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THE WHITE HOUSE  
WASHINGTON

November 5, 1976

ADMINISTRATIVELY CONFIDENTIAL

MEMORANDUM FOR:

GUY STEVER

FROM:

JIM CONNOR *JEC*

The attached article was returned in the President's outbox with the following notation:

"I would like Guy Stever's reaction when feasible."

Please follow-up with appropriate action.

cc: Dick Cheney

**Attachment:**

Article from THE WASHINGTON STAR - 11/4/76  
entitled: "U. S. Research Spending Hit by Proxmire"



THE WHITE HOUSE  
WASHINGTON

Dick Cheney

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I would like  
Amy Stewart's reaction  
when feasible.



# U.S. Research Spending Hit By Proxmire

By Cristine Russell

Washington Star Staff Writer

Although more than \$23 billion is allocated for federal research and development spending this year, "it is disconcerting that the scientific community has not yet come up with scientific tools for measuring the results of R&D," according to Sen. William Proxmire, D-Wis.

Proxmire, who has become a thorn in the scientific community's side with his "Golden Fleece" awards for research he considers a waste of taxpayers' money, today released a compendium of five studies which, he said, identify "serious and startling shortcomings in the way federal research and development funds are allocated and spent."

**THE PAPERS WERE** prepared at the request of the subcommittee on priorities and economy in government of the Joint Economic Committee, which he chairs, "in order to shed light on the federal R&D program which will spend an estimated \$23.5 billion in FY 1977. Of that sum, about \$14.9 billion or 63 percent will be spent for military and space activities."

Proxmire, in a statement issued today, said that there is a "strong consensus" among the authors — independent scientific and economic experts working in cooperation with the Library of Congress — that "techniques have not yet been developed to measure the results of federal R&D spending programs. One implication of this finding is that large amounts of public funds are being spent for R&D activities without a clear understanding of whether the potential or actual benefits are worth the costs."

Economist Lester Thurow of the Massachusetts Institute of Technology concluded that funds are often "misallocated because hard facts are overwhelmed by the success of the Manhattan Project and the space program."

**IN EACH CASE**, he said, "it seemed possible to achieve a specific objective — an atomic bomb or a man on the moon — if only we were willing to spend enough money and effort. This leads to the erroneous conclusion that all problems are potentially solvable in a short period of time."

But, he cautioned, "if the basic scientific facts necessary for a solution are not known, there is no guarantee that a major effort will speed up the solution and there may even be no sensible way of organizing a major effort."

Thurow feels that "to some extent, President Nixon's war on cancer falls into this domain. Quite sensibly, this war did not achieve the scale of either the space program or the Manhattan Project, but it probably has achieved a scale that is inefficiently large."

One problem, suggested Thurow, is that "while no one quarrels with the need to cure cancer, the fact remains that there is an appropriate time to declare war on cancer and an inappropriate time. If the war cannot be won, it should not be declared." But, "those who are in the field and can best tell whether a 'war' is capable of being won are the same people who most benefit from having a 'war' declared."

**THE MIT ECONOMIST** advised that funds for basic research should be based on an analysis of "how much it costs to keep enough R&D personnel in an area to be aware of any breakthroughs that might occur and to be able to expand rapidly should each breakthrough actually occur."

The report, noted Proxmire, also pinpointed the following concerns about federal research funding:

- An arbitrarily heavy concentration of R&D funds in military and space activities compared with the amount spent for civilian research.
- Inadequate opportunity for state and local governments to exercise input into federal R&D priming.
- The need to stimulate additional scientific investment in the private sector.
- Overemphasis on "high technology" fields such as aircraft, electrical equipment and instruments, even though "economic and social benefits to the public may be higher in less exotic areas like textiles or machine tools."

**A SPOKESMAN** for the newly established White House Office of Science and Technology Policy said that the President's science adviser had not yet had an opportunity to review the Proxmire subcommittee's report.

But, he said, a two-year survey to review the overall federal science and technology research establishment and make appropriate recommendations is already getting under way.

C. F.  


THE WHITE HOUSE

WASHINGTON

November 19, 1976

MEMORANDUM FOR: The President

SUBJECT: Senator Proxmire's Press Release on Research Spending

The press release by Senator Proxmire reported in the "Washington Star" is based on five studies prepared for the Joint Economic Committee. Each addresses one or another element of the decision process for allocation of funds or establishing and evaluating priorities in Federal research and development. The studies reflect the general concern of the JEC subcommittee on priorities and economy in government. The study papers investigated:

- The relationship between defense-related and civilian related research and development priorities
- Senate procedures for authorizing military research and development
- Observations on the effectiveness of Federal civilian-oriented research and development programs
- The relationship between Federal, state and local government for research and development
- Federal support of R&D activities in the private sector

The press release and hence the Star story are somewhat inaccurate in that the Senator purportedly said the above studies identify "serious and startling shortcomings in the way Federal research and development funds are allocated and spent." The authors of the five papers wrestle with the rather well known difficulties of allocating R&D funds including the most pressing one of how one can determine whether research will be successful when results may be years away. The Senator also criticizes the mix or composition of Federal R&D expenditures suggesting that there is an arbitrarily heavy concentration of R&D in military and space activities and (what amounts to the same thing)

over-emphasis on "high technology" fields (e.g., aircraft and electronics).

Senator Proxmire is correct when he suggests that "techniques have not yet been developed to measure the results of Federal R&D programs." We do see outputs of R&D such as nuclear energy generation of electricity, medical advances on a wide front and increasingly effective military hardware. But we do not have exact quantitative measurements of the benefits of R&D. Further, quantitative estimates of the benefits of a superior fighter aircraft cannot be compared with quantitative benefits of a Federally sponsored medical advance. The same problem faces industry where 75-80% of the fundamental or applied research projects sponsored by industry may fail on technical or market grounds.

As you know, we cannot measure the outputs of basic research easily because there is no readily applicable unit of measurement such as dollars. Basic research results in new knowledge in many different fields. In general, at the time of discovery the eventual "value" of basic research results is rarely known.

The Joint Economic Committee and the Congress in general share the Administration's concern for improving both measurement and evaluation of R&D outputs and the efficiency of the R&D process. Both the Administration and the Congress continue to improve the R&D decision-making process. In 1977 and in the current review OMB has sought to improve decision-making with respect to R&D programs. The most recent analysis of support for basic research and the decision process--just prepared for OMB Director Lynn--is a short paper examining the current decision process and several alternatives that seem less satisfactory. (This paper - or a derivative - will probably be in the "issue book" accompanying your 1978 budget.)

There is excellent interaction between OMB and the new Office of Science and Technology Policy on R&D issues in the 1978 budget. I will continue to work closely with OMB for I believe the budget process is the best "tool" for the systematic review of allocations for Federally sponsored research and development.



H. Guyford Steyer  
Science and Technology Advisor