts in the private sector that are designed for specific product development.

  - -- Each center will be jointly financed by industry and government, with the government's share dropping to 20 percent or less of the center's cost in the fifth year.

  - -- Four centers will be established in FY 81 at a cost of $6-8 million. Three will be sponsored by the Department of Commerce and one by the National Science Foundation.

  - -- In future years, the size of the program will depend on the proposals received, and the experience gained from this initial effort.

2. Regulatory Technology Development

One major cause of the modification of industrial processes in recent years has been the obligation to assure compliance with environmental, health or safety regulation. Innovation is important in making these changes so that the new processes meet regulatory objectives at the least cost. Federal investment in the development of compliance technology already is substantial There are very large Federal expenditures on technologies for the clean burning of coal or to improve the safety of mines. But there are instances in which the affected sector is unable to perform the work or to assure speedier compliance than the market can provide.

- The President will ask the Office of Management and Budget, in the course of its crosscut of regulatory activities in developing the FY 81 budget, to examine closely the nature and extent of expenditures on compliance technology and to bolster the Federal effort.

3. Improved Industry-University Cooperation in R&D

The scientific and technological strength of American universities has not been harnessed effectively in promoting industrial technological advance. In order to achieve this end, in FY 1978 the NSF established a program for the support of high quality R&D projects that are proposed jointly by industry-university research teams.

- The President has decided to provide $20 million of new funds at NSF in FY 1981 for this purpose with subsequent year support at a similar level.

- In addition, the President plans to extend the NSF program to other agencies. NSF will work with DOD, DOE, EPA, and NASA in FY 1980 and with other agencies in subsequent years to initiate such university-industry cooperative R&D programs and to establish quality-control procedures as effective as the NSF peer review system. Each agency will formulate plans for building its support for this program with the objective of reaching an aggregate of $150 million.

STRENGTHENING THE PATENT SYSTEM

Patents serve several important functions in the innovation process. First, they provide an inventor with an incentive -- a monopoly limited in time. Second, the exclusive rights provided by a patent can stimulate a firm to make the often risky investment that is required to bring an invention to market. Finally, a patent provides an important method for disclosure of information about inventions and their uses to the public.

1. Uniform Government Patent Policy

The Policy Review identified strong arguments that the public should have an unrestricted right to use patents arising from Federal sponsorship. These patents were derived from public funds and all the public have an equitable claim to the fruits of their tax dollars. Moreover, exclusive rights establish a monopoly -- albeit one limited in time -- and this is an outcome not favored in our economy.

Several competing considerations, however, urge that exclusive rights to such patents should be available. First, government ownership with the offer of unrestricted public use has resulted in almost no commercial application of Federal inventions. Without exclusive rights, investors are unwilling to take the risk of developing a Federal invention and creating a market for it. Thus, ironically, free public right to use patents results, in practical terms, in a denial of the opportunity to use the invention. Second, many contractors, particularly those with strong background and experience with patents, are unwilling to undertake work leading to freely available patents because this would compromise their proprietary position. Thus, some of the most capable performers will not undertake the government work for which they are best suited.

As a result of the strength of these considerations, most agencies have the authority in some circumstances to provide exclusive rights. But because of the difficulty of balancing the competing considerations, this issue has been unsettled for over 30 years and the various agencies operate under different and contradictory statutory guidance. The uncertainty and lack of uniformity in policy has itself had a negative effect on the commercialization of technologies developed with Federal support. As a result, there is an active interest in the Congress and among the agencies to establish a clear and consistent policy.

The President considered a range of options, from always vesting title in the contractor, to maintaining the status quo. In arriving at his decision, the President considered the following factors:

-- Uniformity. The agencies are currently governed either by an array of different statutes or, in the absence of statute, by Presidential guidance. Indeed, some agencies have different statutory guidance on patents governing different programs. In light of this, there is substantial confusion among contractors who perform R&D for several agencies or programs.

-- Impact on Innovation. Exclusive rights to a patent may be necessary to ensure that a firm will make the often risky investment that is required to bring an invention into production and to develop a market for it. Exclusive rights provide protection from other firms that might skim the profit from the market by copying the invention after the risk and cost of introduction are reduced by the first firm's efforts.

-- Administrative Burden. Any policy that requires an agency to make decisions imposes some administrative costs.

-- Uncertainty. A clear and easy-to-apply rule is preferable to an ambiguous rule for the guidance it offers to both industry and government officials.

-- Contractor Participation in Government Programs. Firms with strong proprietary positions are unwilling to accept government contracts that would result in freely available patents.

-- Competition. Exclusive rights foreclose competition in the marketing of the invention covered by the patent and serve, in some cases, to enhance the recipient's market power.

o The President has decided to seek legislation that would establish a uniform government policy with exclusive licenses in the field of use. Title to the patent will be retained by the Government, but the contractor will obtain exclusive licenses in fields of use that he chooses to specify and in which he agrees to commercialize the invention. There will be an exception where the agency determines that such a license would be inconsistent with either the agency mission or the public interest. In most cases, the allocation would be after the invention has been identified, rather than at the time of contracting. The Government would license in all fields of use other than those claimed by the contractor. The Government would retain march-in rights that can be exercised in the event the licensee does

- The President also supports the retention of patent ownership by small businesses and universities, the prime thrust of legislation now in the Congress, in recognition of their special place in our society.

2. Other Reforms

The achievement of the objectives of the patent system depends in large part on the strength of protection a patent provides. Today a U.S. patent has less than a 50 percent chance of surviving a court challenge. Uncertainty as to the validity and continued reliability of a U.S. patent creates the threat of lengthy and expensive litigation with an uncertain outcome.

- To improve the presumptive validity of an issued patent, and to reduce the cost and frequency of defending it in court, the President is proposing several significant steps. First, the quality of issued patents will be significantly upgraded by major improvement of the Patent and Trademark Office's filing and classification system. Second, he is urging the Congress again to establish a single court to deal with patent appeals. This court would establish nationwide uniformity in patent law, make litigation results more predictable, and eliminate the expensive and time-consuming forum shopping that characterizes patent litigation. Finally, to minimize the cost and uncertainty of litigation patent validity in the courts, the President will submit legislation to provide for voluntary reexamination of issued patents by the Patent and Trademark Office at the request of any person or the court.

- One of the world's greatest stores of technical information is in the Patent and Trademark Office files, which include more than four million U.S. Patents. However, the current state of access to the information in these files renders their technical content inaccessible to anyone but patent examiners. The President is asking the Patent and Trademark Office to undertake efforts to provide greater ease of public access and use to these files. These reforms will be undertaken without an increase of public expenditures by adjusting the fee schedule of the patent office so that those who benefit will pay for the services they receive. Legislation supporting these reforms will be submitted to the Congress.

- The Administrator of the Small Business Administration will establish an Office of Small Business Patent Counsel to assist inventors in the transition from invention to small business by providing the ancillary business that attorneys rarely provide. To encourage the development of technologically-based minority businesses, a similar office will be established in the Office of Minority Business Enterprise and its activities will be coordinated with the SBA. All costs will be met by reprogramming.

CLARIFYING ANTI-TRUST POLICY

Anti-trust laws play a specific role in promoting innovation. Vigorous enforcement of anti-trust laws spurs competition -- and the pressure of competition is a stimulant to the development of innovations that provide a competitive edge. However, anti-trust laws are often and mistakenly understood to prevent cooperative activity, even in circumstances where it would foster innovation without harming competition.

The Domestic Policy Review revealed such misunderstanding in industry, universities, and government in instances where cooperative research is permissible, or where cooperation is not permissible.

- Industry underinvests in longer-term basic research, largely because the pay-back is difficult to achieve. In long-term research particularly, the President believes some industry cooperation is desirable. This premise led to the cooperative automotive research program, announced by the President and auto industry executives following their meeting at the White House in May 1979.

The President is taking two actions that will clarify anti-trust policy and should spur greater research activity by industry:

- The President is asking the Department of Justice to prepare a guide to clarify its position on collaboration among firms in research and development.

- The President is requesting the Attorney General, the Chairman of the Federal Trade Commission, and the Secretary of Commerce to initiate discussions with industry about innovation, anti-trust policy formulation, and enforcement. The purpose is to dispel the perception that anti-trust policy inhibits innovation and to improve communication between industry, the Justice Department and the Federal Trade Commission.

FOSTERING THE DEVELOPMENT OF SMALL INNOVATIVE FIRMS

Small, high-technology firms provide the majority of the new innovations in our economy. The major problems facing entrepreneurs in new firms have been identified as: start-up capital, second-round financing, and early management assistance. The new capital gains structure has loosened the flow of second-round venture capital from private sector sources.

In addition to other actions that generally will benefit smaller R&D firms, the President is taking four specific steps to foster innovation in small, high-technology firms:

1. National Science Foundation Small Business Innovation Research Program

The National Science Foundation Small Business Innovation Research Program provides funding to small companies to permit development of a venture analysis for new projects and demonstrate technological feasibility. The program has operated for two years at $2.5 million. It is applauded by both the small and big business communities. It has resulted in projects for which follow-on private-sector funding has been pledged.

- The President has decided to expand the NSF program through an increase in FY 1981 of $10 million. In addition, the President is directing the NSF to work with other agencies to determine whether similar programs should be established. The Office of Management and Budget will coordinate development of plans and goals for the expansion of these programs, working toward a goal of approximately $150 million annual funding.

2. Corporations for Innovation Development

States or multi-state regions can join in the Federal government's efforts to spur innovation by establishing State or regional "Corporations for Innovation Development" (CID's). The goal is to help alleviate some of the difficulty an entrepreneur confronts in obtaining start-up capital. These CID's would be modeled partly after the successful National Research and Development Corporation in Great Britain and existing state corporations, such as the Connecticut Product Development Corporation. Their functions would include:

-- Direct equity funding for the start-up of firms wishing to develop and bring to market a promising, but high-risk, innovation.

-- Guidance to potential applicants to the National Science Foundation Small Business Program, including serving as the second-round guarantor in appropriate cases.

-- Early management assistance to firms that are funded.

-- When otherwise qualified, acting as the recipient of Economic Development Assistance funds for the State or region.

o To lead the way for States or regions to establish CID's, the Federal government (through the Department of Commerce) will support two regional CID's in FY 1981. To provide breadth, one of these CID's will be in an industrial region, and the other in a less industrialized State or region. The Federal support will be in the form of loans of $4 million per center, on the condition that the region provide matching funds.

3. Federal Support for Small R&D Businesses

Funding for new R&D is a problem for small firms. The small business community correctly believes that given their number, and the significance of their role in the innovation process, they receive a disproportionately low percentage of Federal R&D dollars. To deal with this, the President is directing each agency that contracts for R&D services to:

o Develop policies ensuring that small businesses are not unfairly excluded from competition for contracts

o Publicize, through the SBA and the State or regional CID's, opportunities for bidding that are especially appropriate to small businesses.

o Report their progress toward increasing small business participation annually to OMB.

4. General Venture Capital Availability

As the number of new start-ups increases, the demand for second-round financing will increase. While the capital gains tax changes have increased the flow from taxable private sector investors, the flow will be further encouraged by the following actions the President is taking:

- The President is directing the Administrator of the Small Business Administration (SBA) to change Part 121.302(a) of the SBA regulations to permit Small Business Investment Companies (SBIC's) and private sector venture capital firms to co-invest in a small firm. The changes are subject to restrictions. There must be an identifiable independent entrepreneur in control of the firm. And there must not be a provision for acquisition by the private sector firm as part of its financing.

- The Administration already has changed the Employment Retirement Income Security Act (ERISA) regulations to make it permissible for fund managers to invest in small, innovative businesses. In addition, the President will request the Administrators of ERISA and the SBA to establish an interagency committee to examine what regulatory changes or other means are needed to stimulate investment in small and medium-endowment funds. This will foster further availability of venture capital.

OPENING FEDERAL PROCUREMENT TO INNOVATIONS

New technology plays a critical role in promoting innovation. In a free enterprise system, however, marketplace incentives are the crucial motivators. This fact bestows a special responsibility on the Federal government, because it is the Nation's largest single purchaser of goods and services.

In the past, the Department of Defense and the National Aeronautics and Space Administration have shown convincingly the impact that Federal purchasing power can have as a marketplace stimulus. A pilot program at the Department of Commerce -- known as the Experimental Technology Incentives Program -- has demonstrated that the government can use its purchasing power to spur innovation in areas other than major systems development and high technology. The President will take actions intended to extend this experience to all Federal purchasing.

- The President is directing the Administrator for Federal Procurement Policy in the Office of Management and Budget to introduce reforms in Federal procurement practices by establishing uniform procurement policies and regulations so as to remove barriers that inhibit the government from realizing benefits of industrial innovation. Special attention is to be given to the most innovative small and minority businesses.

  -- Heads of executive agencies and establishments are being asked to designate senior officials to expedite implementation of new reforms.

  -- Special attention is to be given to substituting performance specifications in place of design specifications, and, wherever feasible, selection will be on the basis of costs over the life of the item, rather than merely the initial purchase price.

- The President is asking the Administrator, General Services Administration, to expand the New Item Introductory Schedule to publicize, within the Federal government, the existence of new items. To accomplish this, GSA will take steps to inform the business community -- particularly small businesses -- of the New Item Introductory Schedule and of its benefits.

IMPROVING OUR REGULATORY SYSTEM

Government regulations often influence industrial innovation, stimulating it in some cases and discouraging it in others. For example, some regulations provide incentives for inventing totally new processes to meet regulatory requirements. Other regulations can cause industry decisionmakers to divert resources from exploratory R&D into defensive research aimed only at ensuring compliance with government regulations.

The Carter Administration has a record of being sensitive to the need for a balanced approach to regulations, independently of the Domestic Policy Review on innovation. Previous actions the President already has taken that will have a favorable impact on industrial innovation include:

-- Deregulation of airlines and other industries. The President expects the pressure of competition to trigger innovative new ways to cut costs and improve service.

-- In environmental, health and safety regulation, the Administration is emphasizing cost-impact analysis to take account of regulatory burdens on industry. The President has formed the Regulatory Analysis Review Group and sent to Congress last spring the Regulatory Reform Act to make regulations more efficient and effective.

-- Last month, OMB reported substantial progress in the implementation of Executive Order 12044, which sets goals for improving Federal regulatory practices.

-- The President created the Regulatory Council to provide better coordination between the regulatory agencies. The Council is made up of the heads of 35 regulatory agencies. The Council is working to reduce inconsistencies and duplications between regulations, eliminate delays, reduce paperwork and generally keep the cost of compliance down. The Council publishes the Calendar of Federal Regulations which contains information about major regulations under development. This is intended to reduce uncertainty about future regulations. All of these reforms show the Administration's continuing efforts to offset negative effects of regulation on societal objectives.

In addition to these actions already taken, the President is announcing today several decisions specifically in connection with improved innovation:

- The Administrator of EPA will review the agency's programs to determine what further opportunities exist to substitute performance standards for design or specification standards within statutory authority. Specification standards should only be used when they are clearly justified. Regulatory agencies will also be encouraged to explore the possibility of providing dual criteria for either performance and specification standards, thereby allowing individual firms to choose the mode best suited for them.

- In conjunction with their semiannual regulatory agenda, executive health, safety, and environmental regulatory agencies will prepare five-year forecasts of their priorities and concerns. Better knowledge of agency plans will allow industry to plan its research and development.

- The EPA Administrator will develop and publicize a clear implementation policy and set of criteria for the award of "innovation waivers." He will assess the need for further statutory authority.

- Federal executive agencies responsible for reviewing the safety and efficacy of products will develop and implement a system of priorities. Under these systems, the agencies will identify those products that are most innovative and/or have exceptional social benefits, and expedite their clearance reviews to the extent permitted by applicable statutes. These systems will affect the speed, but not the quality, of the agency's review.

- To expedite the introduction of new drugs marketed in foreign countries and to expedite the U.S. drug review process, the President is asking the Administrator of the Food and Drug Administration to take steps to assure that our drug clearance process benefits from the foreign experience.

FACILITATING LABOR/MANAGEMENT ADJUSTMENT TO TECHNICAL CHANGE

Labor plays an important role in industrial innovation. Perceptions by investors of labor attitudes toward innovation influence the investors' willingness to move ahead. Labor, on the other hand, recognizes the importance of innovation and technological change, realizing that innovations that improve productivity commonly increase the number of workers employed within an industry over the long term. Labor also understands that entirely new industries have been created through innovation. Nevertheless, individual innovations often are perceived as a threat to labor because shifting skill mixes result.

The key to successful adjustment is warning time. Thus, a labor-technology forecasting system, supported cooperatively by labor and management, could be very valuable. Its purpose would be to attempt to forecast technological change within specific industries and to assess the implications for labor of such change. These forecasts and assessments could provide the basis for retraining and other adjustment activities by industry and labor. Labor has been advocating this approach for twenty years. It is long overdue. Therefore:

- The President is directing the Secretary of Labor and the Secretary of Commerce to work jointly with labor and management to develop a national Labor/Technology Forecasting System. The President is requesting that they implement this new system in the context of ongoing labor-management activities, in conjunction with agencies responsible for adjustment assistance, and in cooperation with labor/management teams.

MAINTAINING A SUPPORTIVE CLIMATE FOR INNOVATION

The results of the Domestic Policy Review stressed the importance of a favorable climate in the U.S. receptive to new innovation and of perceived public attitudes toward innovation. Accordingly, the President plans three actions aimed at making a clear public commitment to ensure that innovation in this country thrives in the future.

- Recognizing that future enhancements in industrial innovation lie primarily in the management/engineering area, the President is asking the Commerce Department and the National Science Foundation to host a National Conference for Deans of Business and Engineering Schools to stimulate improved curriculum development in technology management and entrepreneurship.

- The President is establishing an award for technological innovation. The existence of this award will provide explicit encouragement to U.S. industry, symbolizing a national commitment to innovation. The awards will consist of a Presidential plaque given to companies in six areas: transportation, communication, health, agriculture and food, natural resources (including energy). The selection criteria will include both technical excellence and commercial impact. The Department of Commerce will be responsible for presenting the President with a list of nominees each year. The awards will be presented annually by the President's Science and Technology Advisor.

- The President is asking the Productivity Council to form a committee charged with monitoring innovation, developing policies to encourage it, assisting the agencies in implementing these policies, and pursuing the removal of legislative or administrative barriers to the innovation process.

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EMBARGOED FOR RELEASE
UNTIL AFTER THE BRIEFING
WEDNESDAY, OCTOBER 31, 1979

October 31, 1979

Office of the White House Press Secretary

THE WHITE HOUSE

TO THE CONGRESS OF THE UNITED STATES:

Industrial innovation -- the development and commercialization of new products and processes -- is an essential element of a strong and growing American economy. It helps ensure economic vitality, improved productivity, international competitiveness, job creation, and an improved quality of life for every American. Further, industrial innovation is necessary if we are to solve some of the Nation's most pressing problems -- reducing inflation, providing new energy supplies and better conserving existing supplies, ensuring adequate food for the world's population, protecting the environment and our natural resources, and improving health care.

Our Nation's history is filled with a rich tradition of industrial innovation. America has been the world leader in developing new products, new processes, and new technologies, and in ensuring their wide dissemination and use. We are still the world's leader. But our products are meeting growing competition from abroad. Many of the world's leading industrial countries are now attempting to develop a competitive advantage through the use of industrial innovation. This is a challenge we cannot afford to ignore any longer. To respond to this challenge, we must develop our own policies for fostering the Nation's competitive capability and entrepreneurial spirit in the decades ahead. This Message represents an important first step in that direction.

I am today announcing measures which will help ensure our country's continued role as the world leader in industrial innovation. These initiatives address nine critical areas:

- Enhancing the Transfer of Information
- Increasing Technical Knowledge
- Strengthening the Patent System
- Clarifying Anti-trust Policy
- Fostering the Development of Small Innovative Firms
- Opening Federal Procurement to Innovations
- Improving Our Regulatory System
- Facilitating Labor/Management Adjustment to Technical Change
- Maintaining a Supportive Climate for Innovation.

INITIATIVES

1. Enhancing the Transfer of Information. Often, the information that underlies a technological advance is not known to companies capable of commercially developing that advance. I am therefore taking several actions to ease and encourage the flow of technical knowledge and information. These actions include establishing the Center for the Utilization of Federal Technology at the National Technical Information Service to improve the transfer of knowledge from Federal laboratories; and, through the State and Commerce Departments, increasing the availability of technical information developed in foreign countries.

2. Increasing Technical Knowledge. We have already made significant efforts to assure an adequate investment in the basic research that will underlie future technical advances. This commitment is reflected in a 25 percent growth in funding during the first two years of my Administration. I am taking some additional steps that will increase Federal support for research and development:

First, I will establish a program to cooperate with industry in the advancement of generic technologies that underlie the operations of several industrial sectors. This activity will broaden the $50 million initiative I announced in May to further research in automotive research. Second, in order to help harness the scientific and technological strength of American universities, I have directed a significant enhancement in support of joint industry-university research proposals. This program will be modeled on a successful program at the National Science Foundation, and I have set a target of $150 million in Federal support for it.

3. Strengthening the Patent System. Patents can provide a vital incentive for innovation, but the patent process has become expensive, time-consuming, and unreliable. Each year, fewer patents are issued to Americans. At my direction, the Patent and Trademark Office will undertake a major effort to upgrade and modernize its processes, in order to restore the incentive to patent -- and ultimately develop -- inventions. I will also seek legislation to provide the Patent and Trademark Office with greater authority to re-examine patents already issued, thereby reducing the need for expensive, time-consuming litigation over the validity of a patent.

For over thirty years the Federal agencies supporting research and development in industry and universities have had conflicting policies governing the disposition of pertinent rights resulting from that work. This confusion has seriously inhibited the use of those patents in industry. To remove that confusion and encourage the use of those patents I will support uniform government patent legislation. That legislation will provide exclusive licenses to contractors in specific fields of use that they agree to commercialize and will permit the government to license firms in other fields. If the license fails to commercialize the inventories, the government will retain the right to recapture those rights. I will also support the retention of patent ownership by small businesses and universities, the prime thrust of legislation now in Congress, in recognition of their special place in our society.

4. Clarifying Anti-trust Policy. By spurring competition, anti-trust policies can provide a stimulant to the development of innovations. In some cases, however, such as in research, industrial cooperation may have clear social and economic benefits for the country. Unfortunately, our anti-trust laws are often mistakenly viewed as preventing all cooperative activity.

The Department of Justice, at my direction, will issue a guide clearly explaining its position on collaboration among firms in research, as part of a broader program of improved communication with industry by the Justice Department and the Federal Trade Commission. This statement will provide the first uniform anti-trust guidance to industrial firms in the area of cooperation in research.

5. Fostering the Development of Small Innovative Firms. Small innovative firms have historically played an important role in bringing new technologies into the marketplace. They are also an important source of new jobs. Although many of the initiatives in this Message will encourage such companies, I will also implement several initiatives focused particularly on small firms.

First, I propose the enhancement by $10 million of the Small Business Innovation Research Program of the National Science Foundation. This program supports creative, high-risk, potentially high-reward research performed by small business. Further, the National Science Foundation will assist other agencies in implementing similar programs, with total Federal support eventually reaching $150 million per year.

Second, in order to experiment with ways to ease the ability of small firms to obtain start-up capital, I will help establish two Corporations For Innovation Development to provide equity funding for firms that will develop and market promising high-risk innovations. These not-for-profit firms will be established with State or regional capital and the Federal government will provide each with matching loan funds up to $4 million.

6. Opening Federal Procurement to Innovations. The Federal government is the Nation's largest single purchaser of goods and services. Through its purchases, the Federal government can influence the rate at which innovative products enter the market.

For that reason, I am directing the Office of Federal Procurement Policy to introduce procurement policies and regulations that will remove barriers now inhibiting the government from purchasing innovative products. Special attention will be given to substituting performance for design specifications and, wherever feasible, selection will be on the basis of costs over the life of the item, rather than merely the initial purchase price.

7. Improving our Regulatory System. During my Administration, I have already taken a number of actions to help assure that regulation does not adversely affect innovation. Working with the Congress, I have moved successfully toward deregulation of airlines and other industries, and I expect the pressure of competition to trigger innovative new ways to cut costs and improve service. In environmental, health and safety regulation, I have emphasized the use of cost-impact analysis, where appropriate, to take account of the burdens on industry in the regulatory process. To provide better

coordination between the regulatory agencies, I have created the Regulatory Council, composed of the heads of 35 regulatory agencies. This Council is working to reduce inconsistencies and duplications among regulations, to eliminate needless rule-making delays, to reduce paperwork, and to minimize the cost of compliance.

I am today proposing additional steps to improve our regulatory system. First, the Administrator of EPA will intensify his efforts, wherever possible, to use performance standards in regulations, specifying only the required goal, rather than the means of achieving it. Second, all Executive Branch environmental, health and safety regulatory agencies will prepare a five-year forecast of their priorities and concerns. This information will give industry the time to develop compliance technology. Third, all administrators of Federal executive agencies responsible for clearance of new products will be directed to develop and implement an expedited process for projects having a strong innovative impact or exceptional social benefit, and to do so without jeopardizing the quality of the review process.

8. Facilitating Labor and Management Adjustment to Technical Change. Although innovation can increase the number of workers employed within an industry over the long term, or even create an entire new industry, individual innovations may occasionally cause workers to be displaced.

In order to assure adequate time for workers and management to adjust to changes caused by innovations, I am directing the Secretaries of Labor and Commerce to work jointly with labor and management to develop a Labor/Technology Forecasting System. The System would develop advance warning of industrial changes and permit timely adjustments.

9. Maintaining a Supportive Federal Climate. The initiatives announced in this Message are only the first steps in our efforts to ensure American technological strength. We must also develop and maintain a climate conducive to industrial innovation. The Federal government must take the lead in creating that climate. And the Federal government's efforts must be continuing ones. I am committed to these goals.

I am charging the National Productivity Council with the continuing tasks of monitoring innovation, developing policies to encourage innovation and assisting the Departments and agencies in implementing the policies announced today. I am also establishing a Presidential award for technological innovation to make clear to this Nation's inventors and entrepreneurs that we place the highest national value on their contributions.

Each of the initiatives I have just proposed supports an important component in the innovation process. In combination, these initiatives should make a major difference in our Nation's ability to develop and pursue industrial innovation. However, these incentives will not by themselves solve our current difficulties in encouraging needed innovation. In our economic system, industrial innovation is primarily the responsibility of the private sector. The manager of the firm must decide whether to develop and market innovative new products or whether to find and employ new ways of making existing products. Although the Federal government can establish a climate that encourages innovative activity, it is the private sector that finally determines whether innovation will take place.

In addition, the steps outlined in this Message must be viewed in the context of our current severe inflation problem. With costs rising at an abnormally high rate, managers naturally have a disincentive to spend the sums needed for adequate industrial innovation. I understand and fully appreciate that changing certain of our tax laws could provide additional incentives for investment in innovation. Indeed, my approval of adjustments in the capital gains tax in the Revenue Act of 1978 has alleviated some shortages of venture capital. Many of the suggested alterations of our tax system are intertwined with other economic challenges -- such as fighting inflation. While it might be possible to make changes in the tax code that would promote innovation, these changes should not be viewed in isolation from other aspects of our economy. I will therefore evaluate tax laws affecting industrial innovation at the time that I consider my fiscal policies for Fiscal Year 1981.

CONCLUSION

Innovation is a subtle and intricate process, covering that range of events from the inspiration of the inventor to the marketing strategy of the eventual producer. Although there are many places in the chain from invention to sale where we have found modification of Federal policy to be appropriate, there is no one place where the Federal government can take action and thereby ensure that industrial innovation will be increased. We have therefore chosen a range of initiatives, each of which we believe to be helpful. In aggregate, we expect them to have a significant impact. Nonetheless, they represent only an early skirmish in what must be a continuing battle to maintain the technological strength of the American economy. I pledge myself to this task and ask the Congress to join me in meeting our common challenge.

JIMMY CARTER

THE WHITE HOUSE,

October 31, 1979.

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