

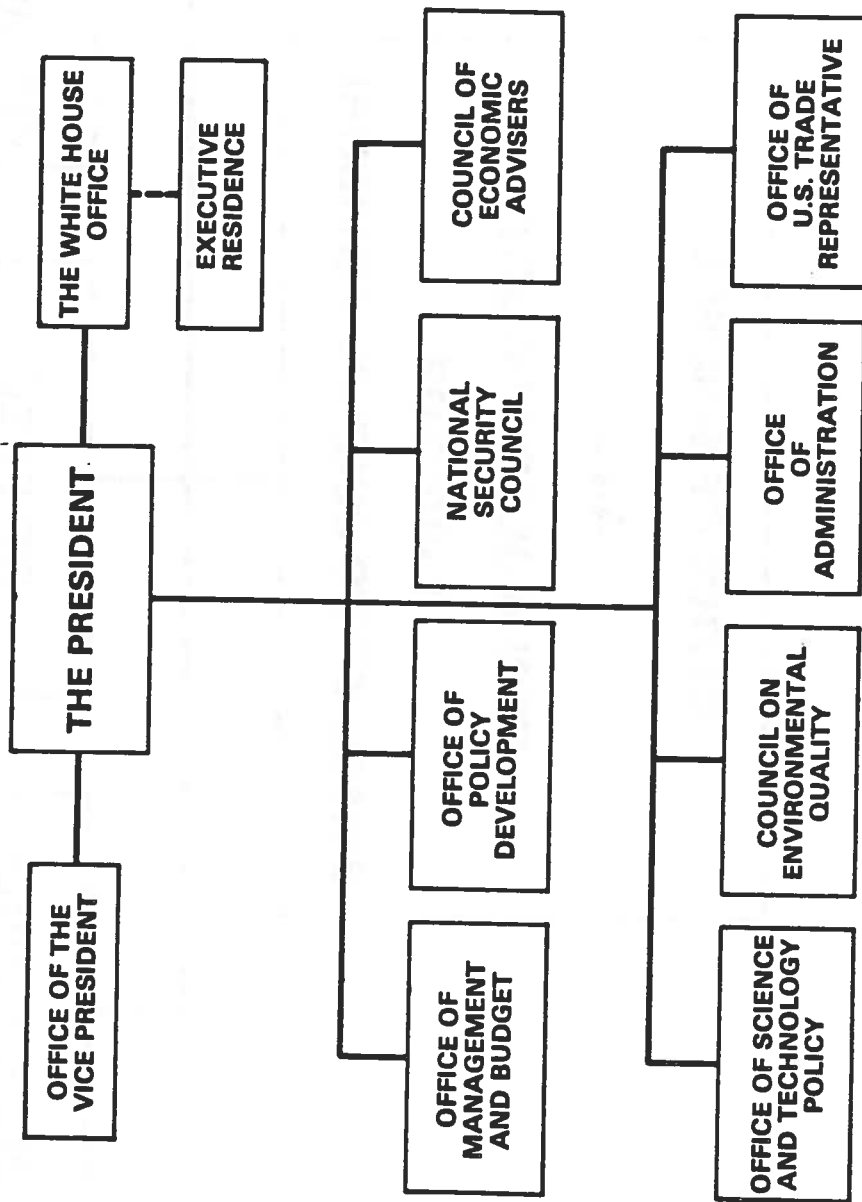
**WHITE HOUSE PERSPECTIVES
ON FUTURE AGRICULTURAL
RESEARCH AND EXTENSION**

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“CONTINUING STRONG SUPPORT FOR OUR NATION’S SCIENCE AND TECHNOLOGY HAS BEEN AND WILL CONTINUE TO BE A POLICY OF THIS ADMINISTRATION. THE GOALS OF THIS SUPPORT ARE ENHANCED NATIONAL SECURITY, IMPROVED QUALITY OF LIFE AND INCREASED INTERNATIONAL COMPETITIVENESS. TODAY MORE THAN EVER BEFORE WE MUST USE OUR TECHNOLOGICAL RESOURCES AGGRESSIVELY IN ORDER TO RETAIN INTERNATIONAL LEADERSHIP.”

— RONALD REAGAN, 1986

EXECUTIVE OFFICE OF THE PRESIDENT



JANUARY 1982

**OFFICE OF SCIENCE
AND
TECHNOLOGY POLICY
DIRECTOR
(PRESIDENT'S SCIENCE ADVISOR)**

**LIFE SCIENCES
DIRECTORATE**

**DEFENSE
DIRECTORATE**

**PHYSICAL SCIENCES
DIRECTORATE**

OSTP FUNCTIONS

1. ADVISE THE PRESIDENT OF SCIENTIFIC AND TECHNOLOGICAL CONSIDERATIONS

RE:

- **THE ECONOMY**
- **NATIONAL SECURITY**
- **HEALTH**
- **FOREIGN RELATIONS**
- **THE ENVIRONMENT**
- **RECOVERY AND USE OF RESOURCES**

OSTP FUNCTIONS

(Continued)

- 2. EVALUATE THE SCALE, QUALITY, AND EFFECTIVENESS OF THE FEDERAL EFFORT IN SCIENCE AND TECHNOLOGY AND ADVISE ON APPROPRIATE ACTIONS**
- 3. ASSIST OMB AND THE AGENCIES IN SCIENCE AND TECHNOLOGY BUDGET PREPARATION AND EVALUATION**
- 4. ASSIST THE PRESIDENT IN PROVIDING LEADERSHIP AND COORDINATION OF THE FEDERAL RESEARCH AND DEVELOPMENT PROGRAMS**

THE ADMINISTRATION'S SCIENCE POLICY

- **THE FEDERAL GOVERNMENT HAS RESPONSIBILITY FOR LONG-TERM, HIGH RISK RESEARCH**
- **BASIC RESEARCH CAN BEST BE DONE IN OUR UNIVERSITIES AND FEDERAL LABORATORIES.**

HOW DO ISSUES REACH THE PRESIDENT FOR DECISION?

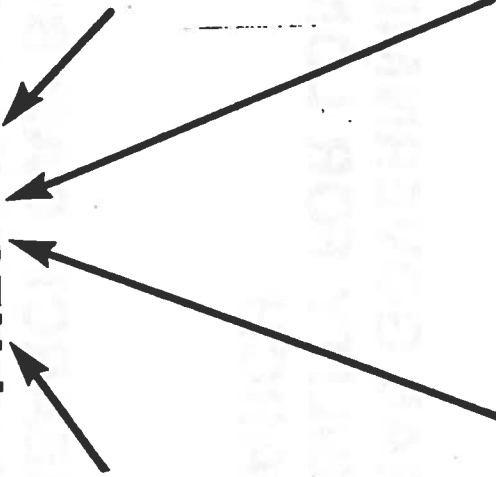
PRESIDENT

PREPARATION OF
UNIFIED FEDERAL
BUDGET

NATIONAL SECURITY
COUNCIL
(FOREIGN POLICY &
DEFENSE)

ECONOMIC POLICY COUNCIL
(ECONOMIC POLICY ISSUES)

DOMESTIC POLICY COUNCIL
(DOMESTIC POLICY ISSUE)



ADVISORY SYSTEM

**WHAT AN ADVISORY SYSTEM CAN DO IS
PROVIDE FOR INFORMED DECISIONS. THAT
SHOULD BE ITS PRIME OBJECTIVE.**

CONSEQUENCES OF CHOICE

IT IS IMPORTANT TO HAVE INFORMATION REGARDING HOW THE CONGRESS AND OUTSIDE INTEREST GROUPS AND THE PUBLIC AT LARGE WILL LIKELY REACT TO ALTERNATE COURSES OF ACTION.

ACTIONS OF THE CONGRESS

THE CONCERN MUST BE "TO PROMOTE THE GENERAL WELFARE" RATHER THAN THE PROMOTION OF SPECIAL INTEREST.

- **THE PROBLEM HOWEVER IS THAT: THE U.S. HOUSE OF REPRESENTATIVES HAS 150 SUBCOMMITTEES AND 35 CAUCUSES OR COALITIONS**

NATIONAL GOALS FOR SCIENCE

**1940'S & 50'S — MILITARY AND SPACE
TECHNOLOGY**

**1960'S & 70'S — HEALTH AND
ENVIRONMENTAL
CONCERNS**

**1980'S — IMPROVING THE
COMPETITIVENESS OF U.S.
INDUSTRIES**

FOUR GENERAL FACTORS DETERMINE INTERNATIONAL COMPETITIVENESS

- **COST OF LABOR**
- **COST OF CAPITAL**
- **STRENGTH OF CURRENCY**
- **DEVELOPMENT AND USE OF TECHNOLOGY**

ALL SECTORS

**GOVERNMENT, UNIVERSITY, AND
INDUSTRY – SHARE THE
RESPONSIBILITY FOR THE
STEWARDSHIP OF THE SCIENTIFIC
AND ENGINEERING ENTERPRISE
AND FOR ENSURING ITS
CONTINUING CONTRIBUTIONS TO
THE NATIONAL WELL-BEING.**

RELATIONSHIP

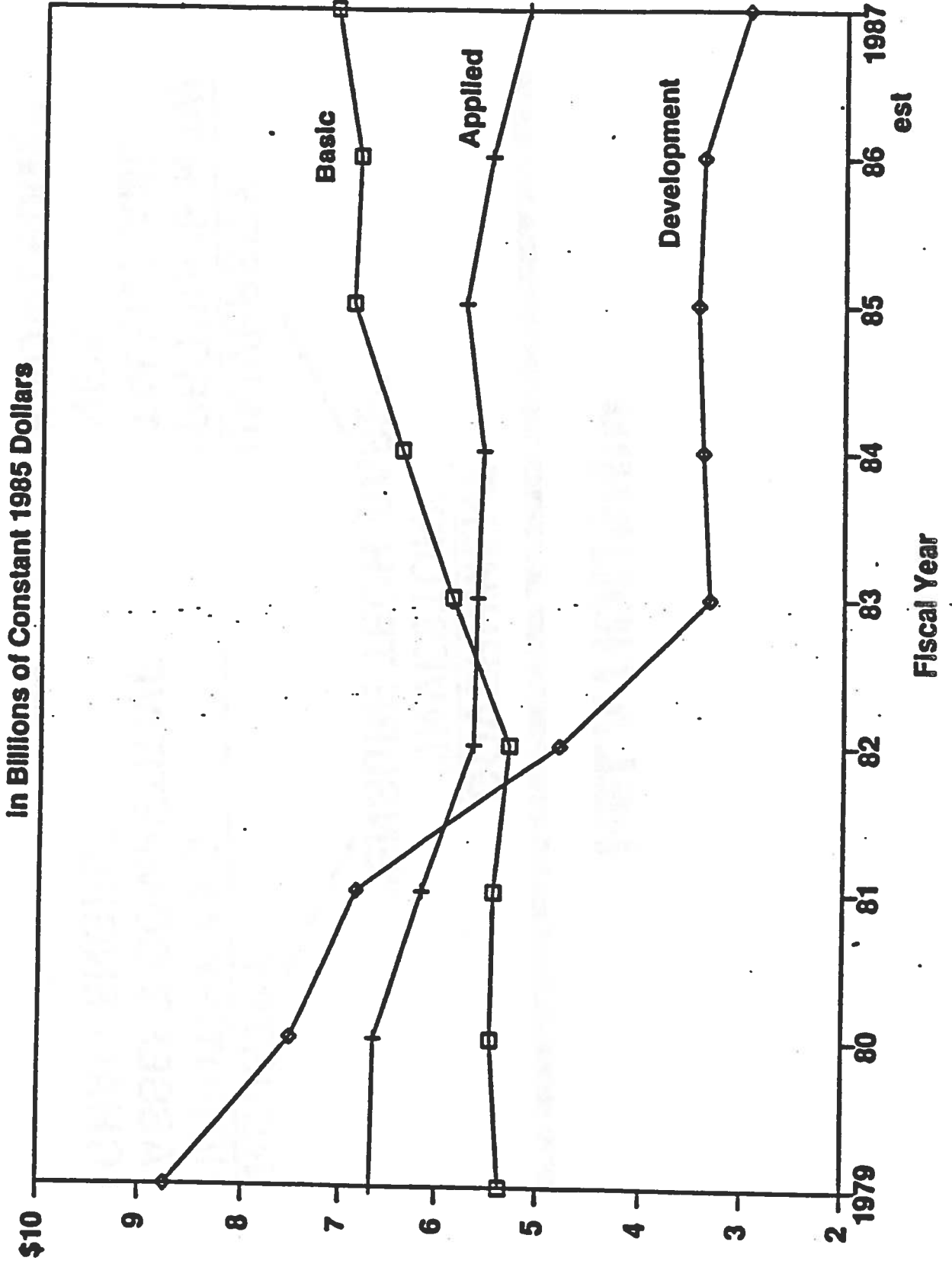
GOVERNMENT
"INVESTOR"

"ENSURE TECH BASE"

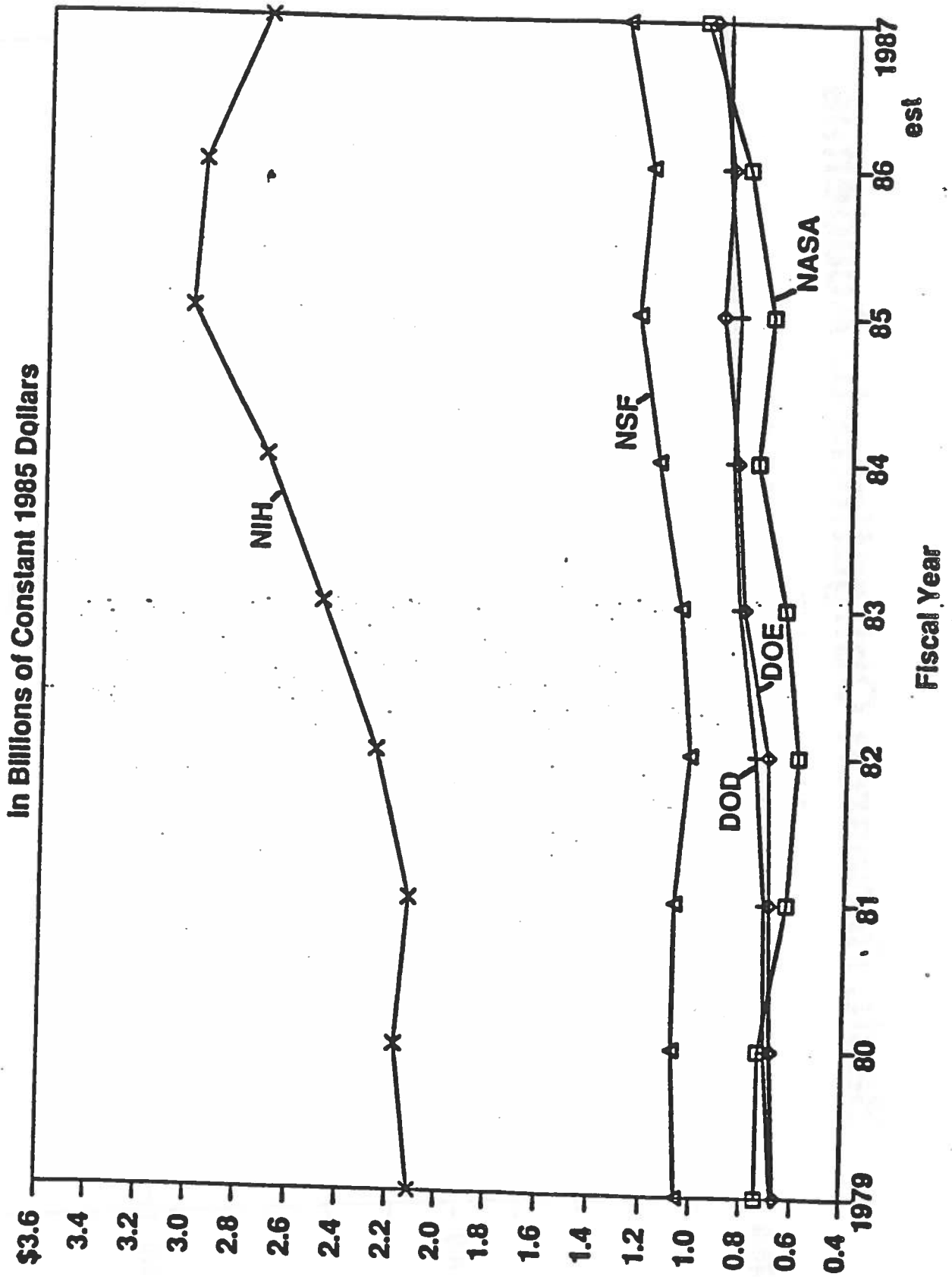
INDUSTRY
"IDENTIFY AND
ASSESS COMPETITIVE
CHALLENGES"

UNIVERSITY
"PRODUCE NEW
TALENT AND
NEW
KNOWLEDGE"

Federal R&D Obligations (Nondefense)

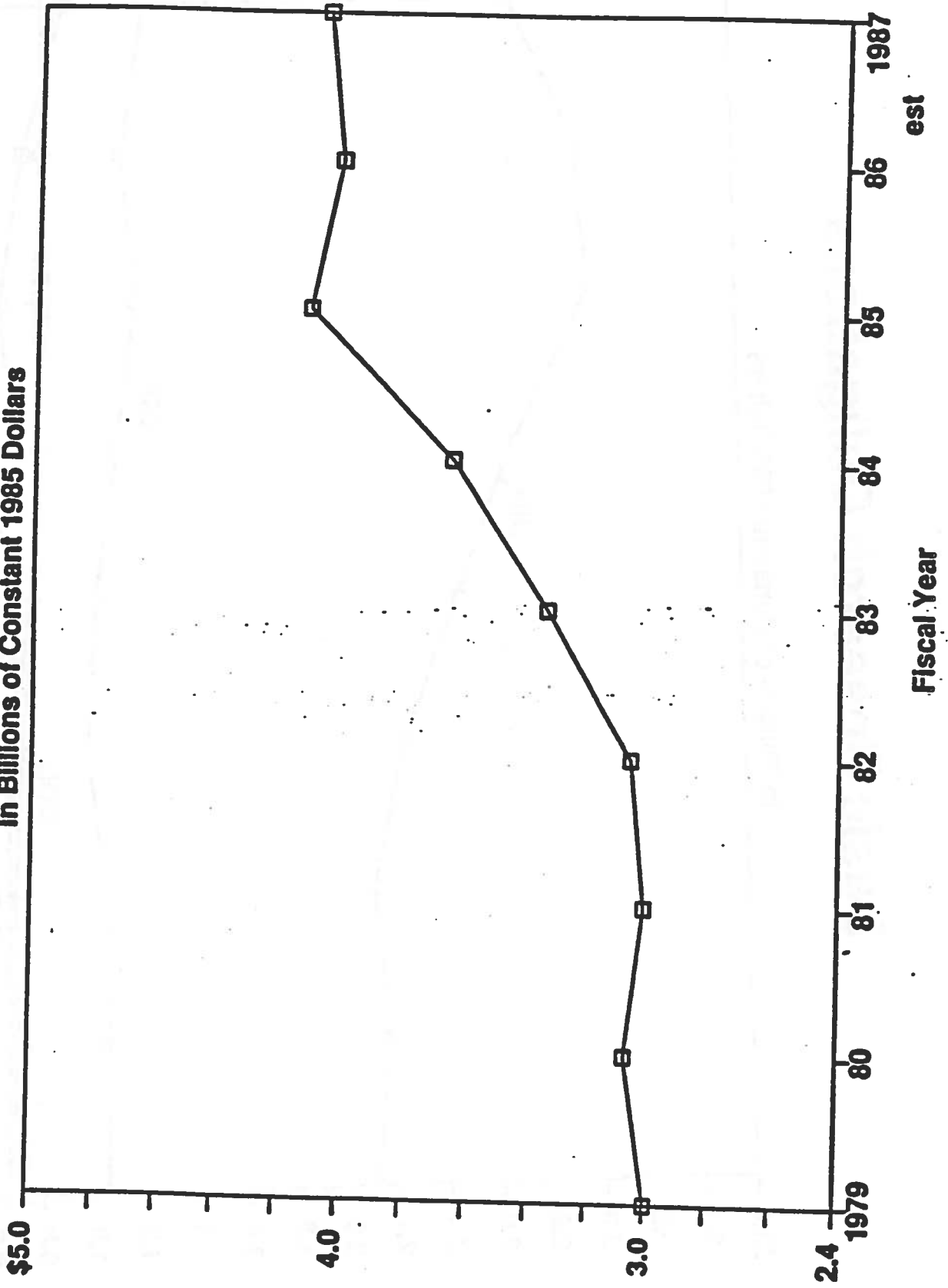


Basic Research Obligations



Basic Research Obligations to Academia

In Billions of Constant 1985 Dollars



FUNCTIONS IN THE TECHNOLOGY INNOVATION PROCESS

WORLD STOCK OF KNOWLEDGE	RESEARCH	TECHNOLOGY DEVELOPMENT	TECHNOLOGY TESTING	TECHNOLOGY ADAPTATION	(POLICY-MARKET FARM SYSTEM) INTEGRATION	DIFFUSION	COMMON PRACTICE
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- **18% OF THE NATIONS SCIENTISTS AND ENGINEERS ARE EMPLOYED IN FEDERAL LABORATORIES**

- **FEDERAL LABORATORIES HAVE A COMBINED BUDGET OF \$18 BILLION/YR**

**PRODUCTIVITY OF U.S. SCIENCE
AND ENGINEERING IS IN PART DUE
TO THE RESEARCH COMMUNITY'S
ADHERENCE TO STANDARDS OF
EXCELLENCE AND TO
INSTITUTIONAL ARRANGEMENTS
THAT HAVE ENCOURAGED
INNOVATION.**

**IS THE AMERICAN AGRICULTURAL
RESEARCH SYSTEM PREPARED TO PROVIDE
THE SCIENTIFIC AND TECHNICAL TALENT TO
PRODUCE THE NEW KNOWLEDGE NEEDED
TO REMAIN PREEMINENT IN AN AGE OF
RAPID TECHNOLOGICAL CHANGE AND
INTENSE COMPETITION?**

AGRICULTURAL RESEARCH

**"WE ARE SPENDING THE PRINCIPAL AT A
FASTER PACE THAN THE INTEREST IS
ACCRUING."**

- **ACCUMULATION OF KNOWLEDGE**
- **NATURAL RESOURCES**
- **SCIENTIFIC TALENT**

AGRICULTURAL RESEARCH

- **AGRICULTURAL RESEARCH SERVICE**
- **COOPERATIVE STATES RESEARCH SERVICE
COMPETITIVE GRANTS**
- **ECONOMIC RESEARCH SERVICE**
- **FOREST SERVICE**
- **STATISTICAL REPORTING SERVICE**
- **EXTENSION SERVICE**

**COOPERATIVE
STATE RESEARCH SERVICE**

- 58 AGRICULTURAL EXPERIMENT STATIONS**
- 17 COLLEGES OF 1890**
- 28 SCHOOLS OF FORESTRY**
- 29 COLLEGES OF VETERINARY MEDICINE**
- 42 SCHOOLS OF HOME ECONOMICS**

**UNIVERSITY-BASED
AGRICULTURAL
RESEARCH SYSTEM**

**12,500
SCIENTISTS**

**13,000 GRADUATE
STUDENTS &
POST DOCS**

**7,200
TECHNICIANS**

\$1.3 BILLION

EFFORTS OF THE AGRICULTURAL RESEARCH SYSTEM

CROPS	37%	COMPETITION & TRADE	7%
ANIMALS	20%	FOOD SCIENCE/ NUTRITION	5%
FORESTRY	13%	ALL OTHER	7%
NATURAL RESOURCES	11%		

**FUNDING FOR
STATE AGRICULTURAL
EXPERIMENT STATIONS**

STATE APPROPRIATED 53%

CSRS APPROPRIATED 19%

PRODUCT SALES 6%

INDUSTRY 10%

OTHER USDA 3%

OTHER FEDERAL 9%

**COOPERATIVE
EXTENSION
SERVICE**

**73 LAND-GRANT
INSTITUTIONS**

**3,100 COUNTIES
IN U.S.**

**2.9 MILLION
VOLUNTEERS**

\$1.0 BILLION



**“THERE IS ONLY ONE PROVED
METHOD OF ASSISTING THE
ADVANCEMENT OF PURE SCIENCE
— THAT OF PICKING MEN OF
GENIUS, BACKING THEM HEAVILY,
AND LEAVING THEM TO DIRECT
THEMSELVES”**

JAMES CONANT, 1945

EDUCATION AND TRAINING

- **ATTRACTING MOST ABLE STUDENTS**
- **PROVIDING RIGHT TALENT**
- **WILL THERE BE ENOUGH?**
- **A NEED FOR TRAINING GRANTS**

TRENDS IN TOTAL ENROLLMENT

	<u>AGRICULTURAL SPECIALIZATIONS</u>	<u>ALL HIGHER ED INSTITUTIONS</u>
1978	89,990	11,260,000
1979	89,225	11,570,000
1980	83,675	12,097,000
1981	83,530	12,372,000
1982	71,575	12,426,000
1983	67,720	12,465,000
		+ 2.8%
		+ 7.4%
		+ 9.9%
		+ 10.3%
		+ 10.7%

DEGREES AWARDED IN 1981-82

ALL INSTITUTIONS

AGRICULTURE & NATURAL RESOURCES

BACHELOR'S	953,000	22,700
MASTER'S	295,500	4,550
DOCTORAL	32,700	1,145

FOR FEDERAL SOURCE OF FUNDS WHO SETS PRIORITIES?

- **RESEARCH AGENCY?**
- **OFFICE OF MANAGEMENT AND BUDGET?**
- **CONGRESS?**

**"THE GRASS ROOTS
POTENTIAL OF SCIENCE IS
ITS GREATEST UNTAPPED
RESOURCE."**

SLADE GORTON, 1986

**JOINT COUNCIL
RECOMMENDED NATIONAL PRIORITIES**

- **AGRICULTURAL PROFITABILITY**
- **WATER QUALITY**
- **BIOTECHNOLOGY**
- **HUMAN CAPITAL**
- **NUTRITION**

USDA's FY 1985 COMPETITIVE GRANTS PROGRAM

**NUMBER OF
PROPOSALS**

2,629

**AMOUNT
REQUESTED**

\$603,153,895

**GRANTS
AWARDED**

449 SUCCESS RATE -- 17%

**AMOUNT
AWARDED**

\$44,173,800 SUCCESS RATE -- 7%

KEY RESEARCH AREAS FOR A PLANT SCIENCE INITIATIVE

- **RHIZOSPHERE DYNAMICS**
- **ECOLOGICAL PROCESSES**
- **PLANT BIOTECHNOLOGY**
- **COMPLEX CARBOHYDRATES**

**“I LIKE THE DREAMS OF THE
FUTURE BETTER THAN THE
HISTORY OF THE PAST.”**

THOMAS JEFFERSON