Small Business & Innovation

A Report of an SBA Office of Advocacy Task Force

Office of the Chief Counsel for Advocacy
U.S. Small Business Administration

May 1979

SMALL BUSINESS

AND

INNOVATION

". . . there is a lot that can be done to channel research and development funds to the small business entities of America. We've done an analysis that shows the Government gets a much better return on its investment with a small business with eagerness and growth as a major commitment, a tiny bureaucracy where the superb leadership is very close to the actual working conditions, than we do with an equal amount of research and development money put into very large corporations which might consider research and development projects as one of the tiny portions of its total commitment."

-President Jimmy Carter

"Anything that won't sell, I don't want to invent. Its sale is proof of utility, and utility is success."

-Thomas Alva Edison

Prepared by:

Office of the Chief Counsel
for Advocacy
U.S. Small Business Administration

FOREWORD

P.L. 94-305 charges the Chief Counsel for Advocacy with the responsibilities to: examine the role of small business in the American economy and the contribution which small business can make in . . . stimulating innovation (Section 202(1)); develop proposals for changes in policies and activities of any agency of the Federal Government which will better fulfill the purposes of the Small Business Act and communicate such proposals to the appropriate Federal agencies (Sec. 203(3)); and, recommend specific measures for creating an environment in which all businesses will have an opportunity to compete effectively and expand to their full potential, and to ascertain the common reasons, if any, for small business successes and failures (Sec. 202(9)).

The Chief Counsel is authorized to hold hearings with the approval of the SBA Administrator. From time to time, he may prepare and publish such reports as he deems appropriate to carry out the functions of his office.

Pursuant to this authority, and with the approval of the Administrator, Honorable A. Vernon Weaver, hearings were held on January 4th and 5th and February 22nd and 23rd of this year in Washington, D.C., on the subject of Innovation and Small Business. This report and the draft copy of the "Small Business Innovation Act" are the products of those hearings.

TABLE OF CONTENTS

INTRODUCTION

This is a report of an unusual consensus among three citizen study groups on a matter of national urgency. The three groups were named for similar, but slightly different purposes.

First, the Commerce Department named fourteen leading citizens to a "work group" on "Job Creation through the Success of Small, Innovative Businesses." (JC-WG, hereafter).

Second, as part of a Domestic Policy Review of industrial innovation the Commerce Department included six small business people on advisory subgroups. They filed joint views on small business in industrial innovation, in effect becoming an additional subgroup of the Review. (INN-SBTF, hereafter).

And finally, we named twenty executives of small science-based firms and seven venture capital managers to serve as a "task force" on how to strengthen innovative small businesses themselves.

What is remarkable is that these forty-seven citizen leaders whose backgrounds, skills and outlooks are richly diverse arrived at roughly the same set of conclusions. Whether their purpose was creating jobs, shoring-up our sagging industrial innovation rate or expanding small science-based business--where they dealt with the same Federal policies, they reflect substantial consensus.

"Consensus" here does not mean that the views of the three groups are identical or that they cover exactly the same ground. Nor does consensus mean that any individual member of any of the groups would necessarily put his own views in precisely the terms used in the group's report. Every member of each group does not necessarily subscribe to every recommendation, although, of course, by his signature each member concurs generally in the group's consensus.

All three groups seem generally to agree that:

1. The critical need is for an entrepreneurial environment far more favorable to innovation and risk-taking than we have had for the past ten years;

2. Primary reliance for innovation can and should be placed on the private sector;

3. The unsatisfactory environment for innovation and risk-taking results from the cumulative impact of a number of Federal policies;

4. Small business is the most underutilized participant in the Nation's innovation process;

5. There is a compelling national stake in closing the gap between small business' potential contribution to innovation and its present utilization;

6. General Federal policy changes, important as they are, will not help small business enough: the changes needed must be specifically targeted to it;

7. Two typical yet central deficiencies cited among many are: (a) inadequate Federal targeting of Federal R&D procurement to small business; and (b) inadequate incentive for converting Federal R&D results to market sector civil technology innovation.

8. To meet those deficiencies a gradual build up to a 10% set-aside for small business research and development procurement is recommended. That would almost triple small business' share in a few years. Transfer to the private sector would be further stimulated by using 1% to follow a model program developed by the National Science Foundation.

9. Those Federal policy changes necessary for creating a favorable environment are practicable and achievable in the near term.

The SBA Advocacy Task Force met for four days. It was the judgment of the group that documentation and argumentation in support of its viewpoint was generally

available. (It had before it the Report of the Commerce Work Group on Job Creation (Appendix II) and knew that the second report (Appendix I) was in preparation.) It therefore concluded that it could best spend its time concentrating on the content of a specific legislative proposal.

What follows then is the text of proposed legislation. It is cast in layman's language and is not in the Congressionally approved form. Its purpose is to reflect recommendations rather than actual statutory language. (Versions of two parts of it have already been introduced in the U.S. Senate: S. 3496 pending before the Senate Judiciary Committee and S. 1074 before the Senate Small Business Committee.) It is followed by a schematic comparison of the recommendations of all three groups. The full texts of the reports of the Commerce Work Group of Job Creation and the Commerce Innovation Small Business Task Force are attached as appendices.

To students of the innovation process many of the recommendations will have a familiar ring. They have figured in other citizen group studies extending from the Charpie Commerce Department report almost twelve years ago, to the SBA Casey report of two years ago.

These forty-seven men and women have given generously of their time and talents. They have done so in the hope that they can communicate to their country's leaders the sense of urgency which they feel about this subject. It is rare that a single general prescription--enhancing the environment for small business technology innovation--appears to contribute to so many high priority Federal goals: stabilizing inflation through new products and new processes; speeding the replacement of non-renewable energy and material resources; strengthening domestic producers' competitive ability and the balance of payments; enlarging the most job productive part of our economy; and enhancing our ability to control undesirable consequences of our industry.

If these forty-seven citizens are right--and we believe they are--our country will gain much or lose much, depending on how quickly it accepts the advice they have given it.

Milton D. Stewart
Chief Counsel for Advocacy
May 23, 1979

A Report of the SBA Advocacy Task Force:

"Small Business Innovation Act of 1979"

A Legislative Proposal

SECTION 1. PURPOSE: TO ESTABLISH a Federal program to bolster innovative small businesses by strengthening their role in Federally funded research and development and by fostering their formation and growth in the economy.

This Act may be cited as the "Small Business Innovation Act of 1979."

SECTION 2: FINDINGS: THE CONGRESS hereby finds that

1. Technological innovation is a most important contributor to job creation, increased productivity, competition and economic growth in the United States as well as a valuable counterforce to inflation and our balance of payments deficit;

2. Small business is a principal source of major innovations in the Nation when compared with large business, universities and government laboratories;

3. Yet the vast majority of Federally funded research and development is conducted in large business, in universities and in government laboratories with small business receiving less than four percent of these funds;

4. While private U.S. technology expenditures are highly concentrated with just six industries accounting for over 85 percent of all industrial research and development spending and just 31 companies, many of them multi-national, accounting for 60 percent of total U.S. R&D;

5. Moreover, the Internal Revenue Code, in its present form insufficiently supports the formation, growth and long-term independent operation of innovative small businesses; THEREFORE

6. It is in the national interest to strengthen the ability of small businesses to be innovative, to increase private sector commercialization of innovations derived from Federal research and development, to increase the proportion of Federal research and development expenditures which go to small firms, to assure small firms of the opportunity to compete for Federal research and development contracts and to stimulate technological innovation by all possible means.

SECTION 3: RESEARCH AND DEVELOPMENT PROCUREMENT SET-ASIDES FOR SMALL BUSINESS: EACH FEDERAL Department or Agency shall target an increase by set-aside for small business of prime research and development contracts of at least one percent (1%) per year of its total research and development budget, beginning in fiscal year 1980, from fiscal year 1979 levels, until small business is receiving a prime contract dollar volume equal to at least ten percent (10%) of that Department's or Agency's total research and development budget.

SECTION 4: SMALL BUSINESS INNOVATION RESEARCH PROGRAMS: EACH DEPARTMENT or Agency with a research and development budget of $100 million or more will initiate a small business innovation research competitive solicitation program modeled after the National Science Foundation's Small Business Innovation research program, but introducing their own topics, making their own solicitation, evaluations and awards, the latter from their own budget. Funding of this program will be at a level equal to at least one percent (1%) of each agency's research and development budget, starting in fiscal year 1980. Each agency program shall be designed to be a direct attempt to stimulate technological innovation in the private sector from Federally funded research and development in agency program objectives.

SECTION 5: PATENTS AND INVENTIONS: (a) SMALL BUSINESSES should be allowed to retain patent rights on inventions made under Federally-supported research according to the following provisions:

1. Each small business shall have a reasonable amount of time to elect to retain title to subject inventions. The Federal agency may retain title if the invention is made under a contract for operation of a government owned research or production facility, or in exceptional circumstances when it is determined that restriction or elimination of the right of the contractor to retain title to a subject invention would better promote the policy and objectives of this bill.

2. Whenever the funding agency determines that it should retain title to a subject invention a copy of this decision shall be sent to the Comptroller General. The Comptroller General will then review this decision and inform the head of the agency of his determination as to whether or not this retention of title is justified. The Comptroller General will also submit an annual report to the House and Senate Committees on the Judiciary on agency implementation of this bill.

3. Each funding agreement shall contain provisions to: (1) insure the right of the Federal Government to receive title to any subject invention not reported to it within a reasonable time; (2) insure the government's right to receive title to inventions when the inventor does not intend to file for patent rights; (3) guarantee that the agency shall have a nonexclusive, nontransferable paid-up license to use the invention; and (4) insure the right of the funding agency to require periodic reports on the utilization or efforts at obtaining utilization of the subject invention.

4. The Federal agency has the right to require the subject inventor of his assignee to grant additional licenses if the agency feels that sufficient steps are not being taken to achieve commercialization. Additional licensing may also be required to alleviate health and safety needs, or under provisions for public use as specified by Federal regulations.

5. If the patent holder receives $250,000 in after-tax profits from licensing any subject invention during a ten-year period, or receives in excess of $2,000,000 on the sale of products embodying or manufactured by a process employing the subject invention within the ten-year period, then the government shall be entitled to collect up to 50 percent (50%) of all net income above these figures until such time as the amount of government research money has been repaid.

6. Any title holder to a subject invention or his assignee shall not grant to any person the exclusive right to use or sell any subject invention in the United States unless that person agrees that any products embodying the subject invention or produced through its use shall be manufactured substantially within the U.S. unless this provision is waived by the funding agency.

7. Federal agencies are authorized to grant exclusive, partially exclusive, or non-exclusive licenses on government owned patents to achieve commercialization.

8. After public notification of the government patents available for licensing the agency will then require that potential licensees submit plans outlining how the invention will be developed and marketed. If the agency determines that the granting of an exclusive or partially exclusive license will not lessen competition it will give first preference in its licensing to qualified small businesses.

9. All contractors not covered under this proposal will continue to operate under the existing agency programs.

(b) The Patent Office shall develop a practical, effective and low-cost per use computer-based search and retrieval system for its own use and public access with particular concern for its usefulness to small business firms. The system shall include appropriate classifications for and require the submission of supplemental information to make accessing easier, more complete and to provide more information concerning a patent's use and potential application.

(c) The Patent Office and the Small Business Administration shall jointly and urgently conduct a study of the feasibility of devising a modified version of the patent law and regulations for use by small businesses, and individual inventors. The goal of such a modified version shall be to reduce the time and cost of securing and defending the patent rights of small businesses and individual inventors to reduce the present inequity resulting from the greater ability of large business to make effective use of the patent laws and regulations.

(d) The Patent Office shall conduct a study regarding the feasibility of initiating a compulsory licensing requirement for patents which are not being adequately exploited and shall report back its findings to the Congress within one year.

SECTION 6: REGULATIONS, POLICIES AND PROCEDURES. (a) Procurement: The Office of Federal Procurement Policy in cooperation with the Small Business Administration shall develop and issue a simplified set of regulations for research and development awards to small business designed from the users' point of view.

1. Cost-sharing requirements for research and development awards to small business shall be eliminated and negotiated fees shall be allowed on all such contracts;

2. No Federal agency or organizational unit within an agency shall exclude small business from a fair and equitable opportunity to compete on a merit basis on the same terms as other participants;

3. Every Federal agency shall seek unsolicited proposals from small business and shall give such proposals a fair and prompt review based upon their

merit, and small business should have equal opportunity to receive sole source awards;

4. Independent research and development (IR&D) and bid and proposal (B&P) costs of small business firms shall be considered as expenses for the fiscal year in which they occur instead of being averaged-back over the past two years;

5. The Departments of Defense and Energy and the National Aeronautics and Space Administration shall take additional steps to conduct regular break-out reviews of all proposed large scale systems contracts for research and development, and to seek means of making more of this effort available to small business.

6. All Federal agencies involved with research and development funding will develop, with the Small Business Administration, specific programs to inform their staffs and consultants of the need to provide a fair and equal opportunity to small women-owned and minority business firms to be considered for Federally funded research and development; and of the requirement to guide, counsel and assist small firms to strengthen their capability to compete and insure that they receive a fair share of all Federal research and development contracts as described in the Small Business Act. Evaluations of procurement personnel performance shall include appraisals of achievement and attitude in expanding small and minority business participation;

7. All Federal agencies have a responsibility to identify and study those problems of their procurement system that, in effect, discriminate against small business and a responsibility to make changes or eliminate these practices to the extent possible through administrative action.

(b) Regulatory Flexibility:

1. All Federal agencies which issue regulations affecting small business shall, insofar as practicable, issue them so as to relate regulatory burdens to the relative size of the firms regulated.

2. In cases where government regulations provide for an agency to make a decision involving a matter initiated by a small business within a certain time period and that decision is not forthcoming by said deadline, it shall be assumed with legal force that the decision is affirmative, i.e., that permission, if not denied within a specified period, is granted an extension, if not denied within a specified period, is approved.

3. Offerings of less than $2 million involving one hundred or less investors shall be exempt from SEC registration requirements.

SECTION 7: CAPITAL FORMATION AND INVESTMENT: (a) In recognition of the risks of small-scale research and development, the potential economic benefit of research and development and the potential importance of small science and technology based firms to the Nation, for any small business which maintains an average investment over three-years of three percent or, in a single year spends six percent of gross revenue in research and development as defined by GAAP over the relevant period:

1. Investors in such firms may defer paying the tax on gains on equity investments provided they are reinvested in another small business (which maintains the same three or six percent R&D investment rate within two years);

2. Gains from capital investment in such firms, if held for a minimum of five years, shall be taxed at half of whatever rate would be applied by the IRS without this provision.

3. Losses from investment in such firms may be carried forward for ten years instead of five years due to the length of time often required for research and development to result in profitable new products, processes or services;

4. The period of exercising stock options in such firms is extended from a maximum of five to a maximum of ten years;

5. Start-up losses from such firms which would otherwise be barred may flow through to individual funding investors for tax purposes under Section 1244 of the Internal Revenue Code.

6. The Qualified Stock Option Plan for key employees is restored for these firms.

7. The Department of Labor and the Internal Revenue Service should devise regulations jointly that encourage, stimulate and otherwise provide incentive for, and eliminate obstacles to, increasing significantly the amount of pension fund assets that are invested in small businesses so as to maximize their capacity to be innovative. The Internal Revenue Service also should establish regulations and reporting procedures that improve the ability of small businesses to retain money and thus enables them to cope better with cash flow pressures.

(b) For tax purposes, specialized equipment and instrumentation for research, development or testing may be written off at any time and specialized research, development or testing facilities may be depreciated over a minimum of five years by such small business firms;

(c) Small business concerns may establish and maintain a "Reserve for Research and Development" for tax purposes in profitable years to use in periods of business stress up to the level of ten percent of gross revenues of $1 million, to the extent that contributions to the reserve are equalled by at least that amount of expenditure in that year for research and development.

1. Contributions to the "Research and Development Reserve" shall be considered as income when removed from the reserve unless used for research and development purposes.

2. When a firm ceases to be a small business, it may utilize any existing reserve for the same purpose but may not replenish it;

3. If a small business is acquired by a large firm, any existing reserve shall be considered taxable income.

(d) Subchapter S companies should be allowed to include up to 100 investors and corporations should be allowed to be stockholders of Subchapter S companies.

SECTION 8: IMPROVING SMALL BUSINESS EXPORT PERFORMANCE: THE CREATION of Small Business Export Trade Corporations should be encouraged by a double deduction for these corporations of up to $100,000 of annual expenses associated with the exporting activities of each client, with a loss carryforward of ten years. In addition, small businesses should be allowed a double deduction of special expenses of serving export markets up to $100,000 annually. Also, export procedures for technical products should be simplified.

SECTION 9: GOVERNMENT COMPETITION WITH AND DUPLICATION OF SMALL BUSINESS ENTREPRENEURIAL ACTIVITY: FEDERAL AGENCIES should be prohibited from engaging in and supporting research and development projects that are competitive with or duplicatory of private sector technological developments, or in other ways might prevent the establishment by small business of exclusive technological or intellectual properties in a new area of non-defense technological advancement.

SECTION 10: DEFINITIONS: As used in this Act -

(a) The Term "Federal agency" means an "executive agency" as defined in 5USC and in the military departments as defined by 5 USC 102.

(b) The term "contract" means any contract, grant, or cooperative agreement entered into between any Federal agency or any organization of person for the performance of experiments, developmental or research work funded in whole or in part by the Federal government. Such term includes any assignment, substitution of parties, or subcontract of any type entered into for the performance of experimental, developmental, or research work under the contract.

(c) The term "invention" means any invention or discovery and includes any art, method, process, machine, manufacture, design or composition of matter, or any new and useful improvement thereof, or any variety of plant, which is or may be patentable or otherwise protectable under the laws of the United States.

(d) The term "small business" firm means a concern as defined by Section 2 of Public Law 85-536 (15USC 632) and implementing regulations of the Administrator of the Small Business Administration.

(e) The term "research and development" when considered for tax purposes, means any activity defined as "research and development" according to Generally Accepted Accounting Principles.

(f) The term "research and development" when considered for Federal budget purposes, i.e., "research and development expenditures", means any activity defined as "research and development" according to the National Science Foundation.

COMPARISON TABLE

SBA ADVOCACY
TASK FORCE BILL

COMMERCE JOB CREATION
WORK GROUP (JC-WG)

COMMERCE INNOVATION
SMALL BUSINESS TASK FORCE (INN-SBTF)

TAX RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 7(a)(2)	We recommend that the capital gains tax rate be reduced to 25 percent (the pre-1969 rate) on the capital gains realized from the sales of stock of small businesses (less than 500 employees at date of purchase) whenever such stocks have been held for more than three years, with a rate of 10 percent for the capital gains of investors in the smallest businesses (less than 100 employees at date of purchase). The reduced rates would not apply to capital gains realized from the sale of real estate. (JC-WG) Reduce the federal tax on gains from capital investments in small science and technology firms to a level of fifty percent of the otherwise applicable capital gains rate, if the investment is held for a minimum of five years. (INN-SBTF)
Section 7(a)(2)	We recommend deferral of capital gains taxes on the sales of stock if the proceeds are reinvested within one year in small businesses, except those whose principal activities are real estate transactions. (JC-WG) Allow investors in small science and technology based firms to defer paying capital gains taxes on equity investments, provided the gains are reinvested in other small science and technology based firms within two years. (INN-SBTF)
Section 7(a)(3)	We recommend that the threshold for application of the full corporate tax rate of 46% be raised for small businesses from $100,000 to $200,000 of annual net income; and for annual net income below $200,000 a progressive rate schedule beginning at 10% on the first $50,000, and increasing in 10% increments to $200,000 on each additional $50,000. In addition we recommend that the carry-forward provisions for start-up losses of small businesses be extended from five to ten years. (JC-WG)

TAX RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 7(a)(3) (cont'd)	Allow small science and technology firms to carry forward losses for a period of ten years instead of five years. (INN-SBTF)
Section 7(a)(6)	We recommend restoration of the Qualified Stock Option Plan for Key Employees of small businesses. (JC-WG) Restore the Qualified Stock Option Plan for Key Employees in small science and technology firms, and establish the period for exercising stock options at ten years. (INN-SBTF)
Section 8	We recommend that the creation of Small Business Export Trade Corporations be encouraged by a double deduction for these corporations of up to $100,000 of annual expenses associated with the exporting activities of each client, with a loss carry-forward of ten years. In addition, we recommend that small businesses be allowed a double deduction of special expenses of serving export markets up to $100,000 annually. (JC-WG) Permit small businesses to take double deductions of expenses directly related to export market development. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	We recommend that small businesses be allowed to deduct twice their payments for regulatory advisory services related to compliance with federal, state, and local regulation. (JC-WG)
No parallel section in Advocacy Task	Provide for a twenty-five percent tax credit for research and development related expenditures by small businesses (as currently allowed in Canada). (INN-SBTF)

TAX RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
No parallel section in Advocacy Task Force Bill	Revise the corporate income tax rate to provide greater retention of earnings during the initial start-up and growth phases for small science and technology firms. (INN-SBTF)
Section 7(d), Section 7(a)(5), and Section 7(b)	A new class of equity security be created for start-up innovative businesses that would couple the benefits of limited partnerships with the benefits of Sub-chapter "S" Corporations. This new equity class would possess the following features: -- limited liability protection, -- include up to one hundred investors, -- allow incorporated investors, -- allow the use of cash basis accounting for tax determinations, -- allow operating losses and investment tax credits to flow through to individual funding investors in the year occurred, -- allow specialized equipment and instrumentation for research, development or testing to be expensed in the year purchased. This new class of stock and its benefits should be available to small businesses that spend in excess of five percent of their gross sales revenues and development as determined by Generally Accepted Accounting Principals.(GAAP) (INN-SBTF) (Note: As referred to hereinafter INN-SBTF Recommendation 1)

TAX RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
No parallel section in Advocacy Task Force Bill	Treat license royalties as capital gains instead of ordinary income. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	Eliminate the existing tax liabilities for overseas joint ventures in which the small business investment consists of a contribution of know how and technical information. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	We recommend that private sector individual or corporate owners of technology be rewarded, through appropriate changes in the tax code, for selling, leasing, or licensing their technology to small business firms in the United States. In addition, we recommend the establishment of a voluntary national policy to encourage companies to make their technologies available for uses by others. (JC-WG)
COLUMN NOTE: These two sections of Task Force Bill have no direct paralles in JC-WG or INN-SBTF Reports.	For tax purposes, specialized equipment and instrumentation for research, development or testing may be written off at any time and specialized research, development or testing facilities may be depreciated over a minimum of five years by such small business firms. (ADVOCACY TASK FORCE BILL - Section 7b) The period of exercising stock options in small business science and technology based firms is extended from a maximum of five to a maximum of ten years. (ADVOCACY TASK FORCE BILL - Section 7(a)(5))

RESEARCH AND DEVELOPMENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 3	We recommend that each federal agency receiving R&D funds by appropriation from the Congress be required to allocate at least 10 percent of all such funds (excluding those for basic research) to small businesses and that this objective be achieved in annual one percent increments beginning in FY 1980. (JC-WG) Each federal agency should be directed to allocate at least ten percent of its R&D budgets to small business and increase current levels by one percent of its budget each year until the ten percent minimum is established, starting in 1980. (INN-SBTF) This increase should be heavily directed towards basic research at universities and applied research and development in the private sector, with strong incentives for commercialization. (INN-SBTF)
Section 7(c)	We recommend that small business firms be allowed to establish and maintain a reserve for R&D for use in times of financial stress. (JC-WG) Allow small business concerns to establish and retain a "reserve for research and development in profitable years to be used in periods of business stress, with the maximum level of this reserve being ten percent of gross revenues. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	We recommend that each federal agency allocate five percent of its R&D funds for technology transfer. These funds should be used to establish well defined and organized programs of technology transfer in which there are incentives to individual researchers to contribute their time and skills to the identification of commercial applications. Such incentives should be related to the benefits realized from technology transfer. (JC-WG)

RESEARCH AND DEVELOPMENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
No parallel section in Advocacy Task Force Bill	The decline in R&D expenditures as a percentage of Gross National Product must be arrested and redirected upwards towards the goal of three precent by 1985. (INN-SBTF)
Section 4	Each year, starting in 1980, each agency with a budget of over $100 million for R&D should allocate at least one percent of its R&D budget to the small business program using the same format as that of the National Science Foundation but with their own research topics, and review and awards procedures. This program should be coordinated by an Inter-Agency Small Business R&D Committee chaired by the Small Business Administration. (INN-SBTF) We recommend that private sector individual or corporate owners of technology be rewarded, through appropriate changes in the tax code, for selling, leasing, or licensing their technology to small business firms in the United States. In addition, we recommend the establishment of a voluntary national policy to encourage companies to make their technologies available for noncompetitive uses by others. . . . . . The Work Group believes the National Science Foundation's program called "Small Business Innovation Applied to National Needs" has great potential for increasing technological innovation in the private sector and is worthy of emulation or even adoption by other federal agencies.. (JC-WG)

RESEARCH AND DEVELOPMENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 9	A clear federal policy should be established and enforced to prohibit federal funds from being used to finance projects that are competitive with or duplicatory of private sector technological developments, or in any other ways might prevent the establishment by small business of exclusive technological or intellectual properties in new areas of non-defense technological advancement. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	There should be decreased emphasis on applied research in universities, federal laboratories and non-profit institutions, particularly where such applied work might pre-empt private initiative or is duplicatory or competitive with private sector activities. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	We recommend that private sector individual or corporate owners of technology be rewarded, through appropriate changes in the tax code, for selling, leasing or licensing their technology to small business firms in the United States. In addition, we recommend the establishment of a voluntary national policy to encourage companies to make their technologies available for uses by others. (JC-WG)
No parallel section in Advocacy Task Force Bill	We recommend that there be some re-direction of federally-supported agricultural research to the development of technology for improving the efficiency of small family farms and food processors and for making food production, transportation, and preservation less capital and fossil-fuel intensive. (JC-WG)
Section 7(a)(5) Depreciation Allowance	Provide for a twenty-five percent tax credit for research and development related expenditures by small businesses (as currently allowed in Canada). (INN-SBTF)

REGULATORY PROCEDURES

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
No parallel section in Advocacy Task Force Bill	A thorough revision of the regulations and operating procedures of OSHA as they relate to small innovative business to include: -- A general exemption from OSHA, except where the accident history of a particular industry or firm is substantially greater than average, and in such cases, the burden should be upon OSHA to justify action; and -- The prohibition of first instance citations except in extreme cases. (INN-SBTF)
Section 6(b)1	In all regulatory activities, the burden should be placed upon each regulatory agency to establish a cause of concern before requiring regulatory compliance by a small business. Minimum levels of impact should be statutorily defined thereby exempting small businesses in all but extreme and justifiable cases. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	Substantial strengthening of the Regulatory Council to include: -- participation by the Small Business Administration; -- requiring all regulatory agencies to balance the risks of a hazard against the economic costs, with thorough consideration of specific impacts of proposed regulations upon small business creative processes; -- the use of "performance standards" and not "method standards" in those cases where regulatory standards are clearly justified; (JC-WG)

REGULATORY PROCEDURES

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
No parallel section in Advocacy Task Force Bill (cont'd)	-- wherever possible, return to reliance upon standards associations with federally mandated standards being the last resort, and -- improved congressional oversight of the regulatory process as it relates to small innovative businesses. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	Provide product liability and recall insurance at reasonable costs for small businesses, with exemptions from recalls except in the most extreme cases; and the establishment of statutory limits of liability for product failures similar to Workman's Compensation Insurance. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	We recommend that small businesses be allowed to deduct twice their payments for regulatory advisory services related to compliance with federal, state, and local regulation. (INN-SBTF)
COLUMN NOTE: These two sections of Task Force Bill have no direct paralles in JC-WG or INN-SBTF Reports.	All federal agencies which issue regulations affecting small business shall, insofar as practicable, issue them so as to relate regulatory burdens to the relative size of the firms regulated. (ADVOCACY TASK FORCE BILL - Section 6(b)) In cases where government regulations provide for an agency to make a decision involving a matter initiated by a small business within a certain time period and that decision is not forthcoming by said deadline, it shall be assumed with legal force that the decision is affirmative i.e., that permission, if not denied within a specified period, is granted and an extension, if not denied within a specified period, is approved. (ADVOCACY TASK FORCE BILL - Section 6(b)(2))

CAPITAL AND INVESTMENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 6(a)7	Modify ERISA to allow up to five percent of pension fund portfolios to be invested in small businesses. (INN-SBTF) We recommend (1) that ERISA's prudent man standard be restated so that it is clearly applicable to the total portfolio of pension fund investments rather than individual investments, and (2) that pension fund managers explicitly be permitted to invest up to five percent of pension fund assets in small firms. (JC-WG)
No parallel section in Advocacy Task Force Bill	Encourage state investment pools to invest a larger percentage of their holdings in small innovative businesses. (INN-SBTF)
Section 6(b)3	Exempt from SEC registration offerings of equity securities for innovative businesses outlined in Recommendation #1 of less than two million dollars. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	Change the charter of the Securities and Exchange Commission to specify the encouragement of the flow of capital into small innovative enterprises as well as to protect the public investor. (INN-SBTF)

PROCUREMENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 6 (a) 1	Cost sharing requirements for research and development awards for small business shall be eliminated and negotiated fees shall be allowed on all contracts. (INN - SBTF)
Section 6 (a) (2)	No federal agency shall exclude small business from a fair and equitable opportunity to compete on a merit basis on the same terms as other participants. (INN - SBTF)
Section 6 (a) 4	No agency shall restrict opportunities for small businesses to submit unsolicited proposals and shall give such proposals a fair review based upon their merit. Each agency shall provide small firms opportunities to receive sole source awards. (INN - SBTF)
No parallel section in Advocacy Task Force Bill	A separate set of simplified Federal Acquisition Regulations should be developed to apply to small business firms. (INN - SBTF)
No parallel section in Advocacy Task Force Bill	All proposals submitted by small business must be awarded or declined within four months of submission. (INN - SBTF)
No parallel section in Advocacy Task Force Bill	Proposal evaluations shall consider total costs relative to the work proposed, and not consider overhead or indirect cost rates due to variations in institutional and company accounting practices. (INN - SBTF)
No parallel section in Advocacy Task Force Bill	Fee negotiations shall take into consideration the level of interest rates and shall be higher in times of high interest rates than in times of low interest rates. All debt service costs shall be allowable costs for small business and procedures should be instituted for prompt payments to small businesses, with late payment penalties. (INN - SBTF)

PROCUREMENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 6 (a) 7	Every federal agency should study policies and procedures that discriminate against small businesses, and to institute changes that will equalize opportunity without harming the public interest. (INN - STBF)
COLUMN NOTE: These two sections of Task Force Bill have no direct parallels in JC - WG or INN - SBTF Reports.	The Departments of Defense and Energy and the National Aeronautics and Space Administration shall take additional steps to conduct regular break-out reviews of all proposed large scale systems contracts for research and development. and to seek means of making more of this effort available to small business. (ADVOCACY TASK FORCE BILL - Section 6 (a) (5)) All Federal agencies involved with research and development funding will develop, with the Small Business Administration, specific programs to inform their staffs and consultants of the need to provide a fair and equal opportunity to small women-owned and minority business firms to be considered for Federally funded research and development; and of the requirement to guide, counsel, and assist small firms to strengthen their capability to compete and insure that they receive a fair share of all Federal research and development contracts as described in the Small Business Act. Evaluations of procurement personnel performance shall include appraisals of achievement and attitude in expanding small and minority business participation. (ADVOCACY TASK FORCE BILL Section 6 (a) (6))

PATENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 5 (b)	The Patent and Trademark Office should develop a practical and effective computer based search and retrieval system for its own use and public access, with particular concern for its usefulness for small business firms. (INN - SBTF)
Section 5 (c)	A new mandatory re-examination procedure should be instituted in the Patent and Trademark Office whereby a litigant who raises a defense of invalidity of a patent based on new found heretofore unconsidered art should first test the assertion of invalidity in the patent office where the most expert opinions exist at a much reduced costs. (INN - SBTF)
No parallel section in Advocacy Task Force Bill	The budget of the patent office should be increased sufficiently to allow for more thorough searching of prior art using the most modern search technology. (INN - SBTF)
Section 5 (c)	The patent laws should be amended to recognize that the reliability of patents is a keystone in the commitment of funds to carry out commercialization of patented inventions, and incontestibility should be mandated after a period of time so as to result in absolute reliability, except in cases of fraud.(INN - SBTF)
Section 5 (a)(1)(9)	Legislation should be passed to give small businesses title to inventions made under government contracts, with the provision that commercialization be undertaken in a reasonable time. If such commercialization is not undertaken title should revert to the government and the government should license small businesses. As an alternative, small business should be able to obtain title to inventions developed under government awards if they invest an amount of capital at least

PATENT RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
Section 5(a)(1)-(9) (cont'd)	equal to the amount of the R&D award under which the invention occurred. Likewise, with inventions made in national laboratories, the government should preferentially license small business concerns. (INN-SBTF)
Section 5(d)	Small businesses should be able to obtain (with appropriate restrictions) compulsory licenses through suitable proceedings in cases where uncommercialized patents block entry into new markets. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	The Justice Department should be required to undertake competitive impact studies for taking anti-trust action against small business when a small business is attempting to exploit the full property rights afforded by its patent. (INN-SBTF)
No parallel section in Advocacy Task Force Bill	Treat license royalties as capital gains instead of ordinary income. (INN-SBTF)

EXPORT AND TRADE RECOMMENDATIONS

ADVOCACY TASK FORCE BILL SECTION	JC-WG AND/OR INN-SBTF RECOMMENDATIONS
No parallel section in Advocacy Task Force Bill	Eliminate the existing tax liabilities for overseas joint ventures in which the small business investment consists of a contribution of know how and technical information. (INN-SBTF)
Section 8	We recommend that the creation of Small Business Export Trade Corporations be encouraged by a double deduction for these corporations of up to $100,000 of annual expenses associated with the exporting activities of each client, with a loss carry-forward of ten years. In addition, we recommend that small businesses be allowed a double deduction of special expenses of serving export markets up to $100,000 annually. (JC-WG) Permit small businesses to take double deductions of expenses directly related to export market development. (INN-SBTF)

DISSENTING OPINIONS

As noted earlier, the SBA Advocacy Task Force Bill is the product of a nearly unanimous consensus of opinion. However, some individual members of the Task Force did express reservations about various sections of the bill. The following are excerpts from their comments on the bill.

"Section 9 (Government Competition with and Duplication of Small Business Entrepreneurial Activity) is rather broad. Conceivably, a venture could be privately funded on the west coast, and unbeknownst to either the government or west coast venture, there might be an east coast university project being funded by the government with the aim of solving the same problem. Furthermore, the relative success for either project might be uncertain, and the two efforts may be using different technological approaches. In this instance, I would not be in favor of automatically forcing termination of the government sponsored research."

"I do feel strongly that the tax provisions are too complicated and in some cases conflicting. . . . I would prefer to see us go for something fairly simple such as (1) restoration of the stock option, and (2) relief in the area of graduated corporate taxes for the benefit of small businesses."

"It is my feeling that far too much emphasis has been placed on technical aspects of patent reform and special small business concessions. In my view, this area is a quagmire which could swallow the rest of the legislation, while adoption of these provisions is (at best) of secondary importance."

"Section 5(a)(5) seems to me to be unwieldy, virtually impossible to administer, and an accounting nightmare. I suggest that a substitute proposition might be for GSA to make a one time determination after (X) years if repayment of original funding should be required. A concept basically similar to a contract subject to renegotiation."

"In Section 7(a)(1) (deferment of equity investments) I would like to attach some limitations to the roll-over provisions. First, I think it should apply only to individuals, not corporations. Second, I think there should be ceilings, i.e., the roll-over amount for any single investment should be limited to $100,000 or three times the amount of the original investment, whichever figure is greater. Beyond that, ordinary capital gains rates can apply."

"Section 5(a)8 - strike if possible."

"I am troubled by the glaring de-emphasis that (capital formation) has received. Access to capital-specifically, a proper mix of debt and equity capital that is consistent with a given firm's cash-flow generating capability - is the single most critical factor concerning the formation and development of technology based, small businesses. . . . I believe that the "bill" devoted too much attention to the patents issue without considering the fact that patents will remain as patents and not products unless technical entrepreneurs and small companies have sufficient access to start-up and expansion capital."

"Just a pro forma comment on the definition of 'small business'. I feel that it should be limited to companies with 100 employees or less."

"You may recall that (I) questioned the validity and objected to the priority given by our Advisory Committee to the reduction of the capital gains tax as a means for stimulating innovation."

In Section 5(a)(5) "with respect to $2 million of gross revenues and products employing patented items, some recognitions should be made of the value of the patented items in relation to the whole. For instance, the invention may be a $20 value, which is part of a $300,000 jet aircraft engine, and the $2 million test should certainly relate more closely to the quantity of $20 parts sold than to the quantity of aircraft engines incorporating the part sold."

"Also, I repeat my reservations about the elitism implicit in the use of the term 'innovative small businesses.' All small businesses should be deemed to have innovative potential - i.e., ability to improve productivity and create more jobs."

"Government should respect proprietary information submitted as part of proposals for contracts and unless information can be shown to be in the public domain, shall not divulge or use such information except for the evaluation of the submitted proposal. Under no circumstances shall this information be used as the basis of another RFP."

"Government shall not take proprietary ideas 'in house' after initial funding unless the contractors performance shall be deemed poor."

"In Section 7(d) - cannot agree that companies should be allowed to include up to 100 investors. Too many."

BIOGRAPHIES

MEMBERS OF SBA ADVOCACY TASK FORCE

Milton Bevington:

B.S. in Chemical Engineering, M.I.T., MBA - Harvard Business School. President and CEO of Servidyne, Inc.; former Executive Vice President of The Trane Co.

SERVIDYNE:

Founded in Atlanta in 1966. Supplies total energy management services to industrial, commercial, and institutional services. Clients are nationwide and in over 20 foreign countries. Headquartered in Atlanta, the company has 13 offices located throughout the country.

N. Paul Bosted:

M.S. in Physics, Sr. Fellow - Mellon Institute, Pittsburgh, Pa. Nine years - International Rectifier Corp., as President. Five years as an International Technical Consultant. Joined Sun Systems in 1976. Serves as President Expert in the field of electronics.

SUN SYSTEMS:

Founded in 1971, specializes in sophisticated digital electronic instruments for government installations, NASA and several Nuclear Energy plants. Clients include GE, International Harvester, Westinghouse. Presently have 12 employees. Size of business - $500,000 gross.

William Chandler:

Oregon State University, American Graduate School of International Management. Founder and President of Bay Venture Management, San Francisco, Calif. Formerly associated with Federal Reserve Bank, Raytheon, Veriflo Corp., and Western Growth Fund.

BAY VENTURE MANAGEMENT:

Organized in late 1975 as a venture development firm dealing with start-up companies in the bay area.

Dan Cronin:

B.A. Harvard, Economics, Cum Laude, 1950, Advanced Management Course, Harvard. Vice President, Small Business Association of New England. Formerly salesman, manager and then President of small hospital supply co., which merged in 1968 with a large company with 150 employees and 5 million in business. In 1974 served as Assistant to the then Secretary of Commerce, Elliot Richardson, 1977 joined Ampersand Associates, a venture capital firm. Also served on SBA Regional Advisory Council.

AMPERSAND ASSOCIATES:

Venture Capital firm with investments ranging from 1-1/2 million to 100 million. One client is #2 in the electronic cash register business.

Alfred C. W. Daniels:

E.E. Graduate of Arizona State University, Harvard Law School, also served as an Assistant Dean at Harvard. Vice President, New England, HH Aerospace Design Co., Inc. An officer and rated airline transport pilot, he has served in both command and staff R&D positions in the U.S. Air Force where he also earned four Air Medals with 200 missions in Viet Nam. Received the 1,000 Hour Sabreliner Flight Award. President, Black Corporation Presidents of New England, Inc., and a member of the Board of Directors, Smaller Business Association of New England, Inc.

HH AEROSPACE DESIGN CO., INC.:

A consulting firm established in 1974, incorporated in the State of New York. A 100% minority-owned corporation, serving the Eastern Seaboard. HHA's capabilities include R&D studies, economic analysis, design and engineering services in aerospace, electronics and transportation planning, including surface systems, tests and evaluation.

Dr. Orrie Friedman:

Ph.D. Chemistry - McGill University, 1944. Former Professor of Chemistry - Brandeis University. Left to organize Collaborative Research, Inc., in 1962. Has served as President & Science Director since its inception. His contributions to bio-medical research are included in over 90 science publications. Well known for basic discoveries in cancer chemo-therapy. Served on a number of Advisory Ctes at NIH. Member, Office and Director of several corporate, philanthropist and professional organizations.

COLLABORATIVE RESEARCH, INC.:

A high technology company with interests primarily in bio-medics and research and development. Organized in 1962 to undertake sponsored research, the company consists of two closely integrated operating divisions: Research and Pharmacutical Products, and a central Research Division. Company has expertise in a number of areas as the cutting edge of new cell and molecular biological technology.

Edward Gaffney:

Michigan Technology University, Mechanical Engineering. Developed and patented the cushion lift chair. Awarded U.S. Small Business Person of the Year in 1978, and Small Business Man of Wisconsin in 1977. President and Founder of Ortho-Kinetics. Currently Vice President of Independent Business Association of Wisconsin. Member of Wisconsin Legislative Council, Subcommittee on Small Business.

ORTHO-KINETICS:

Founded in 1963, small high technology based firm, specializing in research and development and manu-facture of the cushion lift seat and childrens care seats. Currently employs 50 people.

Clyde R. Goodheart:

B.S. in Biology, Northwestern University, MD - Northwestern Medical School, MS - Northwestern Graduate School. Three years at California Institute of Technology in Post-Doctoral Fellowship. Assistant Professor and Associate Professor, Department of Pediatrics, University of Southern California Medical School, Children's Hospital of Los Angeles. Well known for his work in cancer research, Dr. Goodheart has been involved in bio-medical studies and has written many scientific articles.

BIO LABS, INC.:

Founded in July, 1970 by Dr. Clyde R. Goodheart, it serves government and industry through contract research, product development programs, quality control testing, industrial microbiology. Current research areas include tissue culture work, immunology, biochemical and biophysical work with viruses.

Sidney Green:

B.S. University of Missouri in Mechanical Engineering, M.S. University of Pittsburgh, attended University of Pennsylvania Graduate School & received the degree of Engineer in Engineering Mechanics from Stanford University Formerly with Westinghouse Electric Company Research Labs, General Motors Defense Research Labs, & GM Technical Center. President & Chief Executive Officer of Terra Tek, he is active on many government committees & professional societies. Published over 40 open literature papers and reports, holds several patents.

TERRA TEK:

Founded in 1970 as a for-profit company, a springoff venture pursuing application of ideas primarily initiated at the University of Utah. Recognized as a leader in problem-solving applications involving rock mechanics, the geosciences and associated technology, and for its practical application of material sciences. Main lines of business include R&D, manufacture of sophisticated servocontrolled computer interfaced test systems, full-scale testing of drilling, mining and exploitation of new ventures.

Harold Guller:

Washington University School of Engineering. President and Chairman of the Board of Essex Cryogenics Industries, Inc., and President of its wholly owned subsidiaries: Essex Cryogenics of Missouri, Inc., Higgs Screw Products, Propellex Corp., and Essex Precision Controls, Inc. Serves as Chairman of the St. Louis District Advisory Council of the Small Business Administration. Member of various local and regional advisory and technical committees and several civic organizations.

ESSEX CRYOGENICS INDUSTRIES, INC.

Designs and produces hydraulic, pneumatic fuel, electronic and electromechanical components and subsystems for aircraft applications. Selected as the Small Business Prime Contractor of 1971 for Region VII, Small Business Subcontractor of 1972 for Region VII; Small Business Subcontractor of 1973 for Region VII and National Small Business Subcontractor of the Year 1973.

Dr. Eugene Haddad:

B.S. Engineering Physics, Alabama Polytechnic Institute of Technology, M.S. in Physics, University of California, Ph.D., University of Utah. Formerly staff member of Los Alamos Scientific Laboratory and AEC Research Division. 1966-1967 Visiting Professor of Physics, Catholic University. 1968-1969 Assistant to Deputy Director of Science and Technology, U.S. Defense Atomic Support Agency. 1969-1975 Executive Vice President, Columbia Scientific Industries Corp., Austin, Texas. Since 1976, President, Chief Executive Officer and Director of Columbia Scientific Industries Corp. Member of several professional and honorary societies. Has published numerous papers in scientific journals.

COLUMBIA SCIENTIFIC CORPORATION:

The main thrust of the company is in the design and manufacture of high quality environmental and safety equipment. The company also conducts research for federal, state and local governments, as well as the private sector. Located in Austin, Texas, the company employs 85 people and has an annual sales volume of approximately $4.5 million.

Roger Hill:

B.S. Physics, Brown University, M.S. Elec. Engr., Northwestern University, Doctorate studies at Northwestern University. Small Business person of the Year in State of Wisconsin, 1978. Member of Independent Business Association of Wisconsin, Special Committee on Small Business of Wisconsin Legislative Council, First National Bank Board of Directors, International Trade Subcommittee of the Chamber of Commerce of the U.S., Institute of Elec. & Electronic Engrs.

GETTYS MANUFACTURING CO.:

Founded in 1959 by Roger Gettys Hill, as a three-person engineering and consulting firm and later dynamically expanded into an international, multi-million dollar enterprise with subsidiaries in England, Germany and Italy. Today, Gettys and its licensee supply over 50% of the world DC servo drive market. In 1965 introduced world's first all-electronic three-dimensional tracer.

Robert Hillas:

B.A. Dartmouth, MBA - Stanford University. Seven years as a Venture Capital Investment Specialist with E.M. Warburg, Pincus and Company. Serves on two Boards of Directors and one Advisory Committee of Investee Companies.

E. M. WARBURG, PINCUS, & CO.:

Specialists in financial services. One of the larger private venture capital pools in the country. Deal with start-up money particularly in large publicly held companies.

Patrick Iannotta

Majored in Economics, Queens College, Member, Treasury Advisory Council; New York State Governors High Technology Task Force; President of Ecolotrol for past ten years.

ECOLOTROL, INC.:

Founded in 1969, developed a standardized treatment system for industrial waste water and municipal sewage. Number of plants in design & construction throughout the world. Currently commercializing sophisticated instruments and control devices in the energy area. Ecolotrol holds several patents.

Charles G. James:

B.S. in Business Administration - Bowling Green State University. Treasurer and member of Board of Directors, The Sea Pines Company, Hilton Head, South Carolina. Staff person, Laurance S. Rockefeller, New York. Group Vice President of Heizer Corporation, Chicago, Illinois, a venture capital firm, currently with Battelle Memorial Institute, Columbus, Ohio, as President of Scientific Advances, Inc., a wholly-owned subsidiary of Batelle.

SCIENTIFIC ADVANCES INC.:

Provides financial, management, and technical support for companies or projects originating within or without Battelle; a whollyowned subsidiary of Battelle Memorial Institute, Columbus, Ohio. SAI was conceived as a source for short run production, marketing and eventual disposition of unique Battelle developed products, SAI has shifted to the formation and growth of new ventures to introduce innovative technology.

Paul Kelley:

Harvard, MBA, Northeastern University. Is a doctoral candidate at Boston University. Is responsible for implementing the Massachusetts Technology Development Corporation Revolving Loan Fund program. Has been personally involved in several turn-around situations and technology-based start-ups. He was instrumental in putting together the financial packages for over 40 successful start-up, technology-based companies. President of SUN Community Development Corp. and is the Senior Lecturer in the Venture Development Program at Boston State College.

MASSACHUSETTS TECHNOLOGY DEVELOPMENT CORPORATION:

A public-purpose development finance mechanism established by an act of the Massachusetts State Legislature in July 1978. Has the dual capability to provide management and direct financial assistance to early-stage, technology-based small businesses in Massachusetts. The MTDC can provide seed capital to commercialize new technologies which will foster primary job creation and increase tax revenues and exports.

Gilbert V. Levin:

B.E., The Johns Hopkins University, 1947, M.S.,1948, Ph.D., 1963, Environmental Engineering. President and Founder, Chairman of the Board of Directors, Biospherics Inc., Rockville, Md. Formerly Director, Life Systems Division. Member, Board of Directors, Hazelton Labs, Inc., Falls Church, Va. Holds more than 33 patents in biological treatment of wastewater and in microbiology. Member of several honorary science associations & author of approximately 100 technical publications.

BIOSPHERICS INCORPORATED:

Organized into three major operating divisions: The Environmental Instrumentation Division which develops, manufactures, and markets sophisticated innovative instruments in the fields of pollution control and health; the Laboratory Division which performs contract research and development on environmental and health problems, develops Biospherics proprietary products in these areas and offers commercial analytical services in chemistry, biochemistry, microbiology, pesticides, and toxic substances; the Science Writing Division which writes, edits, produces and disseminates information in these areas of interest.

Harold K. Lonsdale:

B.S. Chemistry, Rutgers University, 1953. Ph.D in Physical Chemistry, Pennsylvania State University, 1957. Formerly, Nuclear Research Officer, U.S. Air Force, staff member, Research and Development Laboratory, General Atomic Co., Principal Scientist, ALZA Corp., and Visiting scientist, Max Planck Institute of Biophysics, Frankfurt, West Germany, and the Weizmann Institute of Science, Rehovot, Israel. Since 1974, President of Bend Research Inc., Bend, Oregon. Member of the American Chemical Society, Editorial Board of Desalination Journal and Editor of the Journal of Membrance Science. Adjunct Professor, Oregon State University. Author of many publications.

BEND RESEARCH, INC:

Is a young firm engaged in contract research and development for industry and government. Their field of expertise is membrance science and technology.

David T. Morgenthaler:

Massachusetts Institute of Technology, B.S., M.S. (mechanical engineering), Licensed Professional Engineer. Presently, Senior Partner, Morgenthaler Associates since 1969. Formerly with Foseco, Inc., as President and Vice President of Delavan Manufacturing Co. Chairman, National Venture Capital Association. Holds directorships with numerous companies throughout the country and member of several civic and regional organizations.

MORGENTHALER ASSOCIATES:

A private venture capital firm founded in 1968 by David Morgenthaler. The company's objective is to obtain substantial long term gains by investing in companies which offer some kind of proprietary product or service. It invests throughout North America and is interested in all types of business. The firm's normal investment size ranges from $100,000 to $300,000 in a given investment.

George W. Murphy:

B.S., Fordham, 1960. From 1958 to 1970 employed by IBM in various marketing and management positions. Since 1970 President and Chief Executive Officer of Educational Computer Corporation.

EDUCATIONAL COMPUTER CORPORATION:

Is the industry leader in research, development, and production of low cost computer controlled simulation devices that are used in advanced training programs. ECC blends computer technology with modern task oriented instructional methods to produce fully integrated technical training programs.

Dr. Arthur S. Obeymayer:

B.A. with High Honors, Swarthmore College, 1952. Ph.D. in Chemistry, M.I.T., 1956. Recipient of NST fellowships. President and founder of Moleculon Research Corporation. Founder and first Chairman of the Research Management Association. Currently, Vice President of the American Association of Small Research Companies. Has served in various capacities in the Association of Technical Professionals, Boston Industrial Mission, Federation of American Scientists and the Small Business Association of New England. Is frequently called upon by the Federal and Massachusetts state governments to serve in an advisory capacity.

MOLECULON RESEARCH CORPORATION:

Specializes in research, development and consulting in chemistry and allied fields. These services range from feasibility studies and product development to problem solving, chemical engineering investigations, and process development. Moleculon makes Poroplastic R film and powder. Product applications include controlled release materials, dermatological preparations, membrane separations for hydro-metallurgy and impurity removal from waste water, and color change monitoring of toxic vapors.

Dr. Judith H. Obeymeyer:

B.S., mathematics, Carnegie - Mellon University, 1956. Ph.D. in Mathematics, Harvard University, 1963. Assistant Professor, 1960-1966 Wellesley College. In 1978 taught mathematics at the University of Massachusetts. Recipient of four NSF Fellowships. Since 1968 Trustee and Manager of Technology Really Trust. Has served in a number of capacities with Moleculon Research Corporation for the last fifteen years. Has served as officer and on the board of numerous civic and charitable organizations and is a member of several honorary and professional societies.

MOLECULON RESERACH CORPORATION:

Specializes in research, development and consulting in chemistry and allied fields. These services range from feasibility studies and product development to problem solving, chemical engineering investigations, and process development. Moleculon makes Poroplastic R film and powder. Product applications include controlled release materials, dermatological preparations, membrane separations for hydro-metallurgy and impurity removal from waste water, and color change monitoring of toxic vapors.

Tom Perkins:

Degree in Electrical Engineering, Massachusetts Institute of Technology, M.B.A., Harvard Graduate School of Business Administration. Venture Capitalist with Kleiner, Perkins, Caufield, & Byers, San Francisco. Director, National Venture Capital Association, past President, Western Association of Venture Capitalists. Co-founder of Optics Technology and founded University Laboratories which became the leading producer of inexpensive gas lasers.

KLEINER, PERKINS, CAUFIELD & BYERS:

An active venture capital partnership with a capitalization of $15 million. Investments typically range from a minimum of $200,000 to a maximum of $1 million. They seek opportunities with the potential to achieve significant shares of high growth markets. Examples: computers & computer peripherals, office equipment, medical products and instruments, microbiology, genetic engineering, telecommunications, semiconductors, laser & optics, and pollution control.

Harry D. Richardson:

SCMP - Harvard University, 1976; MS - Engineering, University of Alabama, 1950; BS - Mechanical-Electrical Engineering, Louisiana Polytechnic Institute, 1941. Chairman and President of Nuclear Systems, Inc. since 1971. Currently consulting Professor to Louisiana State University. Member of the Board of Directors of several companies and member of numerous professional societies.

NUCLEAR SYSTEMS, INC.:

Is a small technology company. Primarily it is engaged in (1) developing, manufacturing, and marketing equipment using radioisotopes, (2) environmental and quality control testing electronic components, and (3) developing, manufacturing, and marketing products for management and conservation of energy in homes and small commerical buildings. In 1979, the sales volume is estimated to exceed $6 million. There are 250 employees located in six U.S. locations and one manufacturing plant in Mexico. NSI is a public company with nearly 500 stockholders.

Walter D. Syniuta:

Sc.D - M.I.T., Mechanical Engineering, M.Sc, Queens University, B.Sc, Queens University. President, Advanced Mechanical Technology, Inc. Formerly with Scientific Energy Systems Corp., Assistant & Associate Professor of Mechanical Engineering, M.I.T., Engineering Consultant, Development Engineer & Vibration Engineer. Member of various professional societies & author of several publications relating to his expertise in the field of electron microscopy.

ADVANCED MECHANICAL TECHNOLOGY, INC.:

A Massachusetts corporation engaged in R & D, and manufacturing of instrumentation. Engaged in R&D in the field of energy conversion systems, with current development programs in gas-fired hot water heaters, gas-fired residential space heating, waste-heat recovery systems, a novel heat-actuated heat-pump based on the Stirling cycle, use of ceramics in heat engines, and heat engine combustion research. AMTI is currently engaged in several commercial engineering projects .

Bruno O. Weinschel:

Dr. Engineering degree from the Technische Hochschule, Munich, Germany. Since 1952, President of the Weinschel Engineering Co., Inc. He is known for his work in the state of the art of insertion-loss microwave measurement. Serves as Director of the Precision Measurements Association. A Fellow in the Institution of Electrical Engineers. Editorial review boards of The Microwave Journal and Microwave Systems News. Author or co-author of forty journal articles and inventor or co-inventor of twenty patents.

WEINSCHEL ENGINEERING COMPANY, INC.:

A leader in the design and manufacture of high quality instruments and components for use throughout the microwave industry. Known worldwide for their precision and quality. Contributor to the advancement of microwave technology. Complete in-house, totally integrated engineering, machining and assembly, with inspection and test procedures in Gaithersburg, Md.

Robert F. Zicarelli:

B.S. and MBA - Northwestern University. Has been with Northwest Growth Fund, Inc. for 18 years, having joined NWGF as Vice President and Director in 1961. His investments in venture capital experiences span 30 years. A member of the Board of Governors of National Association of Small Business Investment Co.'s. (NASBIC) and Board of Directors, National Venture Capital Association. Past President of Regional SBIC Association and member of SBA National Advisory Council.

NORTHWEST GROWTH FUND:

Founded in 1961, it is an SBIC headquartered in Minneapolis with offices in Denver and Portand. It is a wholly-owned subsidiary of Northwest Ban Corporation. It has assets in excess of $40 million and investments in more than 50 small businesses, employing over 15,000 people. NWGF has invested in a broad range of apparel and personal products, electronics, basic manufacturing, communications, industrial and consumer services. One of the largest SBIC's in the country actively dedicated to venture capital funding.

BIOGRAPHIES

MEMBERS OF COMMERCE INNOVATION
SMALL BUSINESS "TASK FORCE"

Mr. Wayne Coloney:

Texas A&M, Summa Cum Laude Graduate - Georgia Institute of Technology, 1950. Serves as Chairman of the Board & Chief Executive Officer of the Wayne H. Coloney Co., Tallahassee, Florida. Formerly associated with Barrett, Daffin & Coloney, and J.E. Greiner & Co., Tampa. A professional engineer certified in Florida, Georgia, Alabama, and North Carolina. Member of American Society of Civil Engineers, National Society of Professional Engineers and numerous other organizations, both professional & philanthropic. Listed in Who's Who in the World and in the South and Southwest. Mr. Coloney holds several patents and has published articles related to his extensive interest in knowledge of land planning, transportation facilities, drainage and air pollution and historical renovation.

WAYNE H. COLONEY COMPANY:

Founded in 1970 as a broad-based engineering firm dealing with structural, mechanical and legal engineering in the areas of land planning, pollution control and design. Grew from three employees in 1970 to presently 200. Awarded in 1972 - Pollution Control Citation, 1975, SBA Regional Prime Contractor of the Year, placed in top 500 design firms chosen by McGraw-Hill magazine.

Eugene M. Lang:

B.A. from Swarthmore College, M.S. from Columbia University, mechanical engineering studies at Brooklyn Polytechnic Institute. Currently, President of REFAC Technology Development Corporation of New York City. Chairman of Scriptomatic, Inc., Philadelphia, Pa., Chairman of J.D.S., Inc., a West Palm Beach, Florida real estate company, Chairman, Electronic Research Associates Inc., Moonachie, New Jersey, a manufacturer of power supplies and loudspeakers. Chairman of REFAC

Electronics Corp., Barkhamsted, Conn., manufacturer of microminiature display devices and switches. Serves on Department of Commerce, Advisory Committee on Science and Innovation.

REFAC TECHNOLOGY DEVELOPMENT CORPORATION:

Since 1952, this company's principal business has been international technology transfer -- the creation of manufacturing licenses and joint ventures as a means for client manufacturers to enter export markets. Most REFAC clients are smaller companies that have specialized industrial products or manufacturing processes.

George Lockwood:

B.S. in Civil Engineering, Northwestern University M.B.A.- Harvard University, Currently President & Founder of Monterey Abalone Farm, Founder of Monterey Kelp Corporation which was acquired by Merck & Co., Inc. Formerly with Global Marine, a pioneer firm in off-shore oil well drilling. Mr. Lockwood holds several patents in his varied background including electronics & electronics manufacturing, oceanography & oceanography engineering, civil engineering, heavy construction & chemical processes.

MONTEREY ABALONE FARM:

Founded in 1972, specializes in domesticating the abalone species of the marine snail in California. In the first part of its history the company did extensive research in biological, environmental & nutritional factors relative to commercialization. Currently undergoing a major expansion of its operations.

Duane D. Pearsall:

B.S. from University of Denver, Commercial Engineering. General Motors Institute. Founder and President of the Small Business Development Corporation. Previously founded and was President of the Pearsall Company (1955-1966) and of Statitrol Corporation (1964-1977). Member of several professional societies. Member of Executive Committee and Board of Directors of Denver Chamber of Commerce and Council of Small Business of the Chamber of Commerce of the U.S., Regional Vice Chairman for Small Business, N.W. Region. Serves on S.B.A. Colorado District Advisory Council and M.F.I.B. Action Council Committee. Has published several technical papers. Colorado Small Business Person of the Year - 1976. National Small Business Person of the Year - 1976. Outstanding Citizen Award Mile High Sertoma Club - 1978. Serves on the Board of Directors of several companies and organizations.

SMALL BUSINESS DEVELOPMENT CORPORATION:

This was formed to support three activities - as consultant to small businesses, as an investor in small business and to organize a stronger voice for small business in Federal legislation.

Eric P. Schellin:

A.B. Columbia University, J.D., George Washington University. Lecturer, Patent, Trademark & Copyright Law, Georgetwon University, 1974-present. Executive Vice President of the National Patent Council, Inc., Chairman of the Board of Trustees of the National Small Business Assoc., 1979. President, Erdo Co., Member of various legal & scientific associations and the bar of V.A., D.C., Supreme Court and Court of Customs and Patent Appeals.

Robert C. Springborn:

B.S. University of Illinois, 1954, Ph.d. Organic chemistry Cornell University, 1954. Since 1972 Chairman and President of Springborn Laboratories, Inc. Formerly, Chairman and President of General Economic Corporation; Vice President, Chemical Group and General Manager of New Ventures Division, W.R. Grace; General Manager, Food and Chemicals Division, Ionics, Inc.; and Vice President, Technical Director, Ohio Rubber Division of Eagle-Picher Industries, Inc. Hold several patents in the field of high polymers. Several papers on entrepreneurship. Member of numerous professional, civic honorary societies. Chairman of the Coalition of Small Technical Businesses.

SPRINGBORN LABORATORIES, INC.:

Is an internationally oriented, employee-owned company. Serving the chemical and allied products industry with special expertise in high polymers offices in the U.S., Europe and Asia.

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APPENDIX I

A Report of Small Business Members Who Served on the Industrial Innovation Advisory Committee That Was Established as Part of the Domestic Policy Review

THE EFFECTS OF DOMESTIC POLICIES OF THE FEDERAL GOVERNMENT UPON INNOVATION BY SMALL BUSINESSES

A Report of Small Business Members
Who Served on the Industrial Innovation Advisory Committee
That Was Established as Part of the Domestic Policy Review.

May 1, 1979

NOTICE: This report represents the views of the several members from small business who served on the Advisory Committee on Industrial Innovation, an advisory committee that was convened by and reported to the Secretary of Commerce. This report of the committee members from small businesses does not necessarily represent the views of the Department of Commerce, the Small Business Administration, or any other agency of the Federal Government.

INTRODUCTION

In mid-1978 President Carter ordered a review of the impact of federal policies upon industrial innovation. The President directed Secretary of Commerce Juanita Krepps to supervise this study, and she appointed an Industrial Advisory Committee to work under the direction of Dr. Jordan Baruch, Assistant Secretary for Science and Technology to advise her on this project. This Industrial Advisory Committee was composed of approximately one hundred and fifty business executives who were divided into seven subcommittees to analyse specific areas of federal policy and their impact upon private decision making relative to innovation.

While most members of the several subcommittees were from large corporations, each group included one executive from small business who participated in the work of the Committee and made contributions to the draft reports that were produced. Because the small business representation was limited in comparison to the much larger representation of large corporations, one would expect that the subcommittee draft reports would not analyse the small business situation in appreciable depth. There is however, almost universal recognition by the seven subcommittees that small businesses make a large contribution to innovation, and that the policies, laws, regulations and procedures of the Federal Government impose a very heavy burden upon small business innovation.

Upon completion of the draft reports of the seven subcommittees, the small business representatives decided that an additional report should be prepared on the specific impact of federal policies upon innovation in small businesses, and how federal policies might be revised to again stimulate innovation in this important sector of the economy. We wish to emphasize that our report is not a minority report expressing disagreements with the subcommittees, but a supplement to address the importance, and the unique role and problems of small innovative enterprises in America. We wish to place emphasis upon certain areas of the draft reports and make additional recommendations of our own.

Without detracting from the strong vigor of our recommendations, it must be noted that there are diverse opinions amongst our Committee members with respect to emphasis, priority, and details of our recommendations.

THE AD-HOC COMMITTEE OF SMALL BUSINESS MEMBERS*

George S. Lockwood, Acting Chairman
President
Monterey Abalone Farms
Monterey, California
(Member--Subcommittee on Environment, Health and Safety Regulations)

Wayne H. Coloney
Chairman and Chief Executive Officer
Wayne H. Coloney Company
Tallahassee, Florida
(Member--Subcommittee on Procurement and Direct Support of Research and Development)

Eugene M. Lang
President
REFAC Technological Development Corporation
New York, New York
(Member--Subcommittee on Economic and Trade Policy)

Duane Pearsall
President
Small Business Development Corporation
Littleton, Colorado
(Member--Subcommittee on Industry Structure and Competition)

Eric Schellin, Esq.
Attorney at Law
Arlington, Virginia
(Member--Subcommittee on Patents and Information)

Dr. Robert C. Springborn
President
Springborn Laboratories
Enfield, Connecticut
(Member--Subcommittee on Procurement and Direct Support of Research and Development)

*The membership listed after each name indicates the Subcommittee of the Industrial Innovation Advisory Committee upon which the individual served.

SUMMARY OF CONCLUSIONS

. Innovation is an essential ingredient for creating jobs, controlling inflation, and for economic and social growth.

. Small businesses make a disproportionately large contribution to innovation. There is something fundamental about this unusual ability of small firms to innovate that must be preserved for the sake of healthy economic and social growth.

. If the U.S. desires to bring inflation under control, to create new and better jobs, and to continue to enjoy the economic and social benefits of innovation, individual entrepreneurs and their small companies must be free to innovate. Unfortunately, the environment for small business innovation has greatly deteriorated during the past decade.

. The creative processes in small businesses are pronouncedly different from large corporations and institutions. There is a lack of awareness within government of how small independent innovators create and how federal policies determine the climate for small business innovation.

. A wide array of federal policies adversely impact upon small innovative businesses, including:

--Federal tax, pension fund and security policies that have virtually eliminated all forms of capital from small innovative business ventures;

--Government regulations that treat large and small firms equally that are, in fact, discriminatory against small firms;

--Federal funding for research and development where the most innovative sector of the American economy, small science and technology based enterprises, are virtually excluded from effective participation;

--Federal procurement policies that similarly exclude small innovative firms;

--Patent policies that have resulted in the diminution of the value of patent protection for independent inventors and small businesses.

. With sufficient amendments to Domestic Policies to provide relief for small creative enterprises, a major renaissance in anti-inflationary innovation will emerge with concomitant social and economic growth. Such amendments will require a major departure from current policies affecting small businesses in capital acquisition, regulation, R & D funding, procurement and patents.

SUMMARY OF RECOMMENDATIONS

1. Changes in the federal tax code to again encourage the flow of capital into small innovative businesses.

2. Changes in ERISA policies to return a portion of our national flow of savings to high-risk innovation.

3. Changes in security laws and regulations to remove obstacles for innovative enterprises to acquire seed, start-up and expansion capital.

4. Changes in regulatory policies to remove adverse discrimination against the small innovator.

5. Changes in federal R & D funding policies to produce substantially greater results by awarding a larger share to small businesses.

6. Changes in federal procurement policies to allow greater participation by small businesses on a more equitable basis.

7. Strengthening our weakened patent system, and making changes in federal policies to recognize and protect initial exclusivitiy as an essential requirement for successful innovation.

Specific details for these recommendations are included at the end of this report.

THE EFFECTS OF DOMESTIC POLICIES OF THE FEDERAL GOVERNMENT UPON INNOVATION BY SMALL BUSINESSES.

Innovation is an essential ingredient for economic and social growth. It is the driving force that increases productivity and that results in new products, processes and services. Innovations create new and better jobs, reduces production costs and prices, increases foreign sales, and increases real personal income so that our citizens can finance major advancements in the qualities of life such as better education, improved health care, increased longevity, and more leisure and recreation.

Without innovation, economic stagnation occurs resulting in rising prices, decreased employment, and increased foreign competition--all symptoms of stagnation induced inflation. Inflation, our nation's major problem is, in our opinion, a direct result of a large decline in private sector innovation over the past decade.

To a large extent, the madates of the United States electorate to fulfill basic social and human needs of our citizens requires a rapid rate of economic growth. Such social and economic growth can only occur with vigorous private sector innovation.

SMALL BUSINESSES MAKE A DISPROPORTIONATELY LARGE CONTRIBUTION TO INNOVATION.

The economic history of the United States is replete with examples of small innovators making major contributions. From the late 1700's through the 1970's a major source of technological advancement was the result of individual inventors and entrepreneurs working independently of our large industrial corporations, universities, and government laboratories. This is particularly true in situations where radically new concepts have been introduced.

In our early history we had Eli Whitney in 1793 with his cotton gin and Robert Fulton with the steamboat in the 1840's. These two innovations had an enormous impact on young America. Later came the railroads. Next, in telecommunications, we had Morse and Bell, whose contributions greatly accelerated the growth of our economy. Similarly, Edison, Westinghouse, McCormack, the Wright Brothers, Ford and DeForest made introductions that laid the foundation for further economic advancements. This is only a partial list. All of these innovators were small guys.

The same trend continued after World War II with the success stories of Land at Polaroid and Watson at International Business Machines. During the 1960's we saw the emergence of companies such as Xerox, Digital Equipment and Hewlett-Packard, each beginning as individuals with their small companies who were free and able to innovate. In addition to these better known names, there were thousands of small high-technology companies spawned during the 1950's that have created major growth in our economy and have increased the quantity and quality of employment.

A recent study by the National Science Foundation concluded that in the post World War II period, firms with less than one thousand employees were responsible for half of the "most significant new industrial products and processes." Firms with one-hundred or fewer employees produced twenty-four percent of such innovations. In addition, the cost per innovation in a small firm was found to be less than in a large firm since small firms produced twenty-four times more major innovations per research and development dollar expended as did large firms. Yet small firms conduct only three percent of United States research and development. While there is much innovation that can only occur in large resourceful companies, small firms are often more adventuresome and have a greater propensity for risk taking, and accordingly are able to move faster and use resources more efficiently than large companies. We believe that there is something fundamental about the unusual ability of small firms to innovate that must be preserved for the sake of healthy economic and social growth in the United States.

SMALL INNOVATIVE BUSINESSES CREATE JOBS AND TAX REVENUES AT A RAPID RATE.

The role of small innovative businesses in stimulating economic growth can be seen from two recent studies. The first, by the Massachussets Institute of Technology Development Foundation, shows compounded average annual growth from 1969 to 1974 for the following three groups of companies:

	Sales	Jobs
Mature Companies	11.4%	0.6%
Innovative Companies	13.2%	4.3%
Young High-technology Companies	42.5%	40.7%

In this study, Mature Companies were Bethlehem Steel, DuPont, General Electric, General Foods, International Paper and Proctor & Gamble. Innovative Companies were Polaroid, Minnesota Mining and Manufacturing, International Business Machines, Xerox, and Texas Instruments. Young High-technology Companies included Data General, National Semiconductor, Compugraphics, Digital Equipment, and Marion Laboratories. The companies selected in each group were, in every case, leaders in their particular industry.

The M.I.T. report states:

> "It is worth noting that during the five year period, the six mature companies with combined sales of $36 billion in 1974 experienced a net gain of only 25,000 jobs, whereas the five young, high-technology companies with combined sales of only $857 million had a net increase in employment of almost 35,000 jobs. The five innovative companies with combined sales of $21 billion during the same period created 106,000 jobs."

This study also observed that the Innovative Companies produced three times the level of tax revenues as a percentage of sales as did the mature firms.

Conclusions similar to those mentioned above emerged from a study of 269 firms by the American Electronic Association. In February 1978, Dr. Edwin V. Zschau of the A.E.A. presented the results of that study to the Senate Select Committee on Small Business. The report showed the following growth of employment for new established firms as contrasted to more mature companies:

Years Since Founding	Stage of Development	Employment Growth Rates in 1976
20+	Mature	0.5%
10-20	Teenage	17.4%
5-10	Developing	27.4%
15	Start-up	57.7%

Dr. Zschau also reported that annual benefits to the economy realized in 1976 for each $100 of equity captial that had been invested in Start-up companies founded between 1971 and 1975 were:

. foreign sales	$70 per year
. personal income taxes	$15 per year
. federal corporate taxes	$15 per year
. state and local taxes	$5 per year
. total taxes	$35 per year

This data shows that the benefits of investment in small innovative ventures are large (e.g., jobs are created and these jobs are kept at home--exports are created instead of imports--a new $35 per year flow in tax revenues is realised for each $100 initial investment). This large and powerful flow of benefits starts soon after the investment is made, and the benefits are substantially greater than those of large corporations.

The huge benefits derived from a favorable climate for small business innovation is apparent from this review of the contributions to economic growth made by individual entrepreneurs and their small companies. If the U.S. desires to bring inflation under control and to continue to enjoy the economic and social benefits of innovation, individual entrepreneurs and their small companies must be free to engage in innovation.

THE ENVIRONMENT FOR SMALL BUSINESS INNOVATION IS NOT HEALTHY.

It is clear to us that innovation is the keystone of economic and social growth, and that individual entrepreneurs and their small innovative businesses have contributed a disproportionately large share of innovation. It is also clear that the climate for the formation and nurturing of small innovative enterprises in America has suffered a major deterioration over the past ten years and as a result innovation has withered.

There are no concise indices for innovation, although productivity is one measureable result. From the close of World War II until the mid-1960's, the average annual productivity increase for each manufacturing worker was approximately 4.1 percent. From the late 1960's through the mid 1970's, it averaged 1.6 percent per year. In 1978 it was 1.0 percent, and some economists are predicting a rate of 0.4 percent for 1979. This is a ten fold decline that has occurred steadily over the past fifteen years.

Similar trends of a substantial downward nature can be observed in the flow of capital to small firms. In the seven years from 1969 through 1975, the amount of capital acquired by small firms with less than $5 million in net worth from public markets declined from approximately $1,500 million to approximately $15 million--a 100 fold decrease. No significant improvement has occurred in the past three years. However, during this period of catastrophic decline, capital raised by all corporations in the public security markets increased from $28 billion in 1972 to over $41 billion in 1975, or an increase of approximately 50 percent. This 100 fold decline in capital flow to small innovative enterprises is indicative of the decline in small business innovation because risk-capital is an essential ingredient of innovation.

Without precise indices for small business innovation, it is impossible for us to quantify this key factor accurately. It is our observation as experienced entrepreneurs in our respective industries however, that the vigor in small business innovation has substantially declined. We would estimate that this decline amounts to a level of 10 percent (or less) of the average innovation from 1950 to 1970--or at least a ten fold decline. We regret that we cannot be more precise in estimating this important factor, but we believe that this estimate, based upon our personal observations, is realistic.

In our opinion, a renaissance in innovation in America is possible, but a basic systemic change must first occur in governmental policies affecting small innovative businesses. The needs of innovators, their incentives to innovate, and obstacles to their creativity are often substantially different for small firms than for large mature corporations. In most cases government policy-makers and administrators fail to recognize this critical difference between large and small businesses. As a result, major constraints to innovation unintentionally imposed by government must be modified if a rebirth of vigorous innovation is to occur in the United States.

THE DISTINCTIVE CHARACTERISTICS OF THE CREATIVE PROCESS IN SMALL BUSINESS.

Creative processes in small businesses have some pronounced differences from the creative processes in large corporations. In both cases, however, the processes usually have the following steps in common:

. Conception--the use of scientific, market or other knowledge to conceive a new product, process or service to fill a need.

. Reduction to practice--taking this concept from an idea into a practical reality, such as a first-model prototype.

. Start-up--adapting the first-model prototype for production and sales.

. Expansion--with successful early production, expansion of production and sales.

With success, a concept moves laboriously through these stages until the firm and its markets mature. Signficant employment and tax revenues are generated during the later stages of this process.

Until maturity is achieved and expansion levels out, this creative process is usually a struggle for the innovator and his small firm--

--a struggle to obtain adequate capital (usually in several increments);

--a struggle to make the breakthroughs necessary to overcome the never ending unexpected obstacles;

--a struggle to make the first precious sale (or to get the first proposal accepted), to meet an optomistic delivery schedule, and to keep the first customers happy;

--a struggle to keep development costs and initial production costs within available capital;

--a struggle to collect accounts-receivable and other payments in time to meet the next payroll (a particular struggle when selling to the government);

--a struggle to convince the banker that sales, production cost, and cash flow projections are realistic and that customers will pay on schedule;

--a struggle to acquire and motivate a team of capable scientific, engineering, production and management talent.

There is usually a delicate balance between success and failure in this struggle.

The capital required for this creative process is usually acquired from individual outside sources and not from a flow of earnings as is the case of large corporations; a critical difference between large and small firms.

Entrepreneurs often spend 15 hours per day, seven days a week, to meet this challenge. Time and personal energy are the most precious assets in this process. The intensity of this struggle, requiring the strong personal commitment of the innovator, is usually much greater in a small business than in a large corporation. The willingness of the small business innovator to undertake this intense struggle is one significant reason why small businesses make disproportionately large contributions to innovation. The intensity of this struggle and the vigorous committment with which it is executed by the entrepreneur is a unique component of small business innovation.

WHAT INCENTIVES MOTIVATE THE SMALL INNOVATOR TO MEET THIS STRUGGLE?

New concepts are only generated from individuals, and creative indivudals need an environment that is conducive for creation with rewards, recognition, profits, freedoms, and the availability of capital, basic knowledge and other tools with which to create. There appears to us to be a lack of understanding within government of how individuals create in the private sector, and how they implement their creations--particularly small independent innovators.

The stimulation of setting out on one's own, trying his own ideas, working in an environment with few disapproval levels, that permits and encourages new approaches and even radical ideas, and has a "put your entire personal assets on the line" element of risk, coupled with a chance for a reward of above average wealth for his intense labors, are important motivations for the innovator in small businesses that are different from large corporations.

During the historically innovative 1950's and 1960's, and even into the early 1970's, there was a steady stream of individuals who were motivated to leave large corporations, universities and government to form small scientific and technical businesses. This stream is now a dribble. There was, at that time, a favorable climate where the creative individual had freedom to innovate and had access to capital.

Since then many governmental disapproval levels and obstacles have emerged, risks have gone up, rewards have come down--and at the same time the availability of capital for small American enterprises has declined to an all time low. The entrepreneural climate is now dismal and a substantial portion of the community of the technically creative are dispirited. There are mountains to be climbed that are going unclimbed. There is useful scientific knowledge that has been developed in our universities and elsewhere that is not being used to fill social and economic needs. There are products to be developed and manufactured

that are still only ideas in inventors heads. There are innovative businesses that should be started that are not being started. This inability for creative individuals to undertake is of great concern to this Committee.

FEDERAL POLICIES DETERMINE THE ENTREPRENEURAL CLIMATE

There is a wide array of federal policies that adversely impact upon small business entrepreneurs that have resulted in the arrest of this heretofore highly innovative sector of our society. The federal policies that determine the entrepreneural climate are in the following areas:

. Capital Availability. Unlike large corporations that fund R & D and other innovative investments from cash flows from mature products, a small business innovator must acquire capital from outside sources. Federal tax, pension fund and security policies have virtually eliminated all forms of seed, start-up, and expansion capital from small innovative business ventures.

. Regulation. Two essential requirements for the creative individual are time and freedom to create. Both time and freedom are being consumed with the ever increasing scope of government regulatory activities that have emerged since 1970. Interferences and delays by government compound the entrepreneur's struggle, sap his creative energy, and increase the risk of failure. Many small firms are unable to understand and comply with government regulatory processes and to effectively participate in law and rule-making that have a life or death impact upon their firms. The present system of applying regulations equally to large and small businesses heavily discriminates against small businesses.

. Federal Funding for R & D. In recent years, federal support for R & D has declined as a percentage of GNP and has become highly concentrated in a few large companies, universities and federal laboratories. While direct support for applied research and development at these institutions has grown, the most innovative sector of the American economy, small science and technology based enterprises, are virtually excluded from effective participation in federally funded applied research.

. Federal Procurement. The largest buyer of goods and services in the world is the U.S. government. The process of selling in this market and meeting government specifications chews the small innovative business to bits. There is little room for innovation within federal supply specifications and procurement procedures. The effect of these procedures is to prevent small business participation and deny the government of potential sources of innovation that would lower procurement costs, and provide new and improved products and services. In the interest of innovation and of good procurement, small innovative firms should be provided greater participation in this important market.

. Patents. The historic keystone to inventiveness and information transfer has been our U.S. patent system. Patent grants have provided the small innovator protection against competition by large resourceful firms, and this protection has often provided incentives for capital acquisition. Unfortunately in recent years the value of patents has weakened considerably due to inadequate Patent and Trademark Office procedures resulting in adverse judicial decisions. In addition, substantial uncertainty has emerged as a result of a wide range of interpretations within the federal judiciary of patent law. At the present time, over fifty percent of patents contested at the circuit court level are invalidated, and the cost of defending such suits is prohibitive for a small firm. A return to a strong patent system is essential for a rebirth in innovation.

THESE SAME FEDERAL POLICIES FORCE CONCENTRATION OF INNOVATION INTO FEWER AND FEWER LARGE FIRMS.

Simultaneous with the decline in the formation of new innovative enterprises there has been a concurrent acquisition of existing small innovative companies by large corporations. The unfortunate trends in the above policy areas is forcing concentration:

. Those federal policies affecting capital acquisition, coupled with the U.S. corporate income tax rate structure, force rapidly expanding small businesses to seek big firms with capital resource in order to obtain expansion capital;

. Estate tax considerations force many small innovative firms to sell their companies to large public firms. The highly restrictive security exchange policies accent this problem.

. In some industries the regulatory burden is beyond the ability of small firms to handle, while in others it is a major deterrent to creativity;

. In federal procurement, small firms (even those with outstanding products) cannot compete with large companies that specialize in this market;

. The weakened patent system forces the small patent holder into litigation with expenses so great that the small business cannot protect its rights against larger infringers, including government.

In order to aquire capital to meet expansion needs; to avoid high estate taxes; to obtain federal regulatory permits; to sell a new product to the government; or to defend it's patents, it is frequently necessary for the small innovative firm to sell out to a larger firm with greater resources. When this occurs, the research and development budgets are often soon cut and the innovative entrepreneurs leave the firm. A creative independent organization is changed into a static dependent one.

* * *

SOME GENERAL CONCLUSIONS

1. Technological innovation is essential to control inflation. And, it is essential if we are to fill our pressing social and human needs.

2. Independent entrepreneurs and their small businesses have made a disproportionately large contribution to anti-inflationary innovation. Unfortunately, small business creativity is blocked by a wide array of federal policies.

3. A renaissance in innovation is possible. The removal of unintended government inhibitors would allow small businesses to innovate again.

4. A fundamental reason for the decline in innovation is the failure of federal policy-makers and administrators to recognize the contributions from small firms to technological innovation, and their failure to recognize that small innovative firms cannot accomodate the burdens of government as readily as large companies. The burden of government upon small innovators is disproportionately large and often overwhelming. Government policies and regulations that treat large and small firms equally are, in fact, discriminatory against small firms.

5. When government recognizes the destructive nature of this disproportionate and overwhelming burden upon the small innovator, and when sufficient amendments to domestic policies are accomplished to allow relief, a major renaissance in anti-inflationary innovation will emerge in America with concomitant social and economic growth. For this to occur, a major departure is necessary from current federal policies affecting small businesses in capital acquisition, regulation, R & D funding, procurement, and patents.

Specific recommendations follow for each of these policy areas.

* * *

CAPITAL AVAILABILITY AND RETENTION

An essential ingredient for innovation is capital, and the lack of seed, start-up and expansion capital is probably the major factor throttling innovation by small businesses. Unfortunately, significant changes have occurred in tax laws, security exchange regulations, and federally mandated pension fund management policies during the past decade that have drastically reduced the flow of capital into new innovative businesses.

THE CAPITAL ALLOCATION PROCESS FOR SMALL BUSINESS INNOVATION IS SIGNIFICANTLY DIFFERENT THAN FOR BIG CORPORATIONS.

Innovation in large corporations is largely financed from the flow of earnings from mature products, and in many cases, sophisticated rate-of-return analyses are used to allocate this cash flow into promising areas of research, product development, and facility expansion. In addition, the profitable corporation receives an immediate income-tax benefit of approximately fifty percent for research and innovation related expenses, and a ten percent tax credit for related capital expenditures.

In contrast, the small independent innovator without a cash flow from one or more mature products must usually acquire his capital from external sources, often in several increments. No tax credits are available to the independent innovator until his new product becomes profitable. The net effect is that the small guy must raise from outside sources more than twice the amount of capital for the same innovation as a large corporation.

The disparity between the small business and the large corporation is further increased since debt capital is unavailable to the small firm to finance innovation, at least not until first profitability for the new product occurs. While debt is an important source of capital for large corporations, it is less available to small firms.

Furthermore, during the capital intensive stage of early and rapid expansion where initial profitability occurs, the high corporate income tax rate structure prevents the small firm from accumulating sufficient retained earnings to finance the internal expansion of its new product. In order to expand and protect its new market successes, the small enterprise must often turn to outside sources for capital. In contrast, the large corporation with mature business lines is usually able to supply all stages of capital from earnings of existing products.

In acquiring capital for each stage of innovation--seed, start-up and expansion--the federal tax code adversely and substantially discriminates against the small creative business.

FEDERAL SECURITY POLICIES ALSO DISCRIMINATE AGAINST INNOVATION.

The rules of the Security Exchange Commission that are established to prevent investment fraud, act to exclude from capital markets small innovative enterprises that do not have a proven flow of earnings from mature products. The registration and reporting requirements of the SEC are prohibitively costly to the small enterprise. In essence, the SEC is doing its job of preventing fraud by preventing all types of small businesses--both good and bad--from access to public markets.

Large corporations can afford access to public capital markets but small innovative firms are virtually excluded.

FEDERAL TAX LAWS DISCOURAGE INDIVIDUAL INVESTORS FROM MAKING INNOVATIVE INVESTMENTS.

Individual investors in the towns and cities across America in the past have played an important role in providing seed, start-up and expansion capital for innovation. In many (if not most) cases of significant innovation individual investors have been the only source of seed capital for the independent innovator to move from concepts into practical realities.

Unfortunately, changes in tax policies over the past ten years now favor areas for investment for individual investors other than innovation. Retirement funding, real estate, oil and gas drilling, and agriculture receive favorable tax treatment while innovation does not. We do not believe that real estate speculation and cattle feed lots are as important to healthy economic growth as is technological innovation--yet real estate and cattle feeding are favored and innovation is not. Innovation cannot compete for capital with these activities that are favored in the tax code.

Of additional concern to us are federal policies that encourage retirement funding. In 1970, legislation was passed to encourage retirement savings by providing tax-sheltered Individual Retirement Account (IRA) and Keogh plans so that the savings of doctors, lawyers, businessmen, and others with high income would be channeled into professionally managed institutional investment pools. In 1973, pension fund management policy legislation (ERISA) was passed requiring that such pools be managed by a "prudent man rule" that essentially precludes the use of this savings flow for small innovative businesses. Where prior to 1970 a substantial supply of savings throughout America was available for local enterprising inventors and entrepreneurs, this flow of savings is now diverted into tax sheltered centralized institutional investment pools that are precluded by law from investing in local promising ventures.

This combination of IRA-Keogh-ERISA acts like a huge vacuum sweeper moving around the country extracting innovative capital and placing it into large centralized funds where it is invested in the securities of governments, in large corporations, and into real estate. Hundreds of billions of dollars have been removed from local discretionary investments and locked up. In our opinion, this tax code induced removal of local discretionary investment decision making has caused a major disaster for innovation. This shift ininvestment decision making has been particularly disastrous for high-risk seed capital needs where ideas are first reduced to realities by using funds provided by friends, relatives, and personal acquaintances of the inventor on the local scene.

SPECIAL CONSIDERATIONS FOR SMALL INNOVATIVE BUSINESSES ARE NECESSARY.

It is our opinion that large amounts of risk-capital will again flow into small innovative businesses if federal tax laws are changed to put small business innovation at a parity with large corporations--and

at a parity with other investment alternatives for independent individual investors. Without such parity discrimination is occurring where small businesses cannot compete for capital for innovation.

Special considerations are necessary for our highly innovative sector of the economy and an amended tax code, changes in SEC policies, and revised ERISA rules are essential for the stimulation of a badly needed renaissance in anti-inflation innovation. It is the opinion of the members of this Committee that the following recommendations should be undertaken:

RECOMMENDATION # 1--CHANGES IN THE FEDERAL TAX CODE.

. A new class of equity security be created for start-up innovative businesses that would couple the benefits of limited partnerships with the benefits of Sub-chapter "S" Corporations. This new equity class would possess the following features;

--limited liability protection,

--include up to one hundred investors,

--allow corporated investors,

--allow the use of cash basis accounting for tax determinations,

--allow operating losses and investment tax credits to flow through to individual funding investors in the year occurred,

--allow specialized equipment and instrumentation for research, development or testing to be expensed in the year purchased;

This new class of stock and its benefits should be availabe to small businesses that spend in excess of five percent of their gross sales revenues in research and development as determined by Generally Accepted Accounting Principals (GAAP).

. Allow investors in small science and technology based firms to defer paying capital gains taxes on equity investments, provided the gains are reinvested in other small science and technology based firms within two years;

. Reduce the federal tax on gains from capital investments in small science and technology firms to a level of fifty percent of the otherwise applicable capital gains rate, if the investment is held for a minimum of five years;

. Allow small science and technology firms to carry forward losses for a period of ten years instead of five years;

. Restore the Qualified Stock Option Plan for key employees in small science and technology firms, and establish the period for exercising stock options at ten years;

. Provide for a twenty-five percent tax credit for research and development related expenditures by small businesses (as currently allowed in Canada);

. Revise the corporate income tax rate to provide greater retention of earnings during the initial start-up and growth phases for small science and technology firms;

. Allow small business concerns to establish and retain a "reserve for research and development" in profitable years to be used in periods of business stress, with the maximum level of this reserve being ten percent of gross revenues;

. Treat license royalites as capital gains instead of ordinary income;

. Eliminate the existing tax liabilities for overseas joint ventures in which the small business investment consists of a contribution of know how and technical information;

. Permit small businesses to take double deductions of expenses directly related to export market development;

RECOMMENDATION # 2--CHANGES IN INVESTMENT MANAGEMENT POLICIES.

. Modify ERISA to allow up to five percent of pension fund portfolios to be invested in small businesses;

. Encourage state investment pools to invest a larger percentage of their holdings in small innovative businesses.

RECOMMENDATION # 3--CHANGES IN SECURITY EXCHANGE LAWS AND REGULATIONS.

. Exempt from SEC registration offerings of equity securities for innovative businesses outlined in Recommendation # 1 of less than two million dollars;

. Change the charter of the Security Exchange Commission to specify the encouragement of the flow of capital into small innovative enterprises as well as to protect the public investor.

The objective of these first three recommendations is to remove unintended obstacles that have arisen and to provide incentives for the allocation of seed, start-up, and expansion capital to promising innovative ventures, by:

. Providing tax parity for small innovative firms equal to that of large corporations;

. Providing tax parity for investments in innovation equal to that provided for alternate investment opportunities for independent investors;

. Allowing greater retention of retained earnings for early expansion;

. Removing SEC discrimination;

. Releasing locked-up capital in retirement funds.

We believe that the loss in tax revenues from these recommendations will be miniscule when compared to increased tax revenues to be received within several years of enacting these changes. The tax umbrella that would be provided for stimulating small business innovation would not be applicable to the large earning flows for large mature corporations nor would they be available for non-innovative individual investments. While we appreciate that our recommendations might result in some compromises in investor protection against fraud and losses, and that there may be some problems of definition and of administrative convenience, we believe that these costs will be minor compared to the overall societal benefits resulting from the rebirth in anti-inflation innovation that would follow.

* * *

REGULATION.

During the past decade, a new regulatory environment has emerged to fulfill a wide variety of social "mandates". This environment includes new agencies such as OSHA, EPA, CPSC, NTSB and EEOC, in addition to expanded jurisdictions of existing agencies such as FDA, SEC, FTC, DOE, DOT, Justice, Corps of Engineers and others involved in the regulation of business in one way or another. We believe that the mission of each of these agencies is well intended and, if only one (or a few) of them were impacting upon small innovative businesses, their impact could be absorbed within the creative process. Unfortunately, for many small businesses there is mandatory involvement with a wide range of agencies and, in some cases, the laws and regulations being enforced were intended for large sources of hazards, or for some other purpose than to control the new field being pioneered by the innovator.

In some new fields, the regulatory environment is so intense and so diverse that the whole of this impact is greater than the sum of the parts. The small guy is overwhelmed by the law-making, rule-making, and enforcement processes of regulation. This intense diverse regulatory environment is contributing to inflation in two ways--by impeding innovation (particularly innovation in small enterprises)--and by adding significantly to business costs.

REGULATION IS A MAJOR DETERRENT ON THE CREATIVE PROCESS.

The overwhelming nature of widespread regulation results in an adverse interference with the innovative process, pushing the balance away from success. The innovator's most precious assets of time and energy are drained. Expensive delays are experienced, and the creative entrepreneur and his scientists and engineers are kept on the defensive--not on the offensive that is necessary for their success.

In addition to regulations contributing to inflation, a serious consequence of this new regulatory environment is that economic progress is distorted in favor of those fields where government involvement is minimal and where innovation can occur relatively untrammled. In those fields where regulation is diverse and intense, greatly reduced entrepre-neural activities are experience, and only those innovators who can map and navigate the governmental process can succeed.

The costs of regulation to the innovative process in small business are large and real.

GOVERNMENT FAILS TO RECOGNIZE THE DISPROPORTIONATELY HEAVY IMPACT OF THE REGULATORY PROCESS UPON SMALL BUSINESS INNOVATION.

When approaching government, the small businessman often encounters a presumption of harm and dishonesty, or at best, indifference, and not a sympathetic understanding of the peculiar needs and problems of the small guy attempting to be creative. The legislative and rule-making processes are impossible forums for his participation and his bureaucratic adversaries have substantially greater influence and credibility in these processes. Laws, rules, policies and procedures often are made for "administrative convenience", and such administrative conveniences usually become an inconvenience for the innovator. As a society we must address the question of whose convenience is more important--the bureaucrat's or the innovator's?

During the 1970's, "due process of law" in American democracy has become an unfamiliar phenomenom to the small innovator--the process is closed to him--and grossly discrminates against him. This adversary regulatory process in America today has caused the remaining few small innovators to consider government as an alien power committed to their destruction.

The small innovative business cannot deal with this intense and diverse regulatory environemnt as readily as can the large corporation. If a re-birth of innovation is to occur, government must recognize this adverse discrimination and a major departure from current regulatory processes that affect small innovative businesses is necessary.

In view of this deleterious impact of federal regulation upon small business enterprises, and the serious consequences of inflation and stymied innovation, we wish to make the following recommendations:

RECOMMENDATION # 4--CHANGES IN REGULATORY POLICIES.

. A thorough revision of the regulations and operating procedures of OSHA as they relate to small innovative business to include:

--A general exemption from OSHA, except where the accident history of a particular industry or firm is substantially greater than average, and in such cases, the burden should be upon OSHA to justify action; and

--The prohibition of first instance citations except in extreme cases.

. In all regulatory activities, the burden should be placed upon each regulatory agency to establish a cause of concern before requiring regulatory compliance by a small business. Minimum levels of impact should be statutorily defined thereby exempting small businesses in all but extreme and justifiable cases.

. Substantial strengthening of the Regulatory Council to include:

--participation by the Small Business Administration;

--requiring all regulatory agencies to balance the risks of a hazard against the economic costs, with thorough consideration of specific impacts of proposed regulations upon small business creative processes;

--the use of "performance standards" and not "method standards" in those cases where regulatory standards are clearly justified;

--wherever possible, return to reliance upon standards associations with federally mandated standards being the last resort;

--improved congressional oversight of the regulatory process as it relates to small innovative businesses.

. Provide product liability and recall insurance at reasonable costs for small businesses, with exemptions from recalls except in the most extreme cases; and the establishment of statutory limits of liability for product failures similar to Workman's Compensation Insurance.

The OSHA problem is particularly serious for small innovative enterprises that have to deal with this agency, and a revision in OSHA policies and practices is necessary. Some members of our Committee believe that it would be in the best interest of workplace safety as well as of industrial innovation to eliminate OSHA entirely. Others agree, but believe that this may be politically impractical. Still others are of the opinion that government can improve workplace safety with the significant amendments to present policies and procedures that we are proposing.

The recently published report Making Prevention Pay by the Inner-Agency Taskforce on Workplace Safety and Health concludes that OSHA has failed to make an improvement in workplace safety during the past decade. And, it is clear to us that the burden of this program on small innovative businesses is discriminatory and highly adverse. In addition, OSHA is an agency that has generated an enormous amount of litigation, and in cases of appealed OSHA citations, over fifty percent have been vacated. Yet, litigation is not a form of relief for small innovative businesses--the OSHA rule-making and appeals process, and judiciary relief, is a costly and time consuming game that small enterprises cannot play. Therefore, the burdens of citations should not be placed upon small businesses, at least in the first instance, and we urge that the burden be placed upon government to demonstrate on a case by case basis that unusually great hazards exist before OSHA can exercise jurisdiction in the case of small businesses.

In most other areas of regulation, it is our opinion that the burden of compliance for small business enterprises should be substantially reduced, and in many cases can be eliminated without materially compromising the overall objectives of the subject regulation. It is virtually impossible for the struggling innovator to comply with the never ending forms, mandated reports, applications, investigations, inspections, permits, licenses, standards, variances, checklists, guidelines, plans, study-sessions, pubic meetings, rule-makings, non-rule makings, hearings, non-hearings, burdens of proof, appeals, etc., and to accomodate the rapidly growing enforcement budgets at all levels of government to "make businesses comply." The language of government is a strange tongue written by lawyers for judges that is as incomprehensible to the small innovator as is the regulatory process itself. This government problem is more than simply a paperwork blitz--it is a major consumer of time, energy, and capital, and is sometimes absolutely prohibitive.

We believe that it is essential that a clearly specified level of impact or hazard exposure be established before a business is regulated, to allow the entrepreneur to innovate without the burden of regulation consuming his precious time, drive and capital, and in causing inordinate delays for him to learn the appropriate rules, accomplish their compliance, and obtain appropriate permits. The burden is particularly onerous upon the innovating entrepreneur attempting to do something new since most existing laws are intended to eliminate some other form of evil.

The new regulatory environment is another example of how government polices unfairly discriminate against small innovative firms by treating them the same as big corpoations. Some big corporations can survive in this regulatory game--they can enter law making and rule making procedures, retain experts to ply the most subtle interpretations of the rules, and can afford the time and costs of appeals and litigations, etc.,--the small guys simply cannot because "the due process" is too time consuming, costly, and technically overbearing. If the small guy tries, the balance in his struggle for survival weighs heavily towards failure. Therefore, we strongly believe that reasonable exemptions are necessary for small firms if our sector of the economy is to be revitalized as a major source of non-inflationary innovation.

* * *

DIRECT FUNDING OF R & D BY THE FEDERAL GOVERNMENT.

Economists consistently state that technological innovation is the principle contributor to U.S. economic power and is necessary in order to continue to advance our standard of living. And research and development is one of the critical ingredients of innovation. Economists also state that the social return on R & D is high with some estimating it to be twice the private return. For these reasons, together with the anti-inflationary impact of innovation, we believe that it is important to increase our national investment in R & D.

FEDERAL SUPPORT FOR R & D HAS DECLINED AND HAS BECOME CONCENTRATED.

While we believe it is important to increase our national investment in R & D, this investment, as a percentage of Gross National Product (GNP), has been declining since 1968, while that of some countries (Japan in particular) has continued to rise. One-half of our R & D investment is privately financed and one-half is from federal sources; with one-half the federal R & D being for defense. While industrial R & D expenditures have held their own as a percentage of GNP during the last twenty years, government R & D has not kept up with the growth in GNP. In the federal area, small business receives only three and one-half percent of federal R & D expenditures.

Of additional concern to us is that four agencies--defense, space, energy, and HEW--fund eighty-eight percent of federal R & D. Similarly, there is a concentration of U.S. industrial R & D into a few industries and into a few companies. According to Science Indicators, 1976, six industries account for eight-five percent of total U.S. industrial R & D. Ten companies do thirty-six percent, and thirty-one do over sixty-percent. Greater than eighty percent of industry's R & D is carried out by only two hundred firms.

We believe that this concentration of private R & D into a few large firms is not in our national interest. While there is such a great concentration of private R & D, it is small business that has accounted for one-half of our total major innovations over the past twenty years and it did so while conducting only three percent of the total U.S. R & D. This is a powerful testimony for the contributions and effectiveness of small innovative businesses. Science Indicators also reports that during the twenty year period from 1953 to 1973, small businesses contributed twenty-four times the number of major innovations per dollar of R & D as did large firms. In addition, the total cost for maintaining a scientist or engineer in R & D for a small business has averaged one-half of that for large firms. It is further reported that inventors in universities contributed far less frequently.

In view of these facts, we must ask why so much of our federal R & D is awarded to large firms, federal laboratories and universities, and so little to small business since technological innovation is critical to our social-economic progress. We believe that a larger share of federally funded R & D awarded to small businesses would produce substantially greater results.

REVISED INCENTIVES WILL STIMULATE PRIVATE INNOVATION.

One of the critical obstacles to more productive R & D funding is the lack of recognition within government that innovation usually does not result from research findings without proper incentives to put these findings to work. The objective pursued by most federal R & D recepients is to meet the precise specifications required by the government and not to pursue innovative ideas and commercialization of results. This requirement to pursue narrow objectives prevents innovation. In universities the incentive is to uncover new knowlege and to publish these findings in scientific journals--not to produce innovations for commercialization in the private sector.

Sometimes federally funded applied R & D in universities and government laboratories is aimed at preventing a private firm from gaining a technological lead, or in duplicating private technological successes with the objective of public disclosure. Such competition with the private sector, particularly with small firms, is a substantial disincentive to the innovator and to his sources of capital.

We believe that greater private sector utilization of scientific knowledge generated by federally funded research is desireable, and commend the Small Business Innovation Program of the National Science Foundation as a successful model. This imaginative program is directed specifically at converting research on federal objectives into innovation in the private sector. It provides incentives for the small science and technology based firm, venture capital firms, private investors, large companies and universities to work together to explore and finance advanced concepts leading to new products, processes and services. This program provides strong incentives for the utilization of science to do new things.

The members of our Committee believe that it is essential that governmental policy-makers concerned with innovation make better utilization of incentives for the commercialization of research knowledge. We also believe that government must take steps to assure that the disincentives to private initative of deliberate pre-emptive and duplicatory work, and competition with the private sector at universities or government laboratories be prohibited, and that steps be taken to ensure that this prohibition is enforced.

AN ADVANCING SCIENTIFIC ENVIRONMENT IS ESSENTIAL FOR INNOVATION.

The final concern of the Committee is the health of science in America. U.S. science clearly leads the world with fifty percent of the total science based Nobel prizes during the past thirty years. While this science excellence has existed since World War II, the industrial competitiveness of U.S. technology has declined, and much of the benefits of our excellence in science has been transfered overseas. We have received little in return, except that we now import large amounts of foreign goods made possible by our scientific advancements. We must point out that small business does not establish and train our overseas technological competitors--small innovative businesses create jobs, income, and exports at home.

We must also comment upon what we believe to be an unhealthy mix of basic and applied research at our universities that is mandated by federal funding requirements. We support the principal that universities are a proper environment for much of our basic research. However, government support to universities for applied research has increased more than six times during the past twenty years, while industry's percentage has declined from approximately fifty percent to twenty percent.

Federal laboratories and non-profit institutions have also prospered in applied research funding. We must respectfully point out, however, that major innovations have not come out of our universities, federal laboratories, and non-profit institutions with a frequency comparable to those emanating from small businesses. We must again ask why we do not have more applied research conducted by small businesses.

While some individuals may claim that applied research in universities is necessary to train an increasing number of scientists and engineers, a 1979 Department of Labor report states that forty-seven percent of those who received doctorates between 1970 and 1977 were not able to get jobs in fields that required that level of education, and that this problem is projected to persist through 1985.

In summary, the Committee believes that there is a need to increase federal R & D expenditures and that this increase should go in new directions.

RECOMMENDATION # 5--CHANGES IN POLICIES FOR FEDERAL FUNDING OF R & D

. The decline in R & D expenditures as a percentage of Gross National Product must be arrested and re-directed upwards towards the goal of three percent by 1985.

. This increase should be heavily directed towards basic research at universities and applied research and development in the private sector, with strong incentives for commercialization.

. There should be decreased emphasis on applied research in universities, federal laboratories and non-profit institutions, particularly where such applied work might pre-empt private initiative or is duplicatory or competitive with private sector activities.

. Each federal agency should be directed to allocate at least ten percent of its R & D budgets to small business and increase current levels by one percent of its budget each year until the ten percent minimum is established, starting in 1980.

. Each year, starting in 1980, each agency with a budget of over $100 million for R & D should allocate at least one percent of its R & D budget to the small business program using the same format as that of the National Science Foundation but with their own research topics, and review and awards procedures. This program should be coordinated by an Inner-Agency Small Business R & D Committee chaired by the Small Business Administration.

. A clear federal policy should be established and enforced to prohibit federal funds from being used to finance projects that are competitive with or duplicatory of private sector technological developments, or in any other ways might prevent the establishment by small businesses of exclusive technological or intellectual properties in new areas of non-defense technological advancement.

* * *

FEDERAL PROCUREMENT POLICIES.

The U.S. government is the largest purchaser of goods and services in the world. Federal procurement policies greatly affect the ability and incentives for government contractors to innovate.

Unfortunately, federal procurement rules and their administration are grossly discriminatory against small businesses. Large corporations

are able to follow changing trends well in advance in procurement and to influence specifications to favor their companies. They know the system, can handle it, and can afford large government marketing staffs to effectively compete. Small businesses, which have historically provided fifty percent of the most significant innovations, are essentially precluded from this process. We do not believe this is in the national interest. Small businesses need a greater opportunity to participate.

At present, the federal procurement system chews the small innovator to bits. The small firm has little negotiating power and cases of unfair discriminatory treatment against small innovative businesses are legion. For example, patent policies in some agencies result in patent rights being awarded to large contractors, yet small firms rarely are able to obtain patent rights under similar circumstances. In addition there are cases where patent rights developed at the expense of a small business have been required to be assigned to the government for use by others as a condition of the small firm obtaining a government contract.

Small businesses are further discriminated against in government payment procedures. Delays occur in receiving payments and the small business is less able to obtain low cost loans to carry overdue government receivables. In addition, debt service is not a reimbursable cost.

It is the opinion of this Committee that changes should be initated in procurement policies in order to encourage and allow greater participation by small innovative businesses on a more equitable basis.

RECOMMENDATION # 6--CHANGES IN FEDERAL PROCUREMENT POLICIES.

. Cost sharing requirements for research and development awards for small businesses shall be eliminated and negotiated, fees shall be allowed on all R & D awards;

. No federal agency shall exclude small business from a fair and equitable opportunity to compete on a merit basis on the same terms as other participants;

. No agency shall restrict opportunities for small businesses to submit unsolicited proposals and shall give such proposals a fair review based upon their merit. Each agency shall provide small firms opportunities to receive sole source awards;

. Independent research and development costs, and bid and proposal costs, shall be allowable costs for small business firms at a rate for small businesses of at least two times the level allowed for large businesses.

. A separate set of simplified Federal Acquisition Regulations should be developed to apply to small business firms;

. All proposals submitted by small business must be awarded or declined within four months of submission;

. Proposal evaluations shall consider total costs relative to the work proposed, and not consider overhead or indirect cost rates due to variations in institutional and company accounting practicies;

. Fee negotiations shall take into consideration the level of interest rates and shall be higher in times of high interest rates than in times of low interest rates. All debt service costs shall be allowable costs for small businesses, and procedures should be instituted for prompt payments to small businesses, with late payment penalties;

. Every federal agency should study policies and procedures that discriminate against small businesses, and to institute changes that will equalize opportunity without harming the public interest.

* * *

PATENTS.

OUR PATENT SYSTEM HAS WEAKENED.

It is with alarm and consternation that we report two major weaknesses that have emerged in the patent system in recent years that are damaging incentives for innovation, particularly by small science and technology businesses. The usefullness of patents has diminished dramatically.

The first weakness is that judicial decisions, at the trial court level, are resulting in fifty percent of the patents issued by the U.S. Patent and Trademark Office being declared invalid when contested. In the ten circuit courts of appeal, this figure becomes seventy-two percent. As a result, the innovator seeking patent protection is inviting expensive litigation to test the validity of his patent, and the odds greatly favor his potential competitor, often a resourceful large corporation wishing to use his technology. A basic reason for such judicial invalidities is that the Patent Office did not have available to it, or was unable to identify, or failed to use, prior art that the courts declare as pre-emptive.

The second major weakness is that the cost incurred in defensive patent litigation sometimes approximates $250,000, which is usually an impossible burden for a small business. These developments are inhibiting to innovation and place the small innovative business in a position of not being able to benefit from the patent protection to which it is entitled and that may be necessary for its success.

It must be recognized that the reliability of patents is the keystone in the commitment of funds to carry out the commercialization of a patented (or potentially patentable) invention. Few entrepreneurs and investors are willing to risk time, energy and funds in the com-

mercialization of an invention in a free market economy knowing that the path they are pioneering may soon be trod upon by others, including large firms with greater resources and with preferential access to the market for the new invention. As a result, the only legal method to protect newly pioneered technology is by maintaining new technology as a trade secret. Tying up significant discoveries and inventions in trade secrets is not in the public interest since knowledge transfer does not occur for others to use.

OTHER GOVERNMENT AGENCIES FAIL TO RECOGNIZE THE NECESSITY OF INITIAL EXCLUSIVITY FOR SUCCESSFUL INNOVATION.

Although our constiutionally provided federal patent system is intended to provide exclusive protection to inventors with novel contributions, the importance of this policy of exclusivity is frequently ignored by government. We believe that a change in attitude within government about exclusivity of technology by small business would substantially enhance innovation. Small firms pioneering new techniques are often treated as large resourceful corporations attempting to monopolize markets. In some cases government vigorously attempts to pre-empt or duplicate technology being pioneered by small firms in order to prevent initial exclusivity. The result is that in such fields where government R & D activities are pre-emptive or competitive, interest by entrepreneurs and risk capital sources diminishes. This Committee believes that there must be a greater awareness within government that exclusivity is frequently a substantial motivation in decisions to pioneer new fields.

It is unfortunate that the benefits of patent protection of inital exclusiviety have greatly diminished for small businesses and this trend favors large resourceful corporations that can afford expensive litigation. It is the small innovative businesses that make a far greater contribution to innovation in America that are being deprived of the protection necessary for them to become established. We therefore have the following recommendations for strengthening incentives for innovation provided by the patent system:

RECOMMENDATION # 7--CHANGES IN PATENT POLICIES.

. The Patent and Trademark Office should develop a practical and effective computer based search and retrieval system for its own use and public access, with particular concern for its usefullness for small business firms.

. A new mandatory re-examination procedure should be instituted in the Patent and Trademark Office whereby a litigant who raises a defense of invalidity of a patent based on new found heretofore unconsidered art should first test the assertion of invalidity in the patent office where the most expert opinions exist at a much reduced cost.

. The budget of the patent office should be increased sufficiently to allow for more thorough searching of prior art using the most modern search technology.

.The patent laws should be amended to recognize that the reliability of patents is a keystone in the commitment of funds to carry out commercializations of patented inventions, and incontestability should be mandated after a period of time so as to result in absolute reliability, except in cases of fraud.

. Legislation should be passed to give small businesses title to inventions made under government contracts, with the provision that commercialization be undertaken in a reasonable time. If such commercialization is not undertaken, title should revert to the government and the government should license small businesses. As an alternative, small business should be able to obtain title to inventions developed under government awards if they invest an amount of capital at least equal to the amount of the R & D award under which the invention occurred. Likewise, with inventions made in national laboratories, the government should preferentially license small business concerns.

. Small businesses should be able to obtain (with appropriate restrictions) compulsory licenses through suitable proceedings in cases where uncommercialized patents block entry into new markets.

. The Justice Department should be required to undertake competitive impact studies for taking anti-trust action against small business when a small business is attempting to exploit the full property rights afforded by its patent.

* * *

This report is only a brief compilation of the recommendations that we believe are important to lead to a renaissance in anti-inflationary technological innovation by small business enterprises. We hope that we have articulated the distinctive characteristics of the creative process in small businesses that are substantially different than the creative processes in large corporations. In most cases, the same government regulations, policies and processes applied to all businesses, in effect, discriminate against small innovative businesses.

The necessary exemptions and the special needs of small innovative businesses are usually discarded by federal policy makers because it is feared that they will be applied to all industry. Yet we believe that special considerations are usefull and tolerable if restricted by ceilings to levels meaningful to our sector of the American innovative community.

The issue of special treatment for small innovative enterprises in the formulation of laws, policies and governmental processes, is more than a matter of equity--it is a matter of national concern because of the far reaching ramifications of innovation in economic and social growth and the disproportionately large contributions of independent innovators. The potential for continued innovative contributions from small business is far too great to continue to be ignored, and meaningful special considerations must be made.

With the removal of the disincentives that are now imposed upon small innovative businesses, we are confident that the amazing resourcefullness of American innovators will again emerge and result in material social and economic growth for our country.

APPENDIX II

A Report to the Assistant Secretary of Commerce for Science and Technology

Commerce Work Group on Job Creation

RECOMMENDATIONS FOR CREATING JOBS THROUGH THE SUCCESS OF SMALL, INNOVATIVE BUSINESSES

A Report to the Assistant Secretary of Commerce

for Science and Technology

This report, prepared under the direction of William C. Norris, Chairman of the Board and Chief Executive Officer of Control Data Corporation and a member of the Commerce Technical Advisory Board, represents the views of a Work Group of private citizens, each of whom has had unique and valuable experience in technology and entrepreneurship.

December, 1978

EXECUTIVE SUMMARY

Job shortage in the United States is the most important consequence of our recent decline in technological innovation. Jobs are at the heart of American society, but we don't have enough of them, and we aren't creating new ones fast enough, particularly skilled jobs.

The shortage of jobs underlies our blighted inner cities and proverty stricken rural areas where residents, reliant on welfare, are bereft of the means to regain control of their personal lives to rise above the squalor. It also underlies the unemployment rate of nearly 35 percent for minority teenagers. This means a paucity of career opportunities that will attract their commitment to self-improvement programs as realistic alternatives to lives dominated by despair, desolation, and crime.

The ability of our economy to carry out technological innovation -- to introduce commercially successful new products, services, and processes -- is the foundation of both our domestic prosperity and our international competitiveness. Because innovation is such a key factor in our economy, it supports much of our real economic growth, which in turn permits a rising standard of living and provides a solution to the stubborn problem of stagflation -- rising prices combined with high unemployment.

Internationally, our historic preeminence in technological innovation is being challenged by other industrial nations, Japan and West Germany in particular. The challenge is explicit. It is shown clearly by recent trends in several international economic indicators -- the falling value of the dollar, our declining share of world exports, and our negative trade balances in manufactured goods. Continuation of these trends promises the loss of U.S. leadership in technological innovation and a further deterioration of our economic health.

Given their brilliant performance of the 50's and 60's small businesses* again could play a major role in providing more jobs and

* Throughout this report small businesses are defined as those that have less than 500 employees, are not majority owned by larger firms, are operated for profit, and are involved in the creation or creative use of new knowledge, products, processes, or services. Activities related primarily to real estate transactions are excluded.

make significant contributions to the solutions of the underlying problems of our economy. The performance of the small business sector could be stimulated to provide these benefits by changes in federal policy and commercial practices and without increases in federal budget support. Whatever early losses in federal revenues they may cause are expected to be offset by subsequent gains from the resulting spurt in economic activity.

Throughout most of our history, small enterprises have produced many of our best jobs; a large proportion of the new products and services that have made us the world's leading nation in science, engineering, and technology; and a steady supply of creative entrepreneurs. But the contributions of small firms have sharply declined over the last decade. We believe the underlying causes are mainly certain growth-inhibiting government policies.

One is the increase in capital gains taxation, which has greatly reduced the availability of capital for small businesses. Another is increased regulatory barriers inhibiting the access of small firms to the capital market. A third is the continuing concentration of research and development effort in a few industries and in relatively few firms within those industries, and little incentive to diffuse technologies.

Increased technological innovation appropriate to the small family farm and food processor is also needed. Rising costs of energy, plateauing productivity of major food crops, increasing scarcity of water, continuing high levels of pollution, and decreasing fertility from erosion mandate that small farms and food processors also be made significant and lower-cost contributors to the nation's food supply.

The overall objectives of the recommendations in this report are:

1. To assure that the small enterprises regain their previous economic vitality, and

2. To foster the viability of the small family farm and small food processor through development and application of technologies that require less capital and fossil fuel, and are more conserving of other natural resources.

The following 12 recommendations are directed to changes in federal policies and commercial practices in five categories:

- Increasing the availability of capital and management expertise in small businesses (Recommendations 1-5).

- Reducing the burden on small businesses of compliance with government regulations (Recommendation 6).

- Stimulating the diffusion to and more effective application by small businesses of the technology developed in government laboratories and large businesses (Recommendations 7 and 8).

- Increasing the amount of R&D performed by small businesses and its utility to small farms and food processors (Recommendations 9, 10, and 11).

- Stimulating the export performance of small businesses (Recommendation 12).

While we recognize the potential significance to small businesses of issues relating to the U.S. patent system and federal patent policy, we exclude recommendations for policy changes in this area because it is under active review by the Domestic Policy Review on Industrial Innovation and by the Committee on Intellectual Property and Information of the Federal Coordinating Council for Science, Engineering, and Technology.

The complete text of each recommendation follows:

Recommendation 1.

We recommend that the capital gains tax rate be reduced to 25 percent (the pre-1969 rate) on the capital gains realized from the sales of stocks of small businesses (less than 500 employees at date of purchase) whenever such stocks have been held for more than three years, with a rate of 10 percent for the capital gains of investors in the smallest businesses (less than 100 employees at date of purchase). The reduced rates would not apply to capital gains realized from the sale of real estate. (Pages 15-18)

Recommendation 2.

We recommend deferral of capital gains taxes on the sales of stock if the proceeds are reinvested within one year in small businesses, except those whose principal activities are real estate transactions. (Pages 18-19)

Recommendation 3.

We recommend that the threshold for application of the full corporate tax rate of 46% be raised for small businesses from $100,000 to $200,000 of annual net income; and for annual net income below $200,000 a progressive rate schedule beginning at 10% on the first $50,000, and increasing in 10% increments to $200,000 on each additional $50,000. In addition we recommend that the carry-forward provisions for start-up losses of small businesses be extended from five to ten years. (Pages 19-20)

Recommendation 4.

We recommend restoration of the Qualified Stock Option Plan for Key Employees of small businesses. (Pages 20-21)

Recommendation 5.

We recommend (1) that ERISA's prudent man standard be restated so that it is clearly applicable to the total portfolio of pension fund investments rather than individual investments, and (2) that pension fund managers explicitly be permitted to invest up to five percent of pension fund assets in small firms. (Page 21)

Recommendation 6.

We recommend that small businesses be allowed to deduct twice their payments for regulatory advisory services related to compliance with federal, state, and local regulation. (Pages 22-23)

Recommendation 7.

We recommend that each federal agency allocate five percent of its R&D funds for technology transfer. These funds should be used to establish well defined and organized programs of technology transfer

in which there are incentives to individual researchers to contribute their time and skills to the identification of commercial applications. Such incentives should be related to the benefits realized from technology transfer. (Pages 23-26)

Recommendation 8.

We recommend that private sector individual or corporate owners of technology be rewarded, through appropriate changes in the tax code, for selling, leasing, or licensing their technology to small business firms in the United States. In addition, we recommend the establishment of a voluntary national policy to encourage companies to make their technologies available for uses by others. (Pages 26-27)

Recommendation 9.

We recommend that each federal agency receiving R&D funds by appropriation from the Congress be required to allocate at least 10 percent of all such funds (excluding those for basic research) to small businesses and that this objective be achieved in annual one percent increments beginning in FY1980. (Pages 27-30)

Recommendation 10.

We recommend that small business firms be allowed to establish and maintain a reserve for R&D for use in times of financial stress. (Pages 30-31)

Recommendation 11.

We recommend that there be some redirection of federally supported agricultural research to the development of technology for improving the efficiency of small family farms and food processors and for making food production, transportation, and preservation less capital and fossil-fuel intensive. (Pages 31-33)

Recommendation 12.

We recommend that the creation of Small Business Export Trade Corporations be encouraged by a double deduction for these corporations of up to $100,000 of annual expenses associated with the exporting activities of each client, with a loss carry-forward of ten years. In addition, we recommend that small businesses be allowed a double deduction of special expenses of serving export markets up to $100,000 annually. (Pages 33-34)

CONTENTS

LIST OF FIGURES

I. INTRODUCTION

This report recommends changes in federal policies to increase the contributions of small, technologically innovative firms to our society. We define such firms as those that have less than 500 employees, are not majority owned by larger firms, are operated for profit, and are involved in the creation or creative use of new knowledge, products, processes, or services. We exclude throughout the report activities related primarily to real estate transactions.

The small business sector no longer contributes as much to economic prosperity as it so brilliantly did in the fifties and sixties. The loss is not just for the few that might have had the satisfaction of technological entrepreneurship; more importantly it is a loss for all Americans who would have shared in the abundant economic benefits and would have held the myriad of skilled jobs that such pioneering would have made possible.

More innovation means more skilled jobs for an increasingly educated population, an improved export performance, a higher rate of productivity improvement, and at least a partial solution to stagflation, a crippling combination of inflation and unemployment. Further, we desperately need more innovation to cope with both new problems and widely accepted national goals - - better central cities, safer and more satisfying work, a cleaner environment, and less dependence upon autocratically controlled overseas sources of energy supplies. We need to recognize the growing concern over the quality of life in our country - - concern that technological innovation is not focusing adequately on both life's necessities of food and housing and on the amenities that make life more enjoyable. We think commercially successful innovation is like good health: a society can never have too much.

Our concerns span the entire spectrum of requirements for successful innovation - - from the inception of the research and development (R&D)[1] to the widespread use of a new product, process, or concept. We look then well beyond research and development (that is, activities to create new knowledge or design) to encompass the introduction and diffusion of an invention through its commercial application that creates jobs, increases productivity, and adds to exports. Thus successful innovation requires a combination of market demand (need), technical feasibility, and commitment of financial support. This combination ultimately is manifested in the establishment of all of the producing and marketing facilities required for national and international distribution of the product or service. Hence, our report deals not only with the role of scientist, engineer, and inventor, but also that of the financier, the production craftsman, and the marketing person; all are involved in bringing an invention into widespread use.

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[1]Research and development includes (1) basic research (acquiring scientific knowledge), (2) applied research (acquiring knowledge for potential application), and (3) development (designing special materials, devices, processes, and products).

We recognize that federal policies alone cannot cause small, technically oriented firms to flourish. Their existence depends on the entrepreneurial spirit that has been an integral part of our culture and institutions, and they have contributed importantly to our economic strength. Other industrialized countries do not have so large a sector of technically oriented small businesses, which explains in large part their historic lack in innovation. In recent years, however, they have recognized this deficiency and instituted policies to encourage the development of small technically oriented companies. At the same time, policy changes in the United States have had largely unintended adverse consequences.

Our recommendations are to reshape certain existing policies to make them less of a handicap to business, rather than to expand the government into new areas. We stress that our recommendations involve no increase in federal budgetary support, but they probably would cause an initial reduction in federal revenues.

The report is focused on what can be done: measures that will pay off to society. As a prelude to such recommendations, we believe it is important to review briefly what we regard as the present crisis in innovation and its consequences.

II. CONSEQUENCES OF THE SLOWDOWN IN INNOVATION

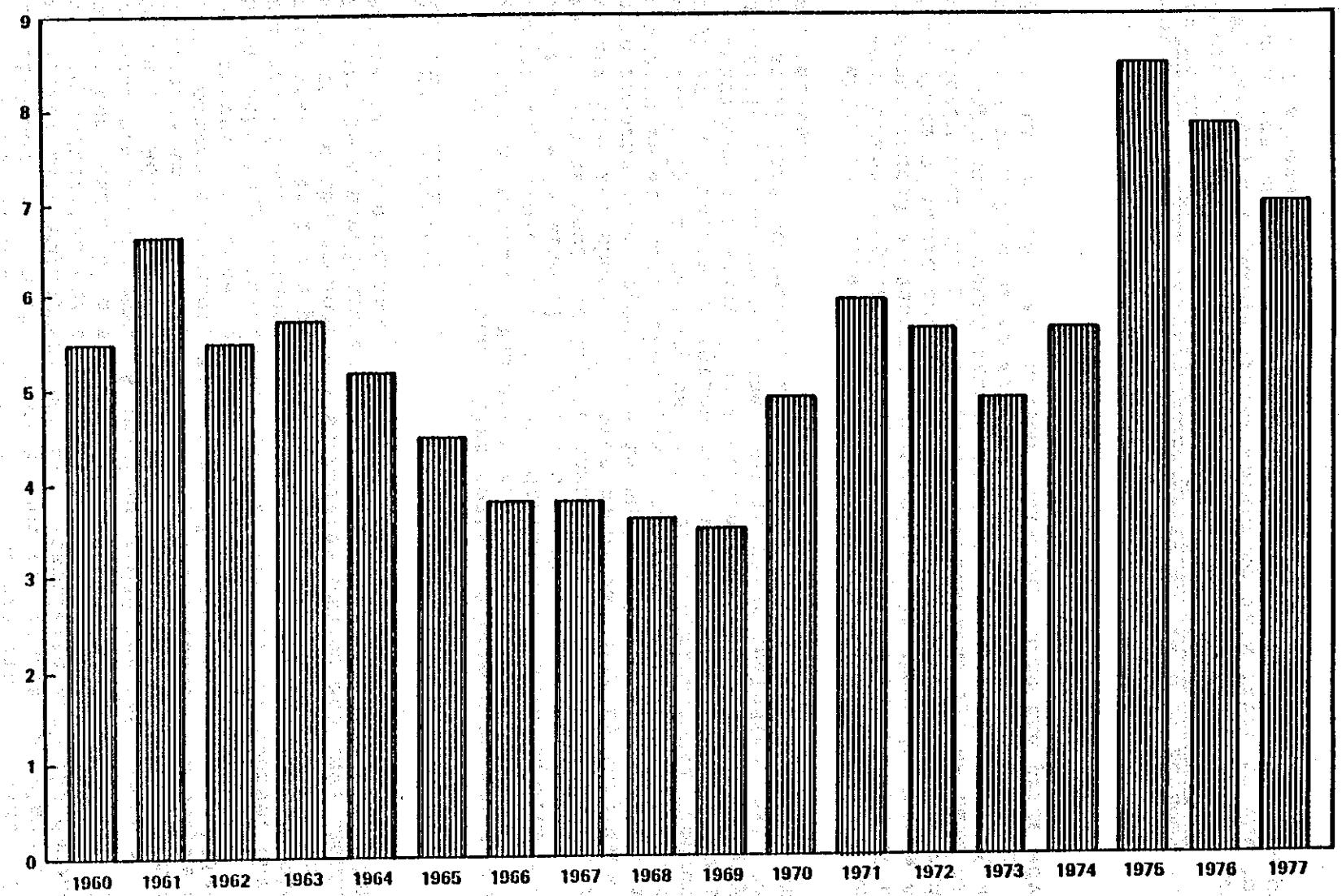
The loss of the potential contribution of the small, technically oriented firm and more generally the decline in innovation in our economy have wide-ranging ramifications for jobs in the United States, our trade position, our productivity, the general performance of our economy, and our ability to meet the new problems our society faces.

A. Jobs

Unemployment in the United States throughout the nineteen seventies has persisted at unacceptable rates (See Figure 1.). It is increasingly recognized as a stubborn problem that is not solvable by fine tuning of national fiscal and monetary policies. Nor is the creation of temporary and dead-end jobs in the public sector more than a palliative. Training programs go nowhere without viable jobs for their graduates.

Holding a meaningful skilled job is also recognized as the means of admission to most of the benefits of a prosperous society and to full citizenship in economic, social, and political life for an individual and his family. Alternating periods of unemployment and dead-end jobs leave their scars on successive generations.

Finally, the concentration of unemployment and underemployment among particular groups and localities means explosive social problems. The consequences of unemployment spread through the neighborhood to encompass its small businesses, its public services, and its education system so as to poison the social atmosphere of sections of our country.



SOURCE: 1960–69, INTERNATIONAL ECONOMIC REPORT OF THE PRESIDENT, WASHINGTON, 1977, p. 146
1970–77, ECONOMIC REPORT OF THE PRESIDENT, WASHINGTON, 1978, p. 291

Figure 1. Unemployment in the United States, 1960-77, in Percent of All Workers

The solution must be found in job creation - - particularly skilled jobs - - in the private sector. Innovation plays a key role, for high employment has been associated with the development of new industries and products, founded on new technology; and small businesses have an impressive record of creating new jobs through new technology. A previous study for the Commerce Technical Advisory Board found that from 1969 to 1974 employment increased at an annual rate of only 0.6 percent in a sample of large mature companies, at a rate of 4.3 percent in established but innovative companies, and at a rate of 40.7 percent in young high technology companies.[2] (See Figure 2.) Of course, the success of new products may result in the displacement of old products. Still the process of innovation - - the adding of new products to the economy - - stimulates demand and investment. It permits noninflationary growth in overall demand and offers escape from the dilemmas of continuing stagflation.

B. Export Performance

The strength of the dollar rests ultimately on our success as a trading nation. The postwar pattern in U.S. trade is a relatively simple one. We have deficits - - more imports than exports - - in minerals, fuels, and other raw materials as well as in less technologically intensive manufactured products such as textiles and shoes. We cover these deficits by surpluses - - more exports than imports - - in such technologically intensive products as aircraft, chemicals, and electronics. Also contributing significantly to the surplus is trade in agricultural products. Much of our success in agriculture is based on the high level of innovativeness displayed by American farmers and their supplying industries, underscoring the importance of including small farms and small food processors within the concept of innovative small businesses.

While our trade in agricultural products continues to provide a significant surplus (See Figure 3.), the recent record of trade in manufactured products is depressing. As shown in Figure 4, the U.S. share of world exports of manufactured goods has dropped alarmingly over the past 20 years. Traditionally, we have been a net exporter of manufactured products, but our imports of such products by 1972 grew to exceed exports, creating one of the factors in the U.S. devaluation decision. With the price advantage

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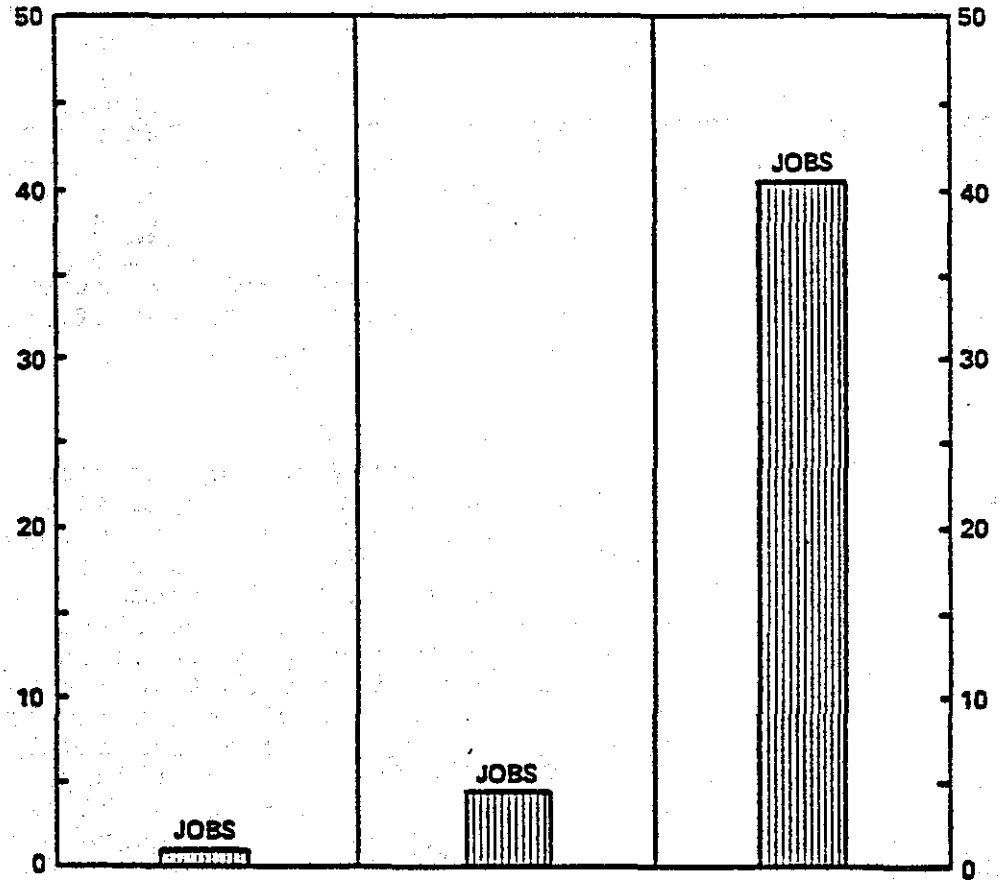
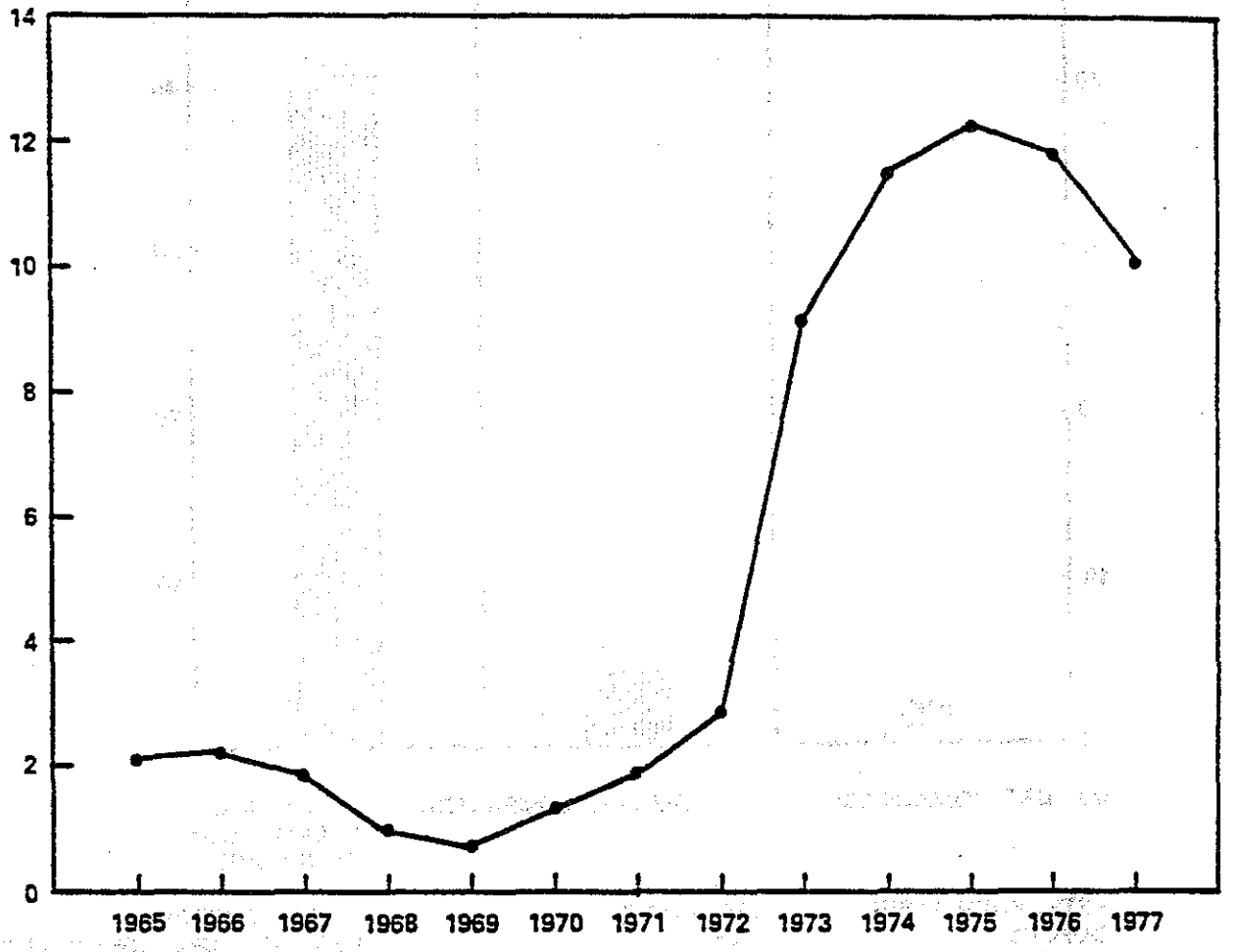
[2] The Role of New Technical Enterprises in the U.S. Economy (A Report of the Technical Advisory Board to the Secretary of Commerce, 1976) Appendix A. See also the statement of Dr. Edwin V.W. Zschau, Chairman, Capital Formation Task Force of the American Electronics Association, before the Senate Select Committee on Small Business, February 8, 1978.



MATURE COMPANIES:	INNOVATIVE COMPANIES:	YOUNG HIGH TECHNOLOGY COMPANIES:
BETHLEHEM STEEL	POLAROID	DATA GENERAL
DUPONT	3M	NATIONAL SEMICONDUCTOR
GENERAL ELECTRIC	IBM	COMPUGRAPHIC
GENERAL FOODS	XEROX	DIGITAL EQUIPMENT
INTERNATIONAL PAPER	TEXAS INSTRUMENTS (1953–74)	MARION LABS
PROCTOR & GAMBLE		

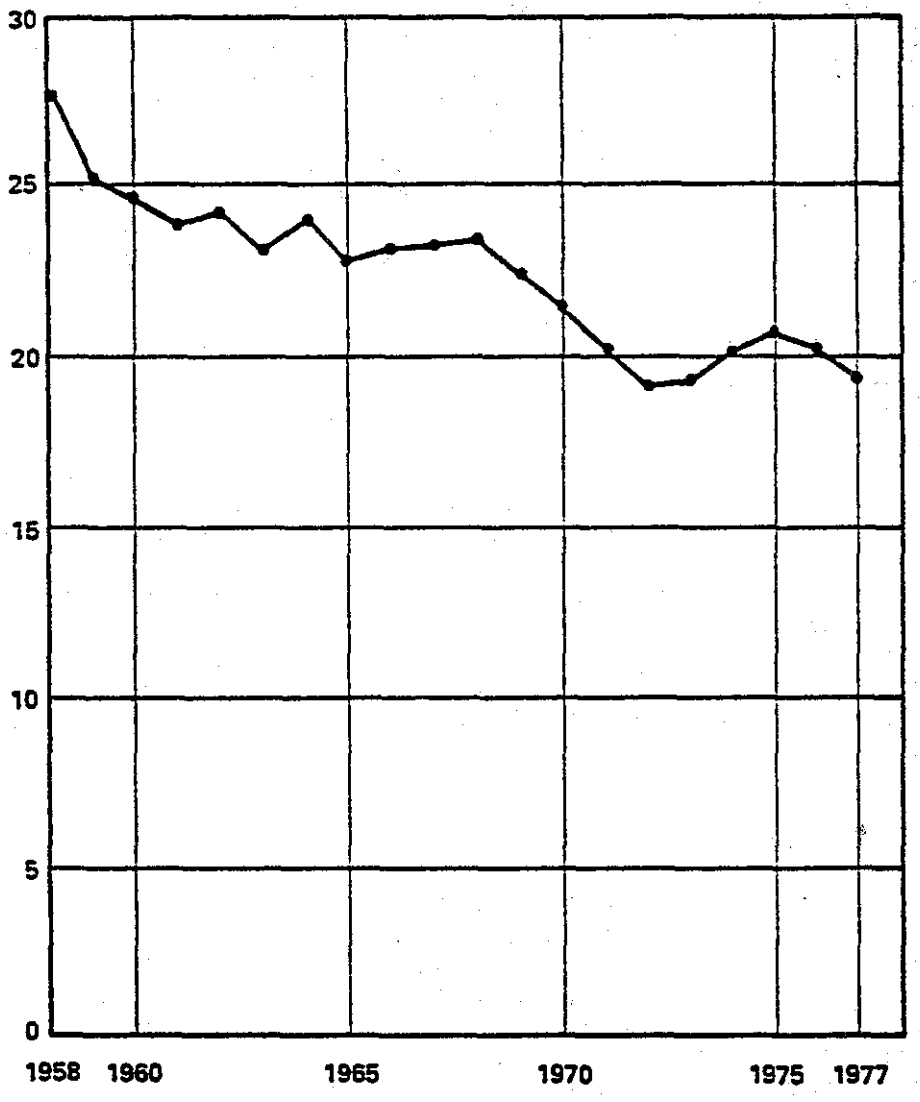
SOURCE: THE ROLE OF NEW TECHNICAL ENTERPRISES IN THE U.S. ECONOMY. A REPORT OF THE COMMERCE TECHNICAL ADVISORY BOARD TO THE SECRETARY OF COMMERCE, JANUARY 1976, p. 2.

Figure 2. Average Annual Growth of Jobs in Innovative Companies, Mature Companies, and Young High Technology Companies, 1969-74, in Percent (Compounded)



SOURCE: 1965–76: INTERNATIONAL ECONOMIC REPORT OF THE PRESIDENT, JANUARY 1977, p. 151. 1977: U.S. DEPARTMENT OF COMMERCE, OFFICE OF INTERNATIONAL ECONOMIC RESEARCH.

Figure 3. U.S. Foreign Trade in Agricultural Products, 1965-77 (Balance in Billions of Dollars)



SOURCE: COMMERCE AMERICA, JUNE 19, 1978, p. 9.

Figure 4. U.S. Share of World Exports of Manufactured Goods, 1958-77, in Percent

from the 1973 devaluation, trade in manufactured products by 1975 generated a 22 billion dollar surplus. By mid-1978, however, our trade surplus in manufactured goods disappeared, which also demonstrates the decline in the U.S. competitive position in manufactured products. (See Figure 5.)

The decline in the balance of trade with respect to manufactured products underlines the importance of continued innovation. Economists have shown the existence of a product cycle in which new products tend to be developed and introduced in industrialized countries and particularly in the United States. Such products are exported to the rest of the world in their early years. But as products become standardized, their technology well known, and their market acceptance widespread, other countries, especially those with lower wage rates, begin their manufacture, first for their home market, and then for export, and at times even to the innovating country.[3]

In this product cycle our advantage has traditionally been in innovation and, as products mature, we must innovate new or improved products and create new processes. In this way we can remain both a successful trading nation and a high-wage country. The American trade problem originates, in part, with the declining innovativeness of our economy relative to those of other countries.

Another of our advantages has been the high productivity of our agriculture. The small family farm, however, is not realizing its potential in contributing to both agriculture exports and domestic consumption because not enough agricultural research has been directed to technological innovations that are responsive to its needs.

C. Productivity

One way the U.S. can offset the effects of its high wages in international competition is by increasing productivity -- more output per worker. Greater productivity is also significant domestically for it permits combining rising wages with stable prices. And in the long run, more output per worker creates the economic growth that has allowed each generation to live better than its parents.

While output per man-hour in manufacturing doubled in the United States from 1950 to 1976, it increased nine times in Japan, more than four times in West Germany, and nearly four

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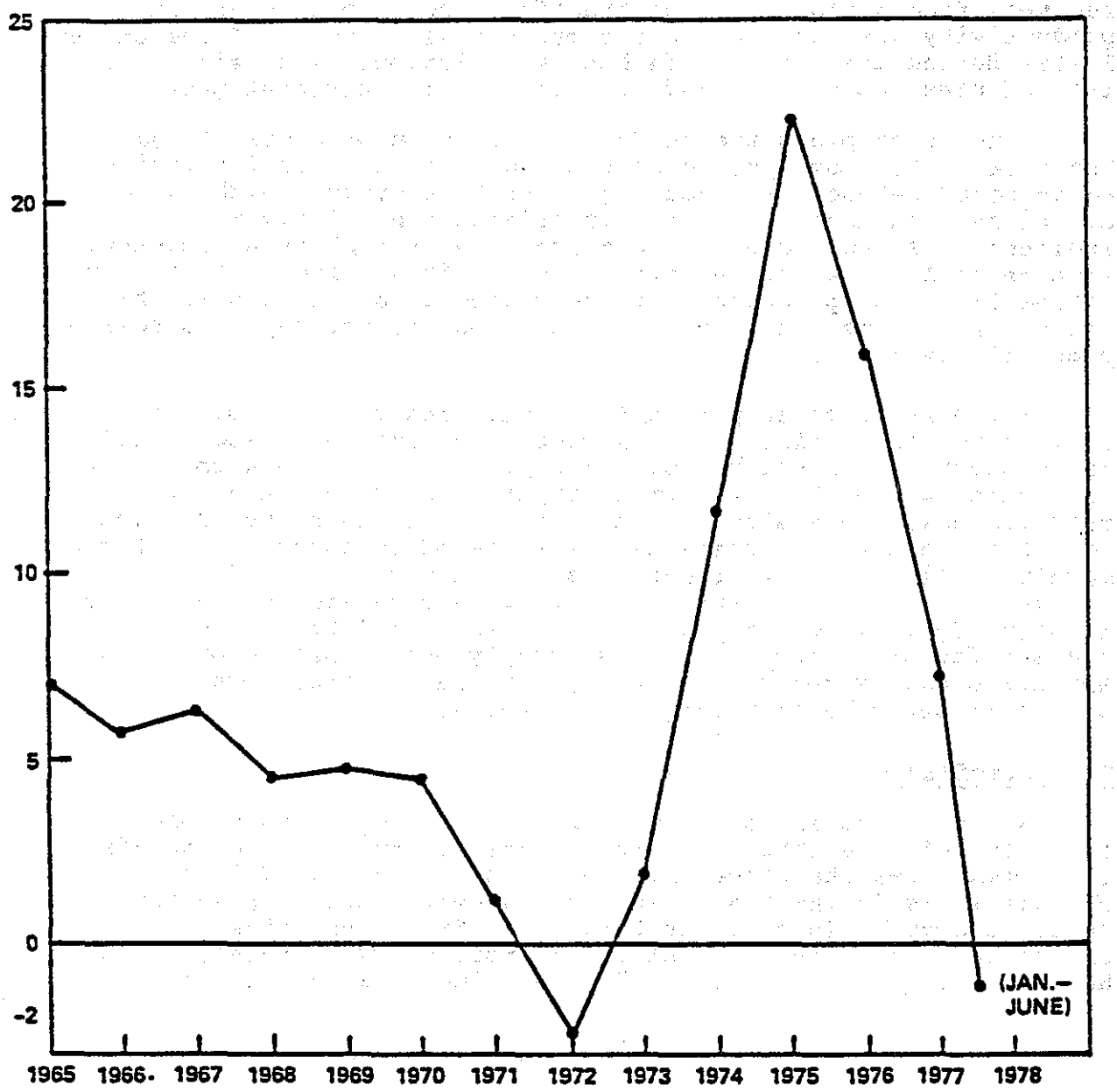
[3]Raymond Vernon, "International Investment and International Trade in the Product Cycle, "Quarterly Journal of Economics, Vol. LXXX (May, 1966).



SOURCE: 1965–76: INTERNATIONAL ECONOMIC REPORT OF THE PRESIDENT, JANUARY, 1977, p. 152. 1977–78: U.S. DEPARTMENT OF COMMERCE, OFFICE OF INTERNATIONAL ECONOMIC RESEARCH.

Figure 5. U.S. Foreign Trade in Manufactured Goods, 1965-78 (Balance in Billions of Dollars)

times in France. Among the industrialized countries, only the United Kingdom had an increase comparable to that in the United States. (See Figure 6.) While the record of other countries reflects a recovery from World War II destruction, and some catch-up in productivity was inevitable, the productivity record of the United States during the last decade has been disappointing relative to that of other countries, and to that of our own recent past.

Innovation plays the fundamental role in productivity gains. The effect of innovation is most direct with process innovations -- improved methods of producing existing products which raise output per man-hour. New products affect productivity more indirectly. A new product of one industry -- such as a computer, a machine tool, or a new material -- will often raise productivity in the firm that purchases the new product. Various studies have shown that innovations in these two forms are the major sources of productivity growth.[4]

Another factor in productivity has been the rise of the service sector. While services broadly defined were about half the economy at the end of World War II, services now account for two-thirds of the U.S. economic output.[5] Services have traditionally had a slow rate of productivity increase, but the reduction in clerical costs with the use of computers and office machines illustrates what can be achieved with new products and new methods. With a large and growing service sector, innovation is of critical importance both in the service sector itself and in the manufacturing industries that supply both improved products and new ones. Moreover, in the service sector small businesses play a larger role than they do in manufacturing.

D. Stagflation

While the causes of stagflation are not well understood, there is evidence that a declining rate of innovation compounds and intensifies the forces leading to stagflation. This is because it is in the highly innovative sector that marked price declines occur. To take three examples from innovative industries: (1) the price of the transistor by 1965 fell to one hundredth of its 1951 value, (2) the price of a long distance

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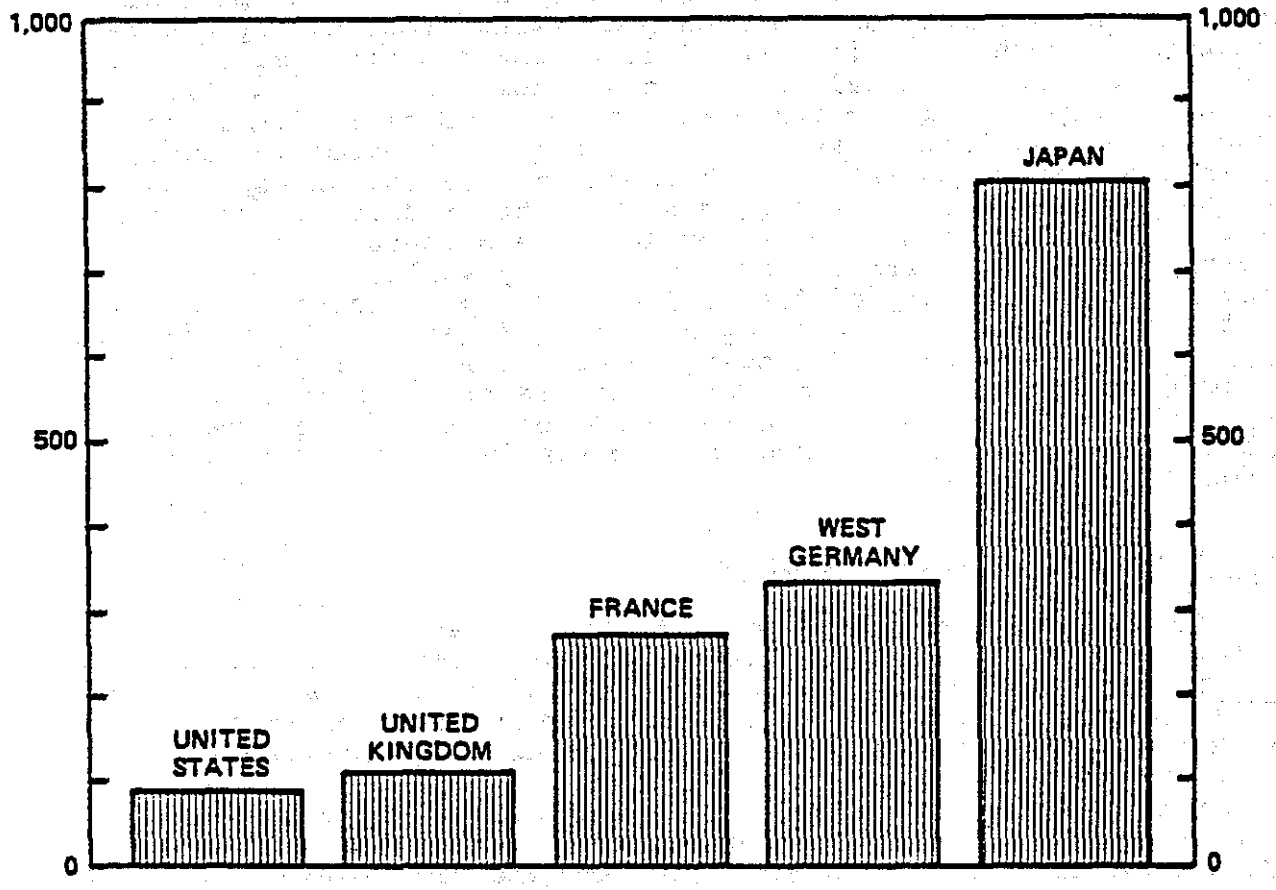
[4]While productivity is often measured as output per worker, total factor productivity is a more comprehensive measure because it reflects the role of increased capital per worker. Again, however, innovation plays the key role in raising total factor productivity. See, for example, Edward S. Denison, Why Growth Rates Differ (The Brookings Institution, 1967), pp. 7-9.

[5]U.S. Department of Commerce, U.S. Service Industries in World Markets (1976), p. 7.



SOURCE: "OUTPUT PER HOUR, HOURLY COMPENSATION, AND UNIT LABOR COSTS IN MANUFACTURING, ELEVEN COUNTRIES, 1950–77," BUREAU OF LABOR STATISTICS, U.S. DEPARTMENT OF LABOR, MAY 4, 1978.

Figure 6. Output Per Hour in Manufacturing (Increase in Percent, 1950-76)

telephone call by 1970 was half its 1950 price, and (3) the price of a standardized calculation on a current model computer in 1977 was one percent of what it was in 1957.[6] Such sharp price reductions contribute to price stability by offsetting price rises elsewhere in the economy.

Innovation has also made American agriculture the most productive in the world. The American farmer now feeds 55 of his fellow countrymen compared to 7 in 1900. A substantial part of the gain in agricultural and food processing productivity has been achieved through intensive use of large-scale capital equipment, fossil fuel, and chemical based innovations. These innovations are mostly applicable to the larger farms, and small farms and food processing units have not received the attention warranted by their economic potential. Furthermore, the recent slowdown in agricultural productivity suggests that the traditional approaches have diminishing returns even for large farm operations. The inexorably rising costs of food in a hungry world, rising cost and uncertain availability of fossil fuels, the plateauing of major food crop productivity, growing scarcity of water, continuing high rate of soil erosion, and growing concern over quality of life indicate that innovation in agriculture is still urgently needed but with a redirection toward technologies that are less capital and fossil-fuel intensive and more conserving of other natural resources.

E. Innovation and New Problems

Today the economy is faced with challenges of achieving a better environment, renewing blighted inner cities, developing alternative sources of energy, and conserving energy and resources. Small innovative enterprises can play important roles in all of these areas, especially in rebuilding inner city communities.

With innovation, new opportunities and options become available for new, technically oriented, small businesses in revitalizing inner city communities. These include new types of building design, construction, and renovation; installation and maintenance of solar energy devices; urban farming and small-scale food processing; specialized computer-based education training centers; technology application centers; health care centers; and private delivery of welfare services. Widespread participation in small enterprises gives control to residents of the inner city and provides them the long-absent economic opportunity and incentives for success. Most importantly, urban revitalization that is based on diverse profitable enterprise rather than a host of public programs will provide a community the means of being self-sufficient and responsive to changing needs from within.

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[6]Data for 1 and 2 from Burton Klein, Dynamic Economics (Harvard University Press, 1977) pp. 130 and 138; for 3, Control Data price/performance records on central processing units.

F. The Unnoticed Crisis

By its nature a decline in innovativeness is not readily perceived. We do not see this crisis the way we see the urban decay or the lines at the employment office. But we think this unnoticed crisis underlies in large part our visible crises.

The Work Group believes that innovativeness in U.S. industry has declined substantially over the past decade. We also believe that an important factor in the decline is a series of difficulties besetting small, technically oriented firms. Because small firms have been found to have a much greater efficiency in innovation, a general decline in U.S. innovation could be expected if our small, technologically innovative businesses were to fall upon hard times.

Quantitative evidence corroborating this hypothesis is scarce, but support is contained in a study commissioned by the National Science Foundation and completed in 1975.[7] The study reported that in the 1953-73 period, about half of the major innovations produced in U.S. industry were made by firms with less than 1,000 employees and about one-quarter by firms with less than 100. Also reported in the study was a significantly sharper decline in the number of major innovations per sales dollar attributable to smaller firms (less than 100 employees) since 1967 than in larger ones (more than 1,000 employees): 33 1/3 percent compared to 21.1 percent. The decline in innovation has been accompanied by the virtual disappearance of seed venture capital to support the establishment and growth of small, technically oriented firms. (See Figure 7.)

This less visible crisis may contribute to some of the more visible problems - - the deficit in the balance of payments and weakening of the dollar, the productivity slowdown, and the devastating effects of stagflation on jobs, urban blight, and our standard of living - -all of which gives an urgency to the consideration of measures to reverse this decline, and to permit small, technically oriented firms to make again the contributions to the economy they achieved in the fifties and sixties. It is to these recommendations that we now turn.

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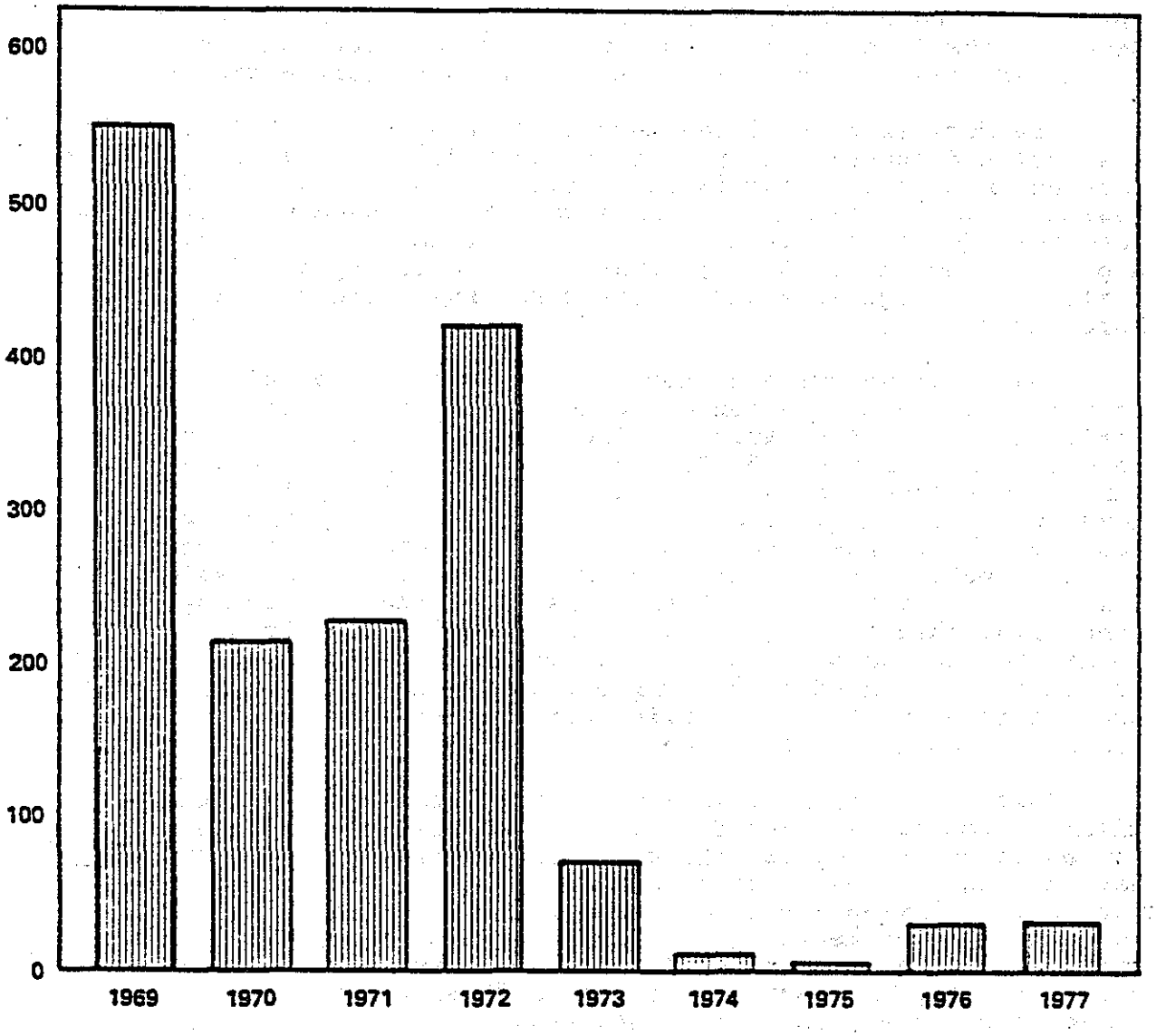
[7] William K. Scheirer, Small Firms and Federal R&D (Washington) p.9. See also Richard O. Zerbe, Jr., "Research and Development By Smaller Firms", Journal of Contemporary Business, Spring 1976.



SOURCE: REPORT OF THE SBA TASK FORCE ON VENTURE AND EQUITY CAPITAL FOR SMALL BUSINESSES, U.S. SMALL BUSINESS ADMINISTRATION, JANUARY 1977, p. 13 (1969–75); GREYLOCK MANAGEMENT CORP. (1976–77).

Figure 7. Number of Small Company Public Issues, by Years

III. RECOMMENDATIONS FOR RESTORING AND ENHANCING THE VITALITY OF SMALL TECHNICALLY ORIENTED BUSINESSES

A. Increasing the Availability of Capital

Access to the public securities market for all business firms is controlled by regulations of the Securities and Exchange Commission. Full compliance with these regulations, which is necessary to protect the interests of investors, can be excessively burdensome to business firms, and especially so to small business firms. In recognition of this principle, the SEC created Regulation A, which facilitates small securities offerings by exempting them from the costly and time consuming requirements of full registration. Over time, the value of the exemption was reduced markedly because of inflation. The SEC has, however, recently raised its ceiling and also modified Regulations 144 and 146 so as to facilitate the sale of equities in small businesses by major stockholders. With these changes in securities regulation, the major barrier hindering access to the securities market by small businesses lies in the tax laws. It is to be hoped that the SEC will review its regulations on a regular basis and revise them periodically so as to minimize their adverse impact upon small businesses.

SEC regulations are one illustration of the way government policies shape the structure of capital markets. Actions of other government agencies also have an impact. We believe that the combined effect of policy changes over the past decade has served to place small companies at a disadvantage with respect to access to capital markets.

Policy changes have also made the climate for investment in small businesses more unpredictable. Small operations are inherently fraught with uncertainty, and abrupt changes in government policy compound these uncertainties, making investment in small businesses excessively risky.

We believe government policy must create a more favorable and predictable climate for small business investment. Towards this goal, we recommend five specific actions that reverse the trend of placing small businesses at a disadvantage in obtaining capital and key personnel.

1. Taxation of Capital Gains

Changes in capital gains taxation are probably more responsible than any other factor for the deterioration in technological entrepreneurship that has occurred in the United States during the last decade. Such changes successively have lowered after-tax returns for successful innovation to a level where now, technologically innovative firms no longer are able to attract adequate investment. The present level of capital gains taxation has become a critical constraint on the founding and expansion of small, technically oriented firms.

Engaging in industrial innovation is inherently risky because uncertainties of development of new technology are compounded by uncertainties of market acceptance of new products, processes, and services. At the same time innovation is a capital intensive activity, not because it requires such massive investment as steel and chemicals, but because of the time lag between launching a development and its large-scale market acceptance. Capital is required to cover the expenditures for start-up costs before revenue begins to be realized. Such capital is forthcoming only when potential investors believe that the after-tax returns will be adequate to cover the risks. The problem of adequate rewards, however, is not just one for capital; key management and technical personnel traditionally have been compensated for the personal risks in joining uncertain ventures by sharing in the fortunes of the firm rather than by salary payments. In our free enterprise system successful technical entrepreneurship creates the economic values. These, in turn, are reflected in the rise in stock prices of the enterprise and realized by investors and key individuals by the sale of their stock in such enterprises. Thus the after-tax capital gain is the critical incentive for technical innovation by small firms.

Since 1970, the tax on capital gains has increased dramatically. Prior to 1969, the maximum capital gains tax rate paid by individuals was 25 percent. The Tax Reform Act of 1969 increased that rate to a maximum of 40 percent -- a 35 percent rate on the capital gains themselves and an additional 5 percent possible from the operation of the minimum tax. Legislation also reduced the tax on earned income from a maximum rate of 70 percent to 50 percent.

Thus the differential between the taxation of salaries and capital gains narrowed from 70 percent on salaries and 25 percent on capital gains to 50 percent and 40 percent respectively.[8]

The Tax Reform Act of 1976 provided for further increases in the minimum tax and also raised the maximum rate on capital gains to 49.5 percent. These changes virtually eliminated the differential between the rates on earned income and capital gains. The effect of these changes was further compounded by a high rate of inflation which produced significant capital gains in current dollars, and hence capital gains taxes, for assets whose value after adjustment for inflation had actually declined. The impact of such changes in taxation has been dramatic for the small, technically oriented firms in which the prospect of capital gains has been the major incentive for investors. Therefore, we place the highest priority on a capital gains tax reduction targeted on small, technically oriented firms.

We consider such tax reduction a preferred method of improving the availability of capital to small, technically oriented firms. By increasing the rewards for successful ventures, an incentive is provided to manage such enterprises in an efficient way, leaving to the marketplace the distribution of the incentives among firms. Thus such an approach is preferable to the provision of loans or other federal financing to small firms, an approach that would thrust upon the federal government the difficult task of deciding among promising loan applicants. We recognize that our proposal might result in an initial revenue loss to the federal government, but given the narrowly limited target of the proposed tax reduction, it would be a minimal one, and losses would be offset by the gains in employment and output from these successful firms.[9]

The 95th Congress recognized the negative consequences of the present high rate of capital gains tax by passing significant rate reductions. The legislation, however, does not restore the 1969 rates. Given the risks of small, technically oriented businesses we consider such a rollback essential for these firms to realize their potential in such vital areas as job creation. We also consider essential an even lower rate of 10 percent to attract investment in the smallest of businesses -- for example, those with less than 100 employees. Application of the lower rate would be determined by the size of the businesses at the time the investment was made and thus serve to attract capital to

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[8] Tax Policy, Investment and Economic Growth (A Report by Securities Industry Association, 1978) p. 63.

[9] Michael K. Evans. The Economic Effects of Reducing Capital Gains Taxes. Chase Econometrics Associates, Inc., April 1978. See also Tax Policy, Investment and Economic Growth, pp. 34-7.

new firms and to recognize the higher risk of investment in the smallest firms. We would exclude from the rollback all real estate activity, because such transactions do not have as high a potential for job creation as investment in other small businesses.

Recommendation 1.

We recommend that the capital gains tax rate be reduced to 25 percent (the pre-1969 rate) on the capital gains realized from the sales of stocks of small businesses (less than 500 employees at date of purchase) whenever such stocks have been held for more than three years, with a rate of 10 percent for the capital gains of investors in the smallest businesses (less than 100 employees at date of purchase). These reduced rates would not apply to capital gains realized from the sale of real estate.

2. Tax-free Exchange of Stock

Continued investment even in successful, technically oriented, small firms whose stock has risen in value usually remains risky. Stockholders have a propensity to diversify their investment. Under present tax laws often the most profitable way to diversify is through merger with a large firm, carried out by a tax-free exchange of stock. Investors find that equity shares of large firms are likely to be more liquid and represent a diversified set of economic activities. Yet this method of diversification tends to concentrate capital in larger firms.

We consider it important instead to have tax policies that encourage the use of capital in the start-up of new firms. At the same time we recognize that that investor's desire for diversification of his risk is a legitimate one. Therefore we would like to establish an alternate route for tax-free diversification of risk that would encourage the formation and growth of small firms by allowing the tax-free rollover of investment in one small firm to another such firm.

We think such a provision -- similar to the rollover provision on sale of homes -- would make funds available to new, small, technically oriented firms, precisely from the most knowledgeable and receptive investors -- those that have already participated in such ventures. It would remove the tax incentive for the premature sale of successful firms to large firms and thus serve to retain at least some of them as independent business entities during their dynamic early stages of growth. Further, it would allow the investor to diversify by holding stock in several small, technically oriented firms.

Essentially the same proposal was made in 1976 by the Tax Policy Task Force of the Small Business Advisory Committee on Economic Policy.

Recommendation 2.

We recommend deferral of capital gains taxes on the sales of stock if the proceeds are reinvested within one year in small businesses, except those whose principal activities are real estate transactions.

3. Taxation of Corporate Income and Tax Treatment of Start-up Losses

Taxation of Corporate Income. Not only have small businesses experienced great difficulty in obtaining capital in their start-up period, but they continue to have trouble finding capital for financing expansion during their early years of existence. Although quantitative data are not readily available, capital shortage is believed to contribute significantly to the high failure rate of small businesses.

Causes of capital shortages in business firms range over a broad spectrum, but in the case of small young companies that are bringing new products or services to market, current tax rates on net earnings are so high as to preclude establishing a solid financial base that is attractive to investors. The best and easiest way for small firms to achieve a sound financial base and adequate funds to support expansion is, of course, through retained earnings. Current tax rates on corporate earnings are not, however, sufficiently differentiated between small firms and large established corporations, although the reductions made by the 95th Congress in the corporate tax structure were a step in the right direction. Before the 1978 reductions, net earnings by all companies, regardless of size and age, were subject to a tax of 20% on the first $25,000 of net income, 22% on the next $25,000, and 48% on income over that amount. In 1978, Congress lowered these rates to 17% on the first $25,000 of net income, 20% on the next $25,000, 30% on income between $50,000 and $75,000, 40% on income between $75,000 and $100,000, and 46% on income over $100,000. Most states also collect income tax on small businesses, and many in addition impose taxes on dividends to stockholders.[10] We believe small businesses would have better chances for survival and growth if the tax rates on net earnings were reduced further.

[10] Tax Review, Vol. XXXVIII, No. 12, December 1977, p. 47.

Tax Treatment of Start-up Losses. The established corporation is provided a tax incentive for innovation in that its expenses for the early phases of innovation are a deduction from its corporate income tax. The new firm cannot obtain the same tax benefit since it lacks profits from which losses can be deducted. Such losses can, however, be carried forward and charged against income in subsequent years, but only within a five-year period. Some of the most advanced and promising technology has a longer gestation period and so does not yield profits within this five-year span to which earlier losses can be offset. In such cases there is a tax bias against the smaller firm as compared to the large firm. We believe this tax bias should be eliminated.

Recommendation 3.

We recommend that the threshold for application of the full corporate tax rate of 46% be raised for small businesses from $100,000 to $200,000 of annual net income; and for annual net income below $200,000 a progressive rate schedule beginning at 10% on the first $50,000, and increasing in 10% increments to $200,000 on each additional $50,000. In addition we recommend that the carry-forward provisions for start-up losses of small businesses be extended from five to ten years.

4. Qualified Stock Option Plan for Key Employees

Small, innovative companies depend upon stock incentives to attract and retain key employees because they cannot afford the high salaries paid by larger companies. Small companies tend to go through a growth cycle where, in the early stages, technical knowhow is the dominant skill required. In due course, commercial products or services are produced from this knowhow, but the number of customers is small. Later, as market opportunities expand and production grows, new requirements develop: how to manufacture and market products on a larger scale and how to organize and operate efficiently more complex activities. This stage requires managerial talents that are more likely to be found in larger firms than in smaller ones.

The problem, then, is how to attract experienced managers from larger companies. Prior to 1976 a widely used and successful incentive was an Incentive Stock Option, which allowed a key employee the following choice: If he chose not to be taxed in the year of grant on the then value of the stock, he could defer payment of tax from the exercise date of the option to the earlier of (1) the year of sale of the underlying stock or (2) ten years after the grant of the option. The Tax Reform Act of 1976

eliminated this option. Consequently, the current law unduly penalizes key employees of smaller companies who must sell optioned stock at the time of option exercise in order to pay the required tax, yet are unable to sell the stock obtained from exercising the option because of the limited or illiquid market for the stock.[11]

Recommendation 4.

We recommend restoration of the Qualified Stock Option Plan for Key Employees of small businesses.

5. Pension Fund Investment

Funds available for investment are increasingly under the control of institutional investors.. Pension funds are a leading example, and their assets are now about $200 billion. The managers of such funds are subject to ERISA regulations, and a conservative interpretation of these regulations requires the fund managers to limit their equity investment to stocks of blue chip firms traded in large volumes on public exchanges. Amending ERISA regulations could open up a new source of funds for small, technically oriented firms. We find much merit in the recommendation of a 1976-77 Small Business Administration Task Force on Equity Finance that ERISA be amended in such a way as to increase the availability of capital to new, small, innovative firms without jeopardizing the safety of pension plan investments.[12]

Recommendation 5.

We recommend (1) that ERISA's prudent man standard be restated so that it is clearly applicable to the total portfolio of pension fund investments rather than individual investments, and (2) that pension fund managers explicitly be permitted to invest up to five percent of pension fund assets in small firms.

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[11]"A Program of Tax Revision Proposals to Enhance Capital Formation for Growth Businesses", National Venture Capital Association (NVCA), Washington, D.C. May 1, 1977, pp. 9-11. Also see pp. 34-36 of Technological Innovation: Its Environment and Management, U.S. Department of Commerce, Washington, D.C., 1967, sometimes referred to as the Charpie Report, for a discussion of the merits of liberalized stock options for small firms.

[12]Pages 14 and 15 of the cited report.

B. Reducing the Burden of Regulation

Small businesses, along with large businesses and non-profit institutions, have been burdened by the recent expansion of both federal and state regulations. Some of the recent regulations -- those for occupational safety and health and for environmental protection -- have impacted most businesses. Others -- those for food and drugs and auto safety -- have applied to specific industries. We understand the social concerns that led to such regulations, and we are aware that both federal and state governments are reviewing whether current regulations are the most cost-effective way of dealing with these societal problems. For example, the Interstate Commerce Commission is relaxing its rules against shippers with their own trucking operations to seek for-hire traffic to eliminate otherwise empty back-hauls. We also recognize that the balancing of social gains and economic losses in assessing regulation is a complex task, ill-suited to a work group focussing primarily on the job-creating potentials of innovations by small, technically oriented businesses.

We note, however, that innovations -- because they involve new products, services, and processes -- are likely to encounter considerable regulatory uncertainty.[13] Such uncertainty is particularly burdensome to small businesses because they lack the specialized staff of large businesses to cope with the regulatory maze. As a result the task of regulatory compliance is likely to fall upon the already over-committed line management of small businesses. Ultimately it reduces their competitiveness both in domestic and foreign markets. A partial solution lies in the creation of regulatory advisory services, themselves largely small profit-making businesses, which can develop computer data bases and an expertise for coping more effectively and efficiently with the complexity of government regulations than individual small businesses. Such a service can save the time of small business management and reduce the cost of compliance.

To encourage the formation of such firms as well as to recognize that even the services of advisory firms will only reduce, but not eliminate, the burden of regulatory compliance on small businesses, we consider it desirable that more than the deduction of the actual business expense be permitted for payment to regulatory advisory firms. Furthermore, as a matter of good government, we think the cost of regulatory compliance for small businesses should be highlighted in government decision making by a tax deduction that exceeds the actual expense.

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[13]George S. Lockwood, Founder and General Partner, Monterey Abalone Farms, "An Address to the Third Annual Colloquium or Research and Development Policy," American Association for the Advancement of Science, Washington, D.C., June 21, 1978.

Recommendation 6.

We recommend that small businesses be allowed to deduct twice their payments for regulatory advisory services related to compliance with federal, state, and local regulation.

C. Improving the Diffusion and Application of Technology

There exists in the United States an enormous volume of information and technology in the laboratories of universities, government, and business. Much of it lies dormant: little is transferred from one of these huge knowledge reservoirs to another, and even less from the reservoirs for transformation into new products and services that serve societal needs.[14] This is social waste: knowledge is one resource whose use by one individual does not preclude its use by another. And for individuals to rediscover what is already known is costly to both the individual and society. We lack well-defined programs to encourage the widespread use of existing technology. We propose such a program that focuses on both the public and private sectors and, as will be emphasized repeatedly, is vital to small business.

Diffusion of technology is particularly important because our nation's R&D efforts are so concentrated as to limit their application to only a few sectors of the economy. Besides important concentrations in federal laboratories and universities, the largest firms in our economy account for much of the organized industrial R&D, especially in the chemical, electronic, aeronautical, and pharmaceutical industries. Small business cannot afford self-sufficiency in technology, and our society can ill afford to let technology lie idle.

1. Technology Transfers from Federally-Sponsored R&D

Universities. The present level of research effort is approximately $5 billion -- nearly 70 percent of which is financed by the federal government.[15]

The main reasons for the small amount of technology flowing into industry include lack of:

1. Well-defined programs and funds to implement technology transfer.

2. Incentives for faculty researchers to seek beneficial commercial applications for research results and to participate in technology transfer programs through personal linkages with users in industry.

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[14]Russel L. Ackoff and others, Designing a National Scientific and Technological Communication System, University of Pennsylvania Press, 1976, pp. 109-153.

[15]National Science Foundation, National Patterns of R&D Resources, National Science Foundation 77-310, pp. 10 and 2[illegible].

3. Attention to needs of industry.

4. A positive government patent policy that stimulates private industry to commercialize inventions by transferring rights instead of retaining patent rights in most cases.[16]

Through the establishment of a well-defined technology transfer program, technology flow into small business can be substantially increased. One important element is commercially available, computer-based information storage and communication systems. Massive amounts of information can be stored in the computer memory and quickly recalled. By including two types of information in the data bases -- one consisting of descriptions of technologies in terms that show prospective buyers the kinds of problems the technologies will solve, and the other describing the problems that are to be solved -- interaction can be facilitated between providers and users of technology.

Specifically, when an idea for innovative technology occurs to a scientist during the course of a university research project, he lists it with a commercial, computer-based communications technology data base service. Conversely, those seeking innovations use the same service to obtain information about technologies that may satisfy their needs. This interaction not only greatly increases the chances that the idea will be used, but more importantly it makes innovation possible in response to a combination of market pull and technology push instead of just technology push. Experience teaches that the most successful and least costly innovations are those where there was early linkage between the idea and the needs of the marketplace, because the development could be properly guided through interaction between researchers and users.

Funding for technology transfer programs should be included as part of each government research project grant. The amount recommended is five percent of the total project funding, a small amount in relation to the expected benefit to society.

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[16]Remedies for this serious deficiency were not addressed by this Work Group because it is being addressed by the Committee on Intellectual Property and Information, which was established by the Federal Coordinating Council for Science, Engineering, and Technology. The Committee is in the midst of an effort to arrive at an agreed Carter Administration policy with respect to the allocation of rights in patentable inventions resulting from federally-supported work done by nongovernmental persons. The Committee is chaired by Dr. Jordan J. Baruch, the Assistant Secretary of Commerce for Science and Technology. Its efforts are separate from, but to be coordinated with, the Domestic Policy Review on Industrial Innovation.

Within the university there should be a small administrative organization to help market the ideas for innovative technology. Royalties paid by industry should be divided among the university (to help defray administrative costs), the scientists originating the ideas, and those who are key in helping to find industrial uses.

Another way to encourage closer relationships between small businesses and universities is through having small businesses sponsor the research at universities just as large firms do presently. Such sponsorship could be expanded by allowing small businesses a double deduction from its income taxes.

Government Laboratories. The situation in government laboratories is much like that in universities. A key statistic is that the federal government spends over $1 billion annually to disseminate results of federally-funded R&D.[17] Yet it is frequently impossible or extremely difficult for either government or industry to get these results. Reasons for this are essentially the same as those listed for universities.

The government agency with the largest R&D budget and least effectiveness in technology diffusion is the Department of Defense. The low level of success is due to almost total reliance on documents produced by research and development projects as the means of transfer. Other government agencies relying solely on documents have the same low level of results.

NASA, through its technology utilization program, has made a greater and more diverse effort since 1962 to transfer its research results into commercial use. In addition to the dissemination of publications, NASA has established industrial applications centers that assist industry in acquiring information on NASA technologies. While the NASA program falls far short of what might be achieved, more technology is moved into industry than would be the case without the program.

The largest and most successful federal effort to diffuse technology has been the Extension Service of the Department of Agriculture. USDA field agents working at the county level throughout the United States and drawing from the Department of Agriculture sponsored research results make direct contact with individual farmers.

A final observation to be made on government and university technology transfer activities is that in all cases the process begins after the research and development program has been completed. As noted earlier, however, the most successful industrial innovations are those where there was an early linkage between the idea and the marketplace, so that the development can be properly guided.

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[17] See "Federal Management of Scientific and Technical Information (STINFO)" prepared for the Special Subcommittee on the National Science Foundation of the Committee on Labor and Public Welfare, U.S. Senate, February 1976, pp. 9-10.

We believe that there must be a change from the traditional and ineffective practice by most agencies of merely disseminating information as a means of technology transfer to the more comprehensive approach that has been outlined. Funding for implementing the comprehensive approach for technology transfer should be included as part of every government project -- five percent of the total project funds -- the same as for university projects. For comparison purposes, it should be noted that the U.S. Department of Agriculture Extension Service budget of $270 million is about 50 percent as large as the department's R&D budget of $500 million, and the NASA technology utilization budget is $9 million, or about 0.3 percent of the NASA R&D budget.

Therefore, our proposals focus on facilitating the transfer of technology from the concentrations in government laboratories, universities, and industry to small businesses, where it can often be applied to realize a larger share of its economic potential.

Recommendation 7.

We recommend that each federal agency allocate five percent of its R&D funds for technology transfer. These funds should be used to establish well defined and organized programs of technology transfer in which there are incentives to individual researchers to contribute their time and skills to the identification of commercial applications. Such incentives should be related to the benefits realized from technology transfer.

2. Technology Transfers Within the Private Sector

Another large store of under-utilized technology exists in business firms. Most firms use only part of their stock of technology in their own commercial activities, but the remaining, unused technology may have commercial applications elsewhere in our economy. Even more importantly, firms utilize technology in one product that may have applications to other products. Interfirm transfer of technology is constrained, however, by concern for proprietary protection. Much of this concern is unwarranted because even in the few areas of significant technological breakthroughs in recent years, the new technology was diffused so rapidly that any initial business advantage was soon lost. Thus, in most industries, a number of companies are selling the same basic product, differentiation being achieved by design features to improve user application and appearance. Hence, much of the technology of one firm can be used by others with little competitive threat. Given the benefits to society from increased technology transfer and in recognition of the added costs of marketing technology, we recommend that both financial and social incentives be used to stimulate large companies to make their technology available to small companies.

Financial Incentives. The most frequent method of transfer is through a licensing arrangement. Another way in which technology transfer occurs is through the spin-off of small businesses by large firms. We believe that such spin-offs will be encouraged by the capital gains rollback for small business as set forth in our first recommendation.

A large firm can use technology unrelated to its main activity as the basis for establishing a small business in which it takes a minority position. Its capital gains would be taxed at the lower small business rate just as for any other investor.

Both licensing and spin-offs need to be supplemented by greater incentives for business firms, large and small, to participate more actively in technology transfers, and these can be provided by changes in the tax code. It must be recognized that such transfers are costly, and both buyers and sellers must be able to perceive at least some chance that their costs for transferring their unused technology will be covered. Further, if they perceive the possibility of greater profit, their interest in transfer will be correspondingly greater.

Social Incentives: Social incentive would be provided by the community in the form of a consensus that large companies should make their technologies more available as part of their obligation to society. This is a reasonable gesture by any company, because all technology is in part a product of our educational system and diffusion of knowledge from the technical efforts of other organizations.

Recommendation 8.

We recommend that private sector individual or corporate owners of technology be rewarded, through appropriate changes in the tax code, for selling, leasing, or licensing their technology to small business firms in the United States. In addition, we recommend the establishment of a voluntary national policy to encourage companies to make their technologies available for noncompetitive uses by others.

D. Some Redirection of R&D Spending Towards Small Businesses and the Needs of Small Family Farms and Food Processors

While there has been widespread comment on the decline of U.S. R&D expenditures as a percent of our Gross National Product, this same trend has in recent years also occurred in such countries as France, the United Kingdom, and West Germany; the notable exception being Japan (See Table 1). The United States remains by far the largest money spender on R&D even if defense and space spending is excluded (See Table 2).

The Work Group does not contend that R&D spending in the U.S., in total or in the amount devoted to civilian needs, is either demonstrably deficient or excessive. We

do contend, however, that the amount spent by small firms is grossly inadequate. In 1975 only about three percent of our total national spending on R&D -- roughly $1 billion out of $35 billion -- was attributable to small firms. Funds from the federal government accounted for about two-thirds of this total -- the balance from small businesses themselves.[18] While this small proportion has prevailed for some time, we consider it disturbingly low in view of the impressive record of innovation by small businesses.

Table 1. Distribution of National R&D Expenditures in Selected Industrially Advanced Countries as a Percentage of GNP, 1961, 1967, 1972, and 1975.

	1961	1967	1972	1975
United States	2.74	2.91	2.43	2.32
Canada	1.01	1.33	1.17	1.20[E]
France	1.38	2.16	1.83	1.48
Japan	1.45[E]	1.55	1.89	2.00[E]
United Kingdom	2.69	2.69	2.39	2.25[E]
West Germany	1.20[E]	1.97	2.31	2.25

Source: National Science Foundation. Science Indicators 1976, p. 184, except estimates, as noted.

[18] Scheirer, op. cit., p. 10.

Table 2. Estimated R&D Expenditures for Civil Purposes, 1975

(In billions of dollars)

	Canada	France	Japan	U.K.	West Germany	U.S.
1. GNP ($)	152	338	493	229	425	1516
2. % R&D	1.2	1.48	2.0	2.25	2.25	2.32
3. R&D ($)	1.8	5.0	9.86	5.15	10.6	35.2
4. % R&D in Space and National Defense	5.3	26.2	1.7	24.5	8.1	34.4
5. % R&D in Civilian Programs	94.7	73.8	98.3	75.5	91.9	65.6
6. R&D in Civilian Programs ($)	1.7	3.7	9.7	3.9	9.7	23.1

Sources:
- Row 1. World Military and Social Expenditures 1978, pp. 21-2.
- Row 2. Table 2.
- Row 3. Product of Rows 1 and 2.
- Row 4. National Science Foundation. Science Indicators 1976, pp. 186-7.
- Row 5. 100% minus Row 4.
- Row 6. Product of Rows 3 and 5.

As seen by the Work Group, one of our principal problems is how to increase R&D in small business firms. Since there have been important innovations created by cooperative work between large and small businesses, we would include such cooperation in our concern to increase the share of federal R&D funds to small business firms.

The Work Group is aware of a recommendation made some years ago (1972) by a Commission on Government Procurement to the effect that awarding a fixed percentage of government procurement to small business firms is not in the national interest. While this may be a valid constraint insofar as all government procurement is concerned, we do not believe it should apply to federal R&D funds. The outstanding track record of small business in technological innovation is ample justification for assuring that R&D activity in small business firms be stimulated through increasing its share of federal spending on R&D. We recognize that in certain basic research programs, the commercial sector may be an inappropriate institution for R&D. We believe, however, that applied research projects jointly involving small businesses and universities can be highly effective, and we recommend that a substantial number of these be sponsored by the government.

The Work Group believes the National Science Foundation's program called "Small Business Innovation Applied to National Needs" has great potential for increasing technological innovation in the private sector and is worthy of emulation or even adoption by other federal agencies. By soliciting innovative proposals from small businesses, the program encourages the conversion of research on federal objectives to technological innovation in the private sector. This is done by requesting a contingent commitment for follow-on funding from a venture capital or large business source for continued development of the idea by the small firm if the research meets mutually agreed upon objectives.

Recommendation 9.

We recommend that each federal agency receiving R&D funds by appropriation from the Congress be required to allocate at least 10 percent of all such funds (excluding those for basic research) to small businesses and that this objective be achieved in annual 1% increments beginning in FY1980.

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Small business firms that invest substantial amounts of their own funds in R&D are subject to risks of temporary reversals that jeopardize the stability of R&D spending, which is often less critical in the short run than other uses of funds. Yet by reducing or eliminating R&D, the small firm may endanger its future and the continued development of new products and services necessary for its longer term growth and survival. Collectively the problem inhibits the growth of small innovative firms as a national resource.

Stability in R&D activity in small firms would be encouraged if such firms were allowed to establish and replenish a Reserve for Research and Development in better profit years to be used to stabilize R&D in lower profit or loss years. The reserve would allow the firm to retain more earnings, which is important to firms seeking credit and investment.

The reserve would not be available to firms that could not generate earnings, but rather would assist those firms that have proved their competence by profitable operations. These are the firms that need encouragement to grow faster and to invest in R&D and to stabilize R&D programs.

The reserve could be accumulated to a level of $100,000 or 10 percent of the most recent year's sales, whichever is higher, up to a $1 million ceiling. Contributions to the reserve could only be made to the extent that actual R&D costs are incurred in any year and limited to the higher of $50,000 or 5 percent of sales for any single year. Any use of the reserve for R&D would be taxable just as contributions to it are tax deductible. If the firm became a large business through growth, or merger or acquisition by another small firm, the reserve could be used but not replenished. Acquisition by a large firm would result in the reserve becoming taxable income.

Recommendation 10.

We recommend that small business firms be allowed to establish and maintain a reserve for R&D for use in times of financial stress.

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More must be done in addressing the steeply rising costs of food throughout our country. Obviously, many factors contribute to these increases, but one of the most important is the plateauing of productivity in major food crops. Per acre yields of wheat, sorghum, maize, soybeans, and potatoes have not increased since 1970. A significant part of the previous increases in productivity was accomplished with massive use of fossil fuels for cultivation, irrigation power, fertilizer, and pesticides. Costs of all of these are rising rapidly. Water shortages in a number of areas of the United States have occurred or are imminent. Productivity gains of the past have been associated with large-scale capital and fossil-fuel intensive agriculture. There is vast potential for improvement with innovations directed at developing less fossil-fuel and capital-intensive technologies, and technologies that make more efficient use of water and land. Research directed at creating these technologies would benefit both large and small farm operation

Small farms also are part of America's poverty problem. The conditions for many people, particularly blacks in rural areas in the South, are worse than in blighted urban areas.

The key element in improving the efficiency of small farms is technology. Capital, government policy, and other factors are important; but without technology appropriate to the task, capital and government policy cannot have the required effect.

Further substantiation of the potential of more emphasis on small-scale operations is provided by a brief review of some relevant current achievements, experiments, and emerging technologies.

- The Ball Company is marketing an energy-efficient canning operation that fits into 750 square feet of space.

- Solar technologies are emerging that make small-scale grain drying and storage more efficient than present methods, and provide a lower cost source of power for irrigation.

- The development of small-scale sprinkler irrigation systems is nearing completion. Indications are that these systems will provide a 15 percent savings in energy and as much as a 20 percent savings of water.

- New, stronger, weather-resistant plastics are becoming available, which makes possible low-cost, small-scale hydroponic food growing and the manufacturing of small-scale methane gas generators.

- Farm-size nitrogen fertilizer plants using air, water, and electricity from windmills are under development.

- Multi-purpose, small scale farm tilling and harvesting implements are becoming available.

- Farm management training for diversified small-scale operations are now readily available through computer-based education.

- One of the most significant experiments under way is the model farm at Tuskegee Institute, where an income of $20,000 net per year is to be generated by a farm of 25 acres, of diversified high-value crops and other intensive agricultural technologies.

These examples demonstrate that new technologies can be developed to enhance significantly the productivity of small family farms and food processors with reduced requirements for capital and fossil fuels. With additional R&D effort, the viability of small farms over a wide range of conditions could be established. Furthermore, many of these kinds of small farm technologies are needed by developing countries and represent an important source of exports in the years ahead.

Recommendation 11.

We recommend that there be some redirection of federally supported agricultural research to the development of technology for improving the efficiency of small family farms and food processors and for making food production, transportation, and preservation less capital and fossil-fuel intensive.

E. Improving Export Performance

Much has been written about the fact that among industrially advanced countries, the United States is the least export minded. This can be discerned from the fact that less than eight percent of U.S. manufacturers export (perhaps 20,000 out of some 250,000 manufacturing companies). Moreover, the U.S. export base is highly concentrated: a recent survey conducted by Business International Corporation discovered that 123 firms accounted for 41 percent of U.S. exports of manufactured goods in 1976.[16]

There are several explanations for the low rate of participation of small firms in exporting activity. First, they lack the knowhow to find and penetrate export markets. Such knowhow can, of course, be bought or acquired through experience, but it is expensive. Second, profit margins in international markets have not, until recently, been sufficiently high to attract a large number of small firms. The currency devaluations earlier in this decade have shifted the terms of trade to such an extent that exporting could well become a highly profitable activity for many small firms.

For this development to occur to any important extent, two kinds of measures are needed. One is institutional: a new private sector organization should be created to enable small firms to reach export markets on a shared-cost basis. The second is financial: special tax incentives are required to encourage small firms to overcome the initial costs of entering export markets. Once threshold barriers are overcome, the profitability of exporting can be expected to sustain the growth of exports from small, technologically based firms. Such exports would strengthen our balance of payments while simultaneously providing for the growth of small firms through opening new markets.

With respect to new organizations, we consider the most promising to be Small Business Export Trade Corporations (SBETC) -- private corporations to provide marketing services to a group of small firms. An SBETC must serve at least three clients who are small business firms, and its primary activity must be export promotion for small business. To encourage their formation, these organizations need special tax incentives.

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[16] "Effects of U.S. Corporate Foreign Investment, 1970-76," Business International Corporation, May 1978.

With respect to individual small businesses, we consider that significant tax incentives are needed to encourage the incurring of the initial special costs of entry into export markets. These include sales literature, sample advertising, trade fair participation, special engineering and tooling, new equipment, reserves for bad debts, and so forth. The special tax incentives as described are believed to be consonant with U.S. commitments to the General Agreement on Tariffs and Trade (GATT). If necessary, the proposed upper limits could be further constrained so as to prohibit a net rebate of income taxes to the participating firms.

Recommendation 12.

We recommend that the creation of Small Business Export Trade Corporations be encouraged by a double deduction for these corporations of up to $100,000 of annual expenses associated with the exporting activities of each client, with a loss carry-forward of ten years. In addition, we recommend that small businesses be allowed a double deduction of special expenses of serving export markets up to $100,000 annually.

IV. CONCLUSION

More new jobs, especially skilled jobs; better solutions to our national problems of urban decay, pollution, steeply rising costs of food and housing, and health care; and increased competitiveness in international markets, all depend upon our ability to stimulate the rate of technological innovation in the United States. Small businesses can play a significant role in achieving this goal.

The recommendations contained in this report are directed at restoring the vigor and vitality of our small businesses, which traditionally have generated the larger share of the truly innovative breakthroughs in science, technology, and engineering. Ways have been identified to increase the supply of venture capital, without which new businesses cannot get established, much less flourish. Some redirection of government R&D spending is recommended to channel more funds into R&D effort that is most likely to benefit small businesses and small family farms.

Recommendations are made for not only increasing the supply of new technology, but also for stimulating the transfer of technology from federally funded R&D projects to the private sector and from large business firms to small ones. Concrete proposals are offered for expanding exports and for reducing the heavy costs of compliance with government regulations.

Our recommendations do not call for federal aid to small businesses and small farms. On the contrary, implementation of all of the recommendations of this report, or of any one of them, does not require any increase in budgetary support from the federal government.

In addition to our 12 recommendations, we urge the Department of Commerce to encourage the creation of "Community Cooperation Offices", which foster the start-up and growth of small businesses. A Community Cooperation Office is a nonprofit corporation supported by private contributions. The major segments of society are participants, including state and local governments, large and small business, academia, religious organizations, labor unions, and farm organizations.

The Community Cooperation Office assists small businesses in getting started by providing seed capital and in profitable growth by furnishing assistance in locating needed technology and consulting help. Cooperation Offices should be informally linked with the Department of Commerce so that their experiences and concerns can be most effectively shared. The Minnesota Cooperation Office for Small Business represents a possible prototype for consideration by other states.

Finally, we urge the Department of Commerce to undertake the education of the American public as to the importance of technological innovation in creating solutions to our major social problems, and to the vital role of small business firms in the innovation process.

Biographic Summaries of Work Group Members

WILLIAM C. NORRIS, Chairman

B.S.E.E., University of Nebraska; Founder, Chairman of the Board, and Chief Executive Officer, Control Data Corporation; Founder, Engineering Research Associates; former Vice President, Sperry Univac.

SHERMAN R. ABRAHAMSON, Executive Secretary

Ph.D. (Geography), Clark University; Special Assistant to the Chief Executive Officer, Control Data Corporation; former Office Director, U.S. Department of Commerce; former Visiting Scholar and Special Auditor in Economics, Harvard University; former Professional Lecturer in Geography, Economics, and Business Administration, George Washington University.

JOHN H. CARTER

Ph.D. (Physical Chemistry), University of Oregon; Director, Semiconductor Materials Products, IBM; Member, Commerce Technical Advisory Board; Member, Board of Directors, Communications Village, Inc., Kingston, New York; Consultant, Harvard University Institute for Minority Business Enterprises, and Urban Business Education and Economic Development Association of Washington, D.C.

DONALD W. COLLIER

Ph.D. (Physical Chemistry), Princeton University; Senior Vice President, Borg-Warner Corporation; Member, National Research Council and Commerce Technical Advisory Board; Fellow, American Institute of Chemical Engineers; former President, Thomas A. Edison Research Laboratory; and former President, Industrial Research Institute, Inc.

WILLIS K. DRAKE

B.S.A.E., Purdue University; Founder and Chief Executive Officer, Data Card Corporation; Director, Riede Systems, Inc., Teleproducts Corporation, and APCO Capital Corporation; Chairman, Executive Committee, Industry Advisory Council, Institute of Technology, University of Minnesota; former Group Vice President, Data Products Corporation.

JOHN FREIVALDS

M.A. (Development Economics), George Washington University; Manager, Agricultural Projects, Experience, Inc.; former U.S. Peace Corps manager of farm cooperatives in Panama and Colombia; former Economist, Development and Resources Corporation, State of California; former Assistant to the President, I.S. Joseph Company, Minneapolis.

DANIEL S. GREGORY

M.B.A., Harvard University Business School; Chairman of the Board and Chief Executive Officer, Greylock Management Corporation; Director, Teradyne Corporation, National Venture Capital Association, and others; Trustee, Institute of Contemporary Art and the New England Medical Center.

VERNON H. HEATH

B.B.A., University of Minnesota; Co-founder and President, Rosemount, Inc.; Director, Tonka Corporation, First Trust Company of St. Paul, Abbott-Northwestern Hospital, and others; former Chairman, Board of Directors, American Rehabilitation Foundation (Sister Kenny Institute).

HERBERT C. JOHNSON

B.S.M.E., University of Colorado; Chief Executive Officer, Electro/General Corporation; Founder and former Chairman of the Board and Chief Executive Officer, MTS Systems Corporation; Director, Tonka Corporation; former Industry Advisory Council, Institute of Technology, University of Minnesota.

RICHARD S. MORSE

S.B. (Engineering), Massachusetts Institute of Technology; Industry Consultant and Director, Dresser Industries, Inc., Compugraphic Corporation, Scientific Energy Systems Corporation, and others; Founder and former President, National Research Corporation; former Assistant Secretary of the Army (R&D); former Senior Lecturer at the Sloan School of Management, M.I.T.

MARILYN NELSON

M.A. (Economics), Smith College; Chairman, Citizens State Bank of Waterville, Minnesota; Director, Northwestern Bell Telephone Company, Carlson Companies, Tyrone Guthrie Theater, Minnesota Orchestral Association, and others; Trustee, Macalester College and Member, Development Council, Smith College.

MERTON J. PECK

Ph.D. (Economics), Harvard University; Chairman, Department of Economics, Yale University; former Member, President's Council of Economic Advisers; former Director, Systems Analysis, U.S. Department of Defense.

NEIL SHERBURNE

Studied at Kansas State College and University of Minnesota; Member, U.S. Department of Labor Executive Reserve and Regional Manpower Advisory Board; Member and former Chairman, Board of Regents, University of Minnesota; former Secretary-Treasurer, Minnesota AFL-CIO.

ROBERT TAPP

Ph.D. (Religion), University of Southern California; Chairman, Humanities Program and Professor of Religious Studies, University of Minnesota; former Professor of Philosophy of Religion, Meadville/ Lombard Theological School; former Managing Editor, Zygon: Journal of Religion and Science.

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