

軍事・安全保障と学術をめぐる問題について -米国の事例から

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はじめに

ニールス・ボーアと核の国際管理をめぐる問題

米国の事例から考えることの意義?

1) 米国の軍事研究と大学—歴史

i) 起源--19世紀

1862年 Morrill Land Grant Colleges Act (モリル法)

「土地付与大学」農学、工学、軍事学を教える高等教育機関の設立

ii) 制度化--20世紀初頭

科学技術、社会科学、軍事、産業（市場経済）が結びついた「知の体系」の創設

Johns Hopkins, Chicago 大学など

第一次世界大戦期の変化

National Advisory Committee on Aeronautics (航空諮問委員会 1915) ⇒

NASA(1958)へ

-ROTC の導入

iii) 飛躍—20世紀半ば以降

Office of Scientific Research and Development (科学研究開発局 OSRD 1941-47)

National Science Foundation (国立科学財団 1950) -ミッションの一つは国防

National Defense Education Act (国家防衛教育法 1958)

DARPA (Defense Advanced Research Projects Agency 1958 - 当初は ARPA)

論争① 科学の役割について

scientific democracy v. value free scientism

論争② 反戦運動の高揚--1960年代後半から1970年代

2) 米国の軍事・安全保障研究と大学 -現状

i) 連邦政府予算と R&D

基礎研究と応用研究/連邦機関-NIH, NSF, DOD

ii) 大学と DOD DOD6.1, 6.2, 6.3

Basic Research, Applied Research, Advanced Technology Development

iii) 大学とロビー活動

MIT の例 (Lincoln Laboratory)

Association of American Universities の「ロビー活動」

iv) Humanities との乖離

3) 米国の軍事・安全保障研究と大学 –争点のあり方

i) デュアル・ユースをめぐる議論 –平和利用と軍事利用？

バイオテクノロジー／貿易管理

ii) 防衛的・攻撃的の区別

Chemical /Biological Warfare Defense, Weapons of Mass Destruction Defeat

Counter IED device などの表現はあるが？

4) 米国の軍事研究から考えられること

i) 議論の土俵をめぐって

日本国憲法、国際協調主義と「積極的平和主義」

「冷戦」の遺産と日米関係

ii) 個別の問題

a) dual use の問題 –日本の文脈と米国の文脈

b) 武器の共同開発や「武器移転」の問題

武器貿易条約(2014 発効)の批准をしていない米国

日本の防衛装備移転三原則

c) academic freedom の問題

大学がやらなくても民間企業がやる？

Stuart W. Leslie, *The Cold War and American Science: The Military-Industrial-Academic Complex at MIT and Stanford*, Columbia UP, NY 1993

Rebecca Lowen, *Creating the Cold War University: The Transformation of Stanford*, University of California Press, Berkeley and Los Angeles, 1997

Andrew Jewitt, *Science, Democracy, and the American University: From the Civil War to the Cold War*, Cambridge UP, New York, 2012

Joy Rohde, *Armed with Expertise: The Militarization of American Social Research during the Cold War*, Cornell UP, Ithaca and London, 2013

DOD Research: Empowering and Supporting Our Troops in Combat



a HEMCON BANDAGE: The HemCon bandage stops hemorrhaging within minutes. Research and development funded by the Army and performed by the U.S. Army Medical Research and Materiel Command.

b INTERCEPTOR BODY ARMOR: Flexible, lightweight, highly ballistic-resistant body armor system that protects soldiers in combat. Materials and engineering design research sponsored by the Marine Corps, Army, and DARPA.

c JOINT PRECISION AIR DROP SYSTEM: Improved air delivery drops food and equipment closer to soldiers, increases survivability of aircraft personnel and supplies, makes humanitarian relief more efficient. Joint Army/Air Force research.

d LASER DESIGNATOR: Laser sights increase precision of weapons in the field. Laser research started at Bell Labs in the 1950s and later sponsored by the Army and Air Force.

LUMINESCENT POLYMERS FOR EXPLOSIVE SENSING: DOD-sponsored research has identified nanotechnologies that detect hidden improvised explosive devices (IEDs).

e MEAL, READY-TO-EAT: Advanced technologies protect food rations from deteriorating in extreme environments, enhance soldiers' physical endurance, help detect food contaminants. Army-sponsored research at Natick Soldier Research, Development and Engineering Center.

f NIGHT VISION GOGGLES: Photoelectric effect allows soldiers to see images in very low light. Current night vision technology is result of DOD research.

g SOLDIER PERSONAL DIGITAL ASSISTANT: Soldiers receive situational awareness and other information using:

- **GPS:** Basic research funded by Air Force, Navy, and AEC (now DOE) led to global positioning system, which gives a soldier's specific location anywhere in the world.
- **WEARABLE SOLDIER RADIO TERMINAL:** Provides voice communications and links soldier's personal digital assistant to FalconView software, which networks and maps soldiers on the battlefield. Research funded by several DOD offices.
- **LITHIUM PRIMARY BATTERIES:** Lighter, longer-lasting power source for soldiers built on basic research funded by DOE and applied research funded by Army and DARPA.

h SOLDIER TRAINING: Gaming technology and simulation of battlefield environments prepare soldiers for deployment and provide theater mission training. Underlying technologies developed from Army-funded basic research.

i TRANSLATION DEVICES: Highly accurate voice recognition technology allows soldiers to generate and interpret speech in other languages. Original technology resulted from DARPA-sponsored research and improved by other DOD agencies.



FY17: DEPARTMENT OF DEFENSE RESEARCH

Department of Defense (DOD)-funded basic research innovations have contributed significantly to our nation's economic and national security. DOD relies on technological innovation as a force multiplier, and cutting-edge advances have helped make our military the best-equipped and most effective in the world. Addressing complex military challenges requires innovation and new technologies. The new knowledge needed to develop such technologies depends on sustained investments in scientific and engineering basic research performed at U.S. universities.

AAU supports the 20/20 benchmark level for investments in Defense Science and Technology (S&T) and 6.1 basic research, in which investments in Defense S&T should constitute 20 percent of the total Defense RDT&E budget, and investments in 6.1 basic research should comprise 20 percent of the total Defense S&T budget (6.1, 6.2, and 6.3 programs). **AAU urges Congress to provide \$2.53 billion for 6.1 basic research and \$13.4 billion for Defense S&T, which are increases consistent with the 20/20 funding principle.**

AAU urges Congress to provide \$2.9 billion, the same as the Pentagon's FY17 budget request, for DARPA. The Defense Advanced Research Projects Agency historically has invested in high-risk, high-reward research that has led to extraordinary technological advances, such as the Internet and GPS.

6.1 basic research programs help train the next generation of U.S. scientists and engineers. Research grants and contracts support not only cutting-edge research, but also graduate research assistantships. Undergraduate scholarships and graduate fellowships funded by the National Defense Science and Engineering Graduate (NDSEG) Fellowships program help attract and retain top U.S. citizens for study in fields vital to addressing security-related challenges. AAU urges Congress to provide the

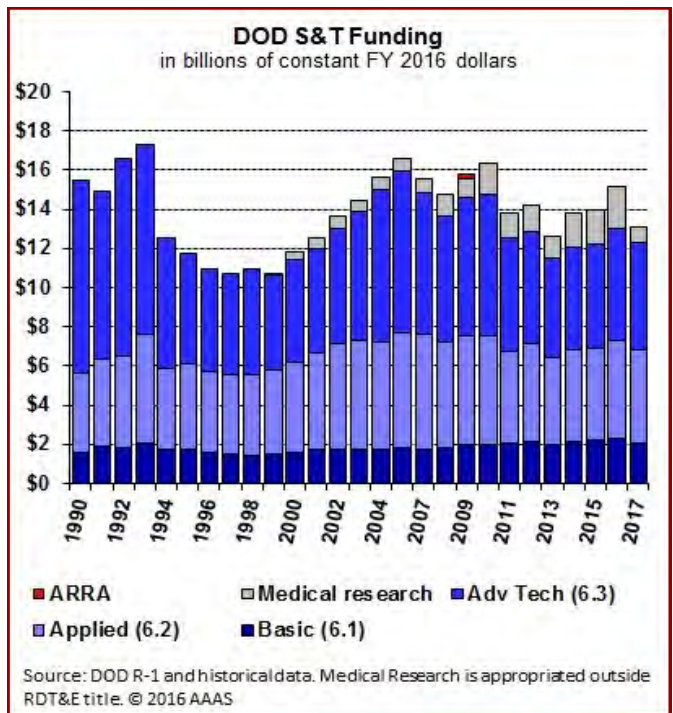
FY17 RECOMMENDATION:

AAU urges Congress to provide \$2.53 billion for Department of Defense 6.1 basic research

following FY17 funding levels, as recommended by the Pentagon:

- \$69.3 million for the National Defense Education Program (NDEP)
- \$53.5 million for NDEP's Science, Mathematics & Research for Transformation (SMART) program.

DOD basic and applied research underpins the innovative health treatments and technologies that help save lives on the battlefield and speed recovery from injuries.



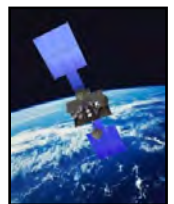
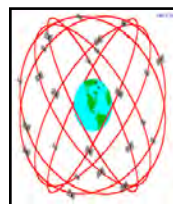
FACT SHEET:

Department of Defense Research

- **DOD relies heavily on universities to conduct research.** More than 350 universities and colleges conduct DOD-funded research. Universities receive more than 60% of DOD 6.1 basic research funding and substantial 6.2 applied research and 6.3 advanced technology funding.
- **DOD supports academic disciplines vital to national security.** DOD is the leading federal sponsor of university engineering research. DOD sponsors over half of all university research in electrical, aeronautical, and aeronautical engineering. DOD also sponsors more university research in mechanical engineering and metallurgy and materials engineering than any other federal agency. (Source: NSF Higher Ed R&D Survey, 2014).
- **DOD basic and applied research underpins the innovative health treatments and technologies that help save lives on the battlefield and speed recovery times from injuries.** For injured warfighters, this includes high technology prosthetics and other life-enhancing technologies and therapies.
- **Since 2005, DOD's SMART program has supported 1,600 students.** Approximately 900 students have already transitioned into their service commitment. *84% of them have completed their service years and continue to serve beyond their commitment.*



Defense-Funded Basic Research Enabling Progress:



1940s	1950s	1960s	1970s	1980s	1990s	2000s
Nuclear weapons	Digital computer	Satellite comms	Airborne GMTI/	GPS	Wideband	GIG
Radar	ICBM	Integrated circuits	Stealth	UAVs	Web protocols	Armed UAV's
Proximity fuse	Transistor	Phased-array radar	Strategic CM's	Night vision	Precision munitions	Optical SATCOM
Sonar	Laser technology	Defense networks	IR search and track	Personal computing	Solid state radar	Data mining
Jet engine	Nuclear propulsion	Airborne	Space track	Counter stealth	Advanced robotics	Advanced seekers
LORAN	Digital comms		C2 networks	BMD hit-to-kill	Speech recognition	Decision support

Source: Department of Defense Office of the Assistant Secretary of Defense Research and Engineering (ASDR&E)

**Table 2: Projected DOD Basic Research Funding (\$M) for FY2016:
From the President's Budget Request Submitted to Congress.**

Discipline / Agency	Army	AF	Navy	DARPA	DTRA	CBDP	DMRDP	OSD
Biology / Life Sciences	10			6				
Human Systems			17					
Biology / Medical			18					
Chemistry	10							
Propulsion		38						
Physics	16	34						
Electronics/Photonics	11	44	47	40				
Materials	7	64	58	70				
Mechanics	7							
Mechanics Structural								
Mechanics Fluid		31						
Environment								
Ocean			81					
Atmosphere and Space			25					
Environmental Science	2							
Computer, Information Sciences, Mathematics			46	132				
Mathematics	6	29						
Computing Sciences	8	17						
Information Sciences		20						
Networks	9	28						
Simulation and Training	2							
Cyber				54				
Air/Ground/Sea Vehicles			57					
Weapons			18					
Counter IED Devices			17					
Science Education Career and Outreach		24	48					
Transformative / Basic Research Challenge			21	30				
Chemical/Biological Warfare Defense						46		
Weapons of Mass Destruction Defeat					38			
Hi-Energy Laser Multidisciplinary Res Initiative		14						
Multidisciplinary Univ Research Initiatives	53	79	85					
Defense Univ Instrumentation Program	12	16	23					
National Defense S & E Graduate Program		47						
National Defense Educ Program (NDEP)								50
Social / Cultural / Human - MINERVA, HSCB	3							10
National Security S&E Faculty Fellow (NSSEFF)								35
Basic Operational Medical (in Defense Health)							7	
Total	155	484	559	333	38	46	7	94

The reported Army funding by discipline reflects only the ARO budget available for University single investigator proposal submission (budget line item HR 57), not the total Army basic research funding; from a different basic research budget line the Army also funds University Centers through special competitions. For the Navy, about 25% of the reported total basic research funding is provided to the Naval Research Laboratory. For the Air Force, about 30% is provided to the AF Research Laboratories.

Since the projected budgets in the table are parsed differently than most of the organization's program taxonomies, clear assignment of funds by academic taxonomies is not always possible. The Table should be considered a best estimate. In some cases the amount of funding in a discipline is included under other headings and is thereby unknown; physics and chemistry at ONR and DARPA are good examples.