WHITE HOUSE PERSPECTIVES
ON FUTURE AGRICULTURAL
RESEARCH AND EXTENSION

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OFFICE OF SCIENCE & TECHNOLOGY POLICY
EXECUTIVE OFFICE OF THE PRESIDENT
WASHINGTON DC 20506
“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
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?

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.
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)

In Billions of Constant 1985 Dollars

Fiscal Year

1979 80 81 82 83 84 85 86 est 1987

Basic

Applied

Development
Basic Research Obligations

In Billions of Constant 1985 Dollars

Fiscal Year

1979 80 81 82 83 84 85 86 est 1987

NIH

NSF

DOD

DOE

NASA
<table>
<thead>
<tr>
<th>WORLD STOCK OF KNOWLEDGE</th>
<th>RESEARCH</th>
<th>TECHNOLOGY DEVELOPMENT</th>
<th>TECHNOLOGY TESTING</th>
<th>TECHNOLOGY ADAPTATION</th>
<th>(POLICY-MARKET FARM SYSTEM) INTEGRATION</th>
<th>DIFFUSION</th>
<th>COMMON PRACTICE</th>
</tr>
</thead>
</table>
18% of the nation's 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

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Crops</td>
<td>37%</td>
</tr>
<tr>
<td>Animals</td>
<td>20%</td>
</tr>
<tr>
<td>Forestry</td>
<td>13%</td>
</tr>
<tr>
<td>Natural Resources</td>
<td>11%</td>
</tr>
<tr>
<td>Competition &amp; Trade</td>
<td>7%</td>
</tr>
<tr>
<td>Food Science/Nutrition</td>
<td>5%</td>
</tr>
<tr>
<td>All Other</td>
<td>7%</td>
</tr>
</tbody>
</table>
FUNDING FOR
STATE AGRICULTURAL
EXPERIMENT STATIONS

<table>
<thead>
<tr>
<th>Source</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATE APPROPRIATED</td>
<td>53%</td>
</tr>
<tr>
<td>CSRS APPROPRIATED</td>
<td>19%</td>
</tr>
<tr>
<td>PRODUCT SALES</td>
<td>6%</td>
</tr>
<tr>
<td>INDUSTRY</td>
<td>10%</td>
</tr>
<tr>
<td>OTHER USDA</td>
<td>3%</td>
</tr>
<tr>
<td>OTHER FEDERAL</td>
<td>9%</td>
</tr>
</tbody>
</table>
COOPERATIVE EXTENSION SERVICE

73 LAND-GRANT INSTITUTIONS

2.9 MILLION VOLUNTEERS

3,100 COUNTIES IN U.S.

$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
<table>
<thead>
<tr>
<th>Year</th>
<th>Agricultural Specializations</th>
<th>All Higher Ed Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td>89,990</td>
<td>11,260,000</td>
</tr>
<tr>
<td>1979</td>
<td>89,225 (− 0.8%)</td>
<td>11,570,000 (+ 2.8%)</td>
</tr>
<tr>
<td>1980</td>
<td>83,675 (− 7.0%)</td>
<td>12,097,000 (+ 7.4%)</td>
</tr>
<tr>
<td>1981</td>
<td>83,530 (− 7.2%)</td>
<td>12,372,000 (+ 9.9%)</td>
</tr>
<tr>
<td>1982</td>
<td>71,575 (− 20.5%)</td>
<td>12,426,000 (+ 10.3%)</td>
</tr>
<tr>
<td>1983</td>
<td>67,720 (− 24.7%)</td>
<td>12,465,000 (+ 10.7%)</td>
</tr>
<tr>
<td>Degree Level</td>
<td>All Institutions</td>
<td>Agriculture &amp; Natural Resources</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Bachelor's</td>
<td>953,000</td>
<td>22,700</td>
</tr>
<tr>
<td>Master's</td>
<td>295,500</td>
<td>4,550</td>
</tr>
<tr>
<td>Doctoral</td>
<td>32,700</td>
<td>1,145</td>
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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

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Amount Requested</th>
<th>Amount Awarded</th>
<th>Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Proposals</td>
<td>2,629</td>
<td>$603,153,895</td>
<td>$44,173,800</td>
<td>17%</td>
</tr>
<tr>
<td>Grants Awarded</td>
<td>449</td>
<td></td>
<td></td>
<td>7%</td>
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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