DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
WASHINGTON, D C 20301

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12 JUL 1974

Honorable Patricia Schroeder
House of Representatives
Washington, D. C. 20510

Dear Ms. Schroeder:

I am replying to your inquiry of June 20, 1974, in reference to a letter from Professor Willard Bennett of North Carolina University.

Professor Bennett rightly points out that there is little incentive for researchers in government laboratories or operating under government contract to patent the results of their work. There is little possibility of personal monetary gain from such patents. There is a further social constraint in that most researchers in these organizations consider themselves scientists rather than inventors and are therefore not inclined to seek patents. We do not believe that the number of patents produced is a direct measure of the impact of defense funded research.

I have included a table which summarizes federal R&D funding changes in the U.S. from 1964 to 1974 as set forth in the National Science Foundation (NSF) document "Federal Funds for Research, Development and Other Scientific Activities." An analysis of the data shows that annual federal R&D expenditures for the last ten years have risen both in-house and with educational institutions; in fact, the educational institutions have slightly increased their fraction with respect to the intramural laboratories. There is no reason to believe the situation will change markedly in the near future. As you can see, there is no apparent diversion of funds from the universities in the overall federal R&D budget. The budget, of course, is made up of a large number of individual terms, each having its own dynamics, each subject to different pressures and, when viewed at a small enough level, influenced by individual decisions.

DDR&E

In considering the universities, it is most appropriate to review those portions of the budget which are identified as "research" rather than "research and development". As the table shows, research accounts for the bulk of the funding going to universities since the universities seldom compete for the development of major systems. In this area also, there has been no change in the last ten years in the ratio of intramural-to-educational expenditures.

When looked at from the point of view of the DoD alone, there have been significant changes: both an increase in the cost of operating the in-house laboratories and a decrease in the total funds going to

Prep by : LtCol Whitaker/ OAD(E&PS)/ Rm. 3D 1079/ 79216/ me/ 8 Jul 74

universities. The same trend is evident, although somewhat less pronounced, in the category termed basic research which is the area primarily addressed by Professor Bennett. A further breakdown by individual Service puts the numbers on such a scale that we can identify individual events making up the changes. The basic research program of the Army Research Office was severely cut back as a result of reaction to the Mansfield Amendment on the relevance of defense research. The Office of Naval Research program, on the other hand, increased its university participation relative to that of the in-house laboratories. Air Force in-house laboratory expenses grew during this period, although the university program of the Office of Scientific Research remained relatively static. There is one development laboratory in the Air Force which for historical reasons is supported out of the basic research budget. The rise in personnel costs and salaries during this period is reflected therefore disproportionally in this item. Except for these two latter items, over the past ten years, the DoD basic research budget would have been as unchanged in distribution of performers as in total amount.

Similarly the total DoD research budget has been perturbed by several large university programs having been transferred to other organizations. For instance, the Draper Laboratory at MIT, which was run by the university, is now an independent for-profit organization; much of the materials work previously supported by the Defense Advanced Research Projects Agency has been taken over by the National Science Foundation.

Nevertheless, it is clear that the DoD research budget, and the amount spent in educational institutions, has not risen over this period as the total federal research budget has, nor has it risen proportional to inflation. As a result of previous Congressional budget actions, the DoD has restricted its budget requests in this area while attempting to maximize its return on investment through extremely careful management of what we regard as a precious resource. Our research management has necessarily become more exacting as budgetary pressures have increased but I do not believe it merits Professor Bennett's characterization of meddling and destructive interference.

Finally, it must be remarked that Congress has questioned whether much of the basic research sponsored by the Department of Defense should be supported instead by the National Science Foundation. A fair amount of such research has been transitioned to that agency, the DoD further emphasizing work of more specific impact.

Perhaps a fairer view of the total federal impact in this area might be to consider the last item in our table listing the sum of DoD and NSF basic research. The Department of Defense does depend very strongly

on the scientific base supported by the National Science Foundation although the defense impact of dollars spent in less directed research is diminished. Finally, I might remark that the period chosen, the ten years from 1964 to 1974, is a particularly illuminating one from the point of view of the Department of Defense since the research budgets are almost identical for these years. There are some significant excursions, both positive and negative, around 1970 which make a comparison based in that time period much more difficult to interpret.

I hope this information is of assistance in replying to Professor Bennett and in allaying your own concerns. Similar information has been provided to Senator Thurmond.

Sincerely,

/s/ Robert N. Parker
for

Malcolm R. Currie

	FY 1964	FY 1974
	(Dollars in Millions)	
Total Federal R&D	$14,133M	$17,383M
Intramural	$ 2,828M	$ 4,798M
% of total Federal R&D	20%	28%
Educational Institutions	$ 1,061M	$ 1,956M
% of total Federal R&D	8%	11%
Intramural/Educational Ratio	2.7	2.5
Total Federal Research	$ 4,541M	$ 6,794M
Intramural	$ 1,331M	$ 2,252M
% of Federal Research	29%	33%
Educational Institutions	$ 998M	$ 1,708M
% of Federal Research	22%	25%
Intramural/Educational Ratio	1.3	1.3
DoD Research	$ 1,771M	$ 1,874M
Intramural	$ 560M	$ 772M
% of DoD Research	32%	41%
Educational Institutions	$ 269M	$ 182M
% of DoD Research	15%	10%
Intramural/Educational Ratio	2.1	4.2
Federal Basic Research	$ 1,574M	$ 2,421M
Intramural	$ 368M	$ 624M
% of Federal Basic Research	23%	26%
Educational Institutions	$ 552M	$ 915M
% of Federal Basic Research	35%	38%
Intramural/Educational Ratio	.67	.68
DoD Basic Research	$ 260M	$ 274M
Intramural	$ 82M	$ 116M
% of DoD Basic Research	32%	42%
Educational Institutions	$ 125M	$ 113M
% of DoD Basic Research	48%	41%
Intramural/Educational Ratio	.66	1.0
Army Total	$ 51M	$ 56M
Intramural	$ 22M	$ 30M
Educational Institutions	$ 22M	$ 16M
Navy Total	$ 91M	$ 89M
Intramural	$ 34M	$ 31M
Educational Institutions	$ 40M	$ 46M
Air Force Total	$ 84M	$ 92M
Intramural	$ 23M	$ 50M
Educational Institutions	$ 34M	$ 33M

	FY 1964	FY 1974
	(Dollars in Millions)	
Other DoD Total	$ 34M	$ 37M
Intramural	$ 3M	$ 4M
Educational Institutions	$ 28M	$ 18M
DoD plus NSF Basic Research	$ 423M	$ 674M
Intramural	$ 94M	$ 128M
% of DoD plus NSF Basic Research	22%	19%
Educational Institutions	$ 244M	$ 443M
% of DoD plus NSF Basic Research	58%	61%
Intramural/Educational Ratio	.39	.29

Funds not to intramural or educational institutions go to industry, non-profits, Federal Contract Research Centers, etc.

COVERING BRIEF

9 JUL 1974

TO: Director of Defense Research & Engineering

FROM: Deputy Director (Research & Advanced Technology) J. McC

Problem: To respond to Senator Thurmond and Representative Schroeder in reference to inquiries by Professor Willard B. nnett, North Carolina University.

Discussion: Professor Bennett has made numerous inquiries. The accompanying responses are detailed. It is suggested that this information be used for other inquiries of this type.

Recommendation: Signature on attached letters.

Coordination: OASD(LA) Geo. Seymour

Prep by: LtCol Whitaker/OAD(E&PS)/ Rm. 3D1079/79216/me/ 8 Jul 74

DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
WASHINGTON D C 20301

1 Jul 1974

Honorable Strom Thurmond
United States Senate
Washington, D.C. 20510

Dear Senator Thurmond:

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Professor Bennett rightly points out that there is little incentive for researchers in government laboratories or operating under government contract to patent the results of their work. There is little possibility of personal monetary gain from such patents. There is a further social constraint in that most researchers in these organizations consider themselves scientists rather than inventors and are therefore not inclined to seek patents. We do not believe that the number of patents produced is a direct measure of the impact of defense funded research.

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