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# Federal R & D Budget: Guns Versus Butter

U.S. scientists and engineers are generally aware that federal funding for R & D for the military has increased sharply in recent years. What is less appreciated is that federal funding for the rest of the nation's R & D effort has considerably decreased. Using words from a classic phrase, R & D funding for "guns" is up and R & D funding for "butter" is down.

The National Science Foundation compilation\* of federal R & D funding for fiscal years 1980 through 1984 by budget function, corrected for inflation with official deflators (fiscal 1984 is set at 100), reveals the following in billions of constant dollars.

Category	Fiscal year budget					Increase 1980-1984 (%)
	1980	1981	1982	1983	1984	
Total R & D	\$39.0	\$39.2	\$39.6	\$40.4	\$45.7	17
National defense	\$19.4	\$21.7	\$24.2	\$26.2	\$32.0	65
All other R & D	\$19.6	\$17.5	\$15.4	\$14.2	\$13.7	-30

Figures for fiscal 1983 and 1984 are estimates. However, the opposite trends of support are obvious. NSF lists 15 nondefense budget functions that obtain federal support for R & D. Of these, only one, general science, which is primarily basic research, shows an increase in constant dollars between fiscal 1980 and 1984; the 4-year increase is a modest 7 percent. In President Reagan's recent budget proposals for R & D for fiscal 1985, the dominance of funding for the military continues.

The rapid increase in R & D for the military is not surprising; it was almost inevitable, given the large expansion of military budgets. The surprise is the magnitude of the decrease in support of nondefense R & D. This has occurred in the face of rising concern about the international competitiveness of our industries and the need for increasingly innovative U.S. technology. One response to these concerns was passage of the Economic Recovery Tax Act of 1981, which provided U.S. industry with a 25 percent annual tax credit for incremental R & D expenditures. Partly as a result, industry funding of R & D rose between 1980 and 1984 at about 6 percent per year in constant dollars.

There are fields of effort where contributions by industry are small or fragmented and where federal support of R & D is essential. These include health (other than drugs), energy, housing, agriculture, environmental protection, and natural resources. Basic research, which supplies the fundamental knowledge on which industrial R & D builds, also requires federal support, since industry's contribution is slight.

Will the pressure for increased military R & D ease soon? The answer is almost surely no, since large increases in budgets for the military are proposed for the next several years, and there is no reason to expect the fraction for R & D to decrease. The most likely future is intensified pressure on all other federal budgets, including those for R & D. What then is to be done to obtain more adequate federal support for civilian R & D? Three efforts suggest themselves: develop more persuasive arguments to federal agencies and Congress on the need for more support for R & D in nonmilitary areas; emphasize the need for more basic research, particularly in areas that supply the scientific base for our industries; and urge greater effectiveness in the federal government's civilian R & D support programs, with less emphasis on such research spectacles as the Manned Space Laboratory and tighter constraints on the burgeoning expenditures for military R & D.

Scientists and engineers have a particular responsibility to understand these problems and make their recommendations known. What is at stake is the future prosperity of our nation.—F. A. LONG, *Program on Science, Technology, and Society*, Cornell University, Ithaca, New York 14853

\**Science Resources Studies Highlights*, NSF 83-323, 14 October 1983.