

Originally Processed With FOIA(s):
2005-0336-F

FOIA Number:
2005-0336-F

FOIA MARKER

**This is not a textual record. This is used as an
administrative marker by the George Bush Presidential
Library Staff.**

Record Group/Collection: George H.W. Bush Presidential Records
Collection/Office of Origin: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files

OA/ID Number: 62034
Folder ID Number: 62034-002

Folder Title:
Industrial: General [2 of 7] [1991]

Stack:

Row:

Section:

Shelf:

Position:

0

0

0

0

"CORRESPONDENCE TRACKING"

TYPE: ACTION DOCUMENT NUMBER: 9124056
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: OLIVER, Bernard M.: HEWLETT-PACKARD COMPANY

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 09/10/91

SUBJECT: RE: S279, A BILL AIMED TO LEGISLATE FUEL ECONOMY IN
AUTOMOBILES.

DIRECTORATE STAFF
ASSIGNED: D. Allan Bromley ASSIGNED: DAB

ACTION
REQUIRED: AS NECESSARY

STAFF
ACTION:

SENDER'S DUE DATE: STAFF DUE DATE
OSTP DUE DATE: 09/30/91
DATE COMPLETED: DATE COMPLETED/DEPT:

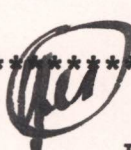
COPIES TO: INDUSTRIAL
Carl Bretscher

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

CLOSED

OSTP RECEIVED: 09/17/91 FILE: P-INDUSTRIAL
DEPT RECEIVED:

Karl gave you a
memo on this
(attached). Are
you going to
respond? Shall
I ask Karl to
respond?

 10/4

THE WHITE HOUSE
WASHINGTON

December 2, 1991

Dear Barney:

It is good to know that at least the SETI activities are progressing but I could not agree with you more that we seem to have a steady stream of difficulties emerging from various parts of the House and Senate.

This is particularly true with respect to the CAFE Bills which go happily on their way without any significant concern for either scientific or economic feasibility. There are some who appear to think that legislating a particular MPG will necessarily make it possible and others who feel that no price is too great to achieve a figure bigger than any that has ever been suggested anywhere else on the planet.

Thus far, we are doing our best to fight off these Luddite moves that could indeed wreck our domestic automobile industry.

Letters such as yours addressed to appropriate people in the Congress, are among the most effective weapons that we in the scientific community have at our disposal. I am learning more and more that a single, thoughtful, letter from a credible scientist carries enormous weight in the Congress where such letters are all too few. So I urge you to attack ignorance, bias, and sheer foolhardiness whenever you find them rearing their heads.

We continue to fight what we hope is a good fight and we deeply appreciate the support of people like yourself.

With warmest best wishes,

Sincerely yours,



D. Allan Bromley
The Assistant to the President
for
Science and Technology

Dr. Bernard M. Oliver
Vice President Emeritus
Hewlett-Packard Company
1501 Page Mill Road
Palo Alto, California 94304

4056

HEWLETT-PACKARD COMPANY
1501 PAGE MILL ROAD
PALO ALTO, CALIFORNIA 94304

BERNARD M. OLIVER
VICE PRESIDENT
EMERITUS

September 10, 1991

1:02
DIRECTOR

Dr. David Allan Bromley, Director
Office of Science and Technology Policy
Old Executive Office Building
Washington, D. C. 20500

Dear Allan:

Senator Bryan (D-NV) is getting to be a problem. No sooner do we manage to divert his attack on SETI than he comes up with S279, a bill aimed to legislate fuel economy into automobiles. As you probably know, this bill would require each manufacturer to increase the fuel economy of its line 20% by 1996 and 40% by 2001 over that achieved in 1988.

Another proposal by Senator Johnson (D-LA) involves lower percentage increases over a 1990 base, while a bill by Representative Boxer (HR446) calls for 60% economy increases.

The patently unfair aspect of all these bills requiring uniform percentage increases rather than a uniform absolute goal, is that they penalize those manufacturers that have already done the best job by requiring future performance difficult if not impossible to achieve, while allowing the poor performers to remain so. Further, the authors of the bills seem to believe that arbitrarily low fuel consumption is possible, and that man made laws can override natural law. Why not simply legislate a higher energy per gallon of fuel?

I am writing to alert you to these bills and to the menace of the philosophy that produces them. I am sick of government by technological ignoramuses. Is there nothing we can do?

Sincerely,

Barney Oliver

"CORRESPONDENCE TRACKING"

TYPE: ACTION DOCUMENT NUMBER: 9123939
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: MARTIN, JAMES G.: GOVERNOR OF NORTH CAROLINA.

TO: DR. D.A. BROMLEY

SEP 10 1991

DATE OF
CORRESPONDENCE: 08/30/91

SUBJECT: GOVERNOR MARTIN ENDORSES A PROJECT PROPOSAL FROM THE
NORTH CAROLINA RESEARCH TRIANGLE GIS CONSORTIUM IN
RESPONSE TO YOUR INVITATION FOR POTENTIAL
DEMONSTRATION PROJECTS TO THE NATIONAL ASSOCIATION
OF COUNTIES.

DIRECTORATE STAFF
ASSIGNED: INDUSTRIAL ASSIGNED:

ACTION STAFF
REQUIRED: DRAFT FOR DAB'S SIGNATURE ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: 09/23/91 STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

CLOSED

OSTP RECEIVED: 09/09/91 FILE: P-INDUSTRIAL
DEPT RECEIVED:

THE WHITE HOUSE
WASHINGTON

September 11, 1991


Dear Governor Martin:

Thank you for your letter of August 30.

Dr. William D. Phillips, my Associate Director for Industrial Technology, along with Dr. James G. Ling and Mr. Mark F. DeSantis, also of OSTP, met on September 10 with the leadership group of the National Association of Counties here in Washington. Although I had met with the group earlier this year, my schedule prevented my attendance at the September 10th meeting.

Dr. Phillips tells me that the meeting was very productive. The group had worked hard to identify needs at the county level that could, in principle, benefit from technologies developed by Federal agencies. The identified county needs were those of Wake County, NC and Duval County, FL in the area of Regional Infrastructure and Resource Assessment; two needs in the areas of Positive Identification and in Translation Technology were identified by Los Angeles County.

I very much applaud these initiatives. Dr. Ling and Mr. DeSantis will make inquiries about possible Federal technology matches to these county needs. This may take a few weeks, but I can assure you that responses will be forthcoming.

Sincerely,

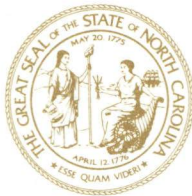


D. Allan Bromley
The Assistant to the President
for
Science and Technology

The Honorable James G. Martin
Governor of North Carolina
Raleigh, North Carolina

RECEIVED

91 SEP 6 4:18



OFFICE OF THE
DIRECTOR

STATE OF NORTH CAROLINA

OFFICE OF THE GOVERNOR

RALEIGH 27603-8001

JAMES G. MARTIN
GOVERNOR

August 30, 1991

Dr. D. Allan Bromley
Assistant to the President
for Science and Technology
Old Executive Office Building
Washington, D. C. 20503

Dear Allan:

I have reviewed with great enthusiasm a proposal to you from the North Carolina Research Triangle GIS Consortium entitled "Regional Infrastructure and Resource Assessment Center: A Proposed Transfer of Federal Technology to Local Government." The proposal, which was prepared in response to your invitation for potential demonstration projects to the National Association of Counties (NACo), represents the kind of project that can be successfully and energetically accomplished in North Carolina.

The Research Triangle region of our state offers a unique and powerful combination of resources to implement the proposal. We have a wealth of talent and experience in geographic information systems (GIS) technology, in addition to the widely-recognized tradition of scientific research.

Please accept my wholehearted endorsement of this project. I anticipate tremendous benefits to accrue to counties across the nation upon its successful completion.

Sincerely,

Jim Martin
James G. Martin

JGM:mms

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9123884

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

FROM: FREIWALD, J David A.: F2 ASSOCIATES

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/29/91

SUBJECT: RE: ATTACHED DRAFT PAPER ON LAB REALIGNMENTS.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE: STAFF DUE DATE
OSTP DUE DATE: DATE COMPLETED/DEPT:
DATE COMPLETED:

COPIES TO: INDUSTRIAL
D. Allan Bromley
Carl Bretscher

WHITE HOUSE TRACKING #: CONTACT PERSON:
REMARKS: PHONE: EXT:

OSTP RECEIVED: 09/04/91
DEPT RECEIVED:

FILE: P-INDUSTRIAL TECHNOLOGY

3884

RECEIVED

91 SEP 4 A 9:38

OFFICE OF THE
DIRECTOR

F2 Associates

10574 Livewood Way
San Diego, CA 92131
Phone (619) 578-7622
FAX (619) 549-3826
San Diego Business Cert # 88002507

29 August 1991

Dr. Alan Bromley
President's Science Advisor
OSTP - The White House, OEOB
Washington, DC 20500

Subject: Attached draft paper on Lab Realignments.

Dear Dr. Bromley:

When we lived in DC (my wife was Republican Staff Director for the House Science Committee, and I worked for MRJ, Inc.), I discussed these issues (particularly the DOE labs part) with Eric Block, Jay Keyworth (old Los Alamos buddy), and Frank Press. Eric was very enthusiastic; Jay was pushing for a cabinet-level Department of Science; Frank wanted to avoid potentially controversial issues.

Now may be the time to revisit these issues. We can garner Congressional support. Let me know if we can be of help.

Sincerely,



David A. Freiwald, Ph.D.

PS- Some biosketch info on Joyce and me is enclosed, "FYI." I am in my office by 9 am your time.

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
01a. Draft Paper	Reorganizing Our System of Government Laboratories (4 pp.)	8/29/91	(b)(1)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Industrial: General [2 of 7] [1991]

Date Closed:	3/10/2010	OA/ID Number:	62034-002
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
 P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
 P-3 Release would violate a Federal statute [(a)(3) of the PRA]
 P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
 P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
 P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Removed as a personal record misfile.

Freedom of Information Act - [5 U.S.C. 552(b)]

(b)(1) National security classified information [(b)(1) of the FOIA]
 (b)(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
 (b)(3) Release would violate a Federal statute [(b)(3) of the FOIA]
 (b)(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
 (b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
 (b)(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
 (b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
 (b)(9) Release would disclose geological or geophysical information

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
01b. Resume	Resume of David A. Freiwald [personal information redacted] (4 pp.)	8/29/91	(b)(6)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Industrial: General [2 of 7] [1991]

Date Closed:	3/10/2010	OA/ID Number:	62034-002
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
P-3 Release would violate a Federal statute [(a)(3) of the PRA]
P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Removed as a personal record misfile.

Freedom of Information Act - [5 U.S.C. 552(b)]

(b)(1) National security classified information [(b)(1) of the FOIA]
(b)(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
(b)(3) Release would violate a Federal statute [(b)(3) of the FOIA]
(b)(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
(b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
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(b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
(b)(9) Release would disclose geological or geophysical information

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
01c. Resume	Resume of Joyce Freiwald [personal information redacted] (3 pp.)	8/29/91	(b)(6)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Industrial: General [2 of 7] [1991]

Date Closed:	3/10/2010	OA/ID Number:	62034-002
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
P-3 Release would violate a Federal statute [(a)(3) of the PRA]
P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
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C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Removed as a personal record misfile.

Freedom of Information Act - [5 U.S.C. 552(b)]

(b)(1) National security classified information [(b)(1) of the FOIA]
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(b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
(b)(9) Release would disclose geological or geophysical information

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION DOCUMENT NUMBER: 9123507
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: MCGAVIN, Thomas J.: FURNAS ELECTRIC COMPANY

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/13/91

SUBJECT: THE STEADY DECLINE IN AMERICA'S LEADERSHIP POSITION
IN MANUFACTURING AND THE HOLLINGS AND BINGAMAN
BILLS.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
INDUSTRIAL

WHITE HOUSE TRACKING #: CONTACT PERSON:
PHONE: EXT:
REMARKS:

OSTP RECEIVED: 08/16/91 FILE: P-INDUSTRIAL-MANUFACTURING
DEPT RECEIVED:

Furnas Electric Company
Corporate Offices
1000 McKee Street
Batavia, Illinois 60510

Telephone 708 879-6000
Fax 708 879-0867

Thomas J. McGavin
Senior Vice President
Sales and Marketing

August 13, 1991

The Honorable D. Allen Bromley
Presidential Advisor on Science
and Technology Policy
Room 358 Old Executive Office Bldg.
Washington, D.C. 20506

Dear Mr. Bromley:

We experience the weakness of the American manufacturing position daily when we try to obtain electronic components that can only be found offshore.

The steady decline in America's leadership position in manufacturing must cease. The continuing loss of market share, the dangerously low level of investment in new plants and equipment, the surge in foreign acquisitions of some of our most advanced factories, the heavy concentration of federal R&D on defense and space showcase projects, the persistent trade deficit, the erosion of the domestic supplier base, shortage of highly-skilled workers are all attacking the economic security and standard of living of the American people.

Without a resurgence of manufacturing productivity and growth, the federal government will never garner sufficient revenues needed to eliminate the budget deficit and address America's pressing financial and domestic needs. Nor will the nation have the kind of robust domestic industrial base needed for its national security requirements and its ability to conduct an independent foreign policy.

A much closer spirit of cooperation between industry, government and academia is needed to revitalize American manufacturing. One modest, but quite concrete step in this direction is the legislation introduced by Senator Hollings (S.1330)

Furnas
The Honorable D. Allan Bromley
August 13, 1991
Page 2

and Senator Bingaman (S.1328) on advanced manufacturing technology. These bills would (a) reprioritize federal R&D spending to give much greater prominence to advanced manufacturing technologies (currently only 1.7% of the Administration's proposed \$76 billion R&D budget) and (b) provide stronger federal support for state and local industrial technology extension programs (of special benefit to the 360,000 firms with fewer than 500 employees that represent 98.5% of the total number of manufacturing establishments in the U.S.).

Since funding for these efforts would come largely out of reprogramming existing funds within the relevant agencies (Commerce, Defense, Energy, NASA, and NSF), these bills would not require significant new federal spending. They would, however, symbolize a federal commitment to join an overall national effort to modernize America's industrial base and create a new infrastructure of industry-government R&D partnerships and technical service centers.

These bills originated in the private sector, in a strategy for federal action outlined in the October 1990 White Paper, "Industrial Modernization: An American Imperative", prepared by the National Coalition for Advanced Manufacturing (NACFAM). NACFAM is a non-partisan, industry-led organization with broad national support. My organization, Furnas Electric Company, fully shares NACFAM's view that industrial competitiveness is a pressing national issue, not a partisan issue. The Hollings and Bingaman bills deserve the endorsement of both the Administration and the Congress of both parties.

Thank you for the opportunity of expressing my concern about our downward drift and I hope that through your leadership this situation can be turned around.

Sincerely,



Thomas J. McGavin

TJM:fr

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9123546

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

FROM: HAULER, Paul D.: RIT

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/12/91

SUBJECT: RE: THE STEADY DECLINE IN AMERICA'S LEADERSHIP
POSSESSION IN MANUFACTURING AND THE LEGISLATION
INTRODUCED BY HOLLINGS AND BINGAMAN.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
INDUSTRIAL
Carl Bretscher

WHITE HOUSE TRACKING #: CONTACT PERSON:
PHONE: EXT:
REMARKS:

OSTP RECEIVED: 08/21/91
DEPT RECEIVED:

FILE: P-INDUSTRIAL-MANUFACTURING

RECEIVED

August 12, 1991

91 AUG 21 A10:20

Center for Integrated Manufacturing
Studies (CIMS)
One Lomb Memorial Drive
Post Office Box 9887
Rochester, New York 14623-0887
716-475-5101

The Honorable D. Allan Bromley
Presidential Advisor on Science
and Technology Policy
Room 358 Old Executive Office Bldg.
Washington, D.C. 20506

Dear Dr. Bromley:

WE HAVE BECOME A NATION THAT IS CHARACTERIZED BY THE SYNDROME OF
"INVENTED HERE BUT MADE ELSEWHERE!"

The steady decline in America's leadership possession in manufacturing must cease! The continuing loss of market share, the dangerously low level of investment in new plant and equipment, the surge in foreign acquisitions of some of our most advanced factories, the heavy concentration of federal R&D on defense and space showcase projects, the persistent trade deficit, the erosion of the domestic supplier base, and the shortage of highly skilled workers are all attacking the economic security and standard of living of the American people.

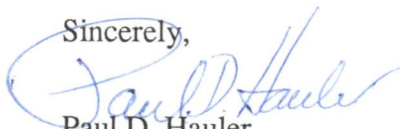
Without a resurgence of manufacturing productivity and growth, the Federal government will never garner sufficient revenues needed to eliminate the budget deficit and address America's pressing financial and domestic needs.

A much closer spirit of cooperation between industry, government, and academia is needed to revitalize American manufacturing. One modest, but quite concrete, step in this direction is the legislation introduced by Senator Hollings (S.1330) and Senator Bingaman (S.1328) on advanced manufacturing technologies. These bills would:

- Reprioritize Federal R&D spending to give a much greater prominence to advanced manufacturing technologies.
- Provide stronger Federal support for State and local industrial technology extension programs.
- These bills originated in the private sector. The Center for Integrated Manufacturing Studies at the Rochester Institute of Technology sees that industrial competitiveness as a pressing national issue, not a partisan issue. The Hollings and Bingaman bills deserve the endorsement of both the administration and the Congress of both parties.

Your support of these bills will help restore our manufacturing productivity and rekindle our "industrial engine" to secure our standard of living and our national security.

Sincerely,


Paul D. Hauler
Associate Director, CIMS

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION DOCUMENT NUMBER: 9123433
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: CAUGHLIN, T.F.: FURNAS ELECTRIC COMPANY

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/08/91

SUBJECT: RE: THE STEADY DECLINE IN AMERICA'S LEADERSHIP
POSITION IN MANUFACTURING AND ENDORSEMENT OF THE
HOLLINGS NAD BINGAMAN BILLS BY BOTH THE
ADMINISTRATION AND THE CONGRESS.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
INDUSTRIAL
Carl Bretscher

WHITE HOUSE TRACKING #: CONTACT PERSON:
PHONE: EXT:
REMARKS:

OSTP RECEIVED: 08/12/91 FILE: P-INDUSTRIAL-MANUFACTURING
DEPT RECEIVED:

Furnas

Furnas Electric Company
Corporate Offices
1000 McKee Street
Batavia, Illinois 60510

Telephone 708-879-6000
Fax. 708-879-0867

RECEIVED

91 AUG 12 P4:36

OFFICE OF THE
DIRECTOR

August 8, 1991

The Honorable D. Allan Bromley
Presidential Advisor on Science
and Technology Policy
Room 358 Old Executive Office Bldg.
Washington, D. C. 20506

Dear Mr. Bromley:

The steady decline in America's leadership position in manufacturing must cease. The continuing loss of market share, the dangerously low level of investment in new plant and equipment, the surge in foreign acquisitions of some of our most advanced factories, the heavy concentration of federal R&D on defense and space showcase projects, the persistent trade deficit, the erosion of the domestic supplier base, shortage of highly-skilled workers are all attacking the economic security and standard of living of the American people.

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A much closer spirit of cooperation between industry, government, and academia is needed to revitalize American manufacturing. One modest, but quite concrete step in this direction is the legislation introduced by Senator Hollings (S.1330) and Senator Bingaman (S.1328) on advanced manufacturing technology. These bills would (a) reprioritize federal R&D spending to give much greater prominence to advanced manufacturing technologies (currently only 1.7% of the Administration's proposed \$76 billion R&D budget) and (b) provide stronger federal support for state and local industrial technology extension programs (of special benefit to the 360,000 firms with fewer than 500 employees that represent 98.5% of the total number of manufacturing establishments in the U.S.).

Since funding for these efforts would come largely out of reprogramming existing funds within the relevant agencies (Commerce, Defense, Energy, NASA, and NSF), these bills would not require significant new federal spending. They would, however, symbolize a federal commitment to join an overall national effort to modernize America's industrial base and create a new infrastructure of industry-government R&D partnerships and technical service centers.

Furnas

August 8, 1991

Page Two

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Sincerely yours,



T. F. Caughlin, Vice President
Industrial Relations

TFC:jw

TYPE: ACTION DOCUMENT NUMBER: 9123447
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: FINK, Donald E. and Robert J. Kuntz: AVIATION WEEK & SPACE
TECHNOLOGY

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 08/01/91

SUBJECT: A SYNOPSIS OF THE JUNE 4 MEETING (OBJECTIVE: To
develop and effect a consensus agenda for tangible
policy changes that will strengthen the nation's
technological base) AND A REQUEST TO REVIEW & SELECT
RECOMMENDATIONS, ETC.

DIRECTORATE STAFF
ASSIGNED: INDUSTRIAL ASSIGNED:

ACTION STAFF
REQUIRED: FOR DAB'S SIGNATURE ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: 08/26/91 STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
NATIONAL SECURITY
PHYSICAL SCIENCES

WHITE HOUSE TRACKING #: CONTACT PERSON:
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THE WHITE HOUSE
WASHINGTON

August 19, 1991

Dear Mr. Fink:

Thank you for sending me the synopsis of your June 4, 1991 meeting on National Science and Technology Policy and the abstract of the proceedings of your November, 1990 Technology Policy Conference. I am grateful for the material. The present Administration welcomes private sector input in economic growth issues, and that is exactly the process in which you are engaged. We will certainly take your conclusions and results to date under advisement and will appreciate your keeping us advised as you further develop your ideas.

Sincerely,

A handwritten signature in dark ink, reading "D. Allan Bromley". The signature is fluid and cursive, with the first name "D." and last name "Bromley" clearly legible.

D. Allan Bromley
The Assistant to the President
for
Science and Technology

Mr. Donald E. Fink
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OFFICE OF THE
DIRECTOR
August 11, 1991

Dr. D. Allan Bromley
Science Advisor to the President
OFFICE OF SCI/TECH POLICY
Executive Office Building
Washington, DC 20506

Dear Dr. Bromley:

Global strategic defense considerations coupled with Congressional initiatives to reduce the budget deficit will continue to affect Defense Department expenditures, threatening the viability of the U.S. aerospace industry and its ability to serve the national need. Leadership in high technology, including aerospace, is crucial to carry national competitive policy strategies into the 21st Century.

The California Engineering Foundation (CEF) and Aviation Week and Space Technology magazine have identified many of the primary conditions affecting the U.S.'s aerospace industry. Last November, in Costa Mesa, California, we brought together over 100 policy makers to examine issues and develop recommendations for action in six specific areas affecting aerospace and technology. On June 4, 1991, we convened a follow-up meeting hosted by Representative George E. Brown, Jr. (D - Calif.) in Washington, D.C.

Our objective is to develop and effect a consensus agenda for tangible policy changes that will strengthen the nation's technological base. We do not intend to duplicate initiatives of other organizations, nor do we plan naive grandiose schemes for global change.

Many policy makers attended our November, 1990 conference and our June, 1991 mobilization meeting. Others, had schedule conflicts but requested to be kept informed. The strong consensus that an aggressive effort must be taken has enhanced our commitment to move this mission ahead, but we need your help. Attached is the synopsis of our June 4 meeting and an abstract of the Executive Summary from last November's technology policy conference. We ask you to read the attachments and:

- * Select and prioritize the five most important recommendations;
- * Propose and prioritize additional recommendations;

California Engineering Foundation/
Aviation Week & Space Technology
August 1, 1991
Page 2

* Identify the assistance (including financial and in-kind)
you are willing to provide to move a technology policy agenda.

Thank you for your interest and a rapid response to this letter.
We look forward to having you as a supporting member of the team.

Best Regards,


Donald E. Fink
Editor-in-Chief
Aviation Week & Space Technology


Robert J. Kuntz, Sc.D.,
President
California Engineering Foundation

/kh

WHAT IF PEACE?

National Science & Technology Policy

MOBILIZATION MEETING SYNOPSIS

June 4, 1991

Room 2325 Rayburn House Office Building

Sponsored by:

AVIATION WEEK AND SPACE TECHNOLOGY

CALIFORNIA ENGINEERING FOUNDATION

Hosted by:

GEORGE E. BROWN, JR.

Chairman

HOUSE SCIENCE, SPACE AND TECHNOLOGY COMMITTEE



CALIFORNIA ENGINEERING FOUNDATION

WHAT IF PEACE? MOBILIZATION MEETING

June 4, 1991

Room 2325 Rayburn House Office Building

Meeting Synopsis (Report date: July 9, 1991)

I. SUMMARY

Representative George E. Brown, Jr. (D-California), newly named Chairman of the House Science, Space and Technology Committee, called for renewed emphasis on U.S. technology initiatives at a recent meeting he hosted in Washington, D.C., to offer his support implementing recommendations that were generated last fall by the *What if Peace?* conference on national science and technology policy.

The *What if Peace?* conference was held in Costa Mesa, California, last November and brought together 100 delegates representing state and national legislatures, the U.S. aerospace/defense industry, a range of research institutions and laboratories, academia and various other industry associations. The conference was sponsored by the California Engineering Foundation and *Aviation Week and Space Technology* magazine.

The conference generated a lengthy list of recommendations for strengthening the national technology base and fostering the development of critical technologies needed to enhance the U.S.'s competitive edge into the next century. The Washington meeting was called as a follow-on to the *What if Peace?* conference in an attempt to narrow the focus to the most pressing policy recommendations and to chart a course of action that would result in their implementation. Participants at the Washington meeting included representatives of defense contractors, trade associations, technical/professional societies, Washington offices of major aerospace firms, and consultants, Congressional, and administration staffs, and members of Congress.

Representative Brown spoke of the major challenges facing the U.S. in light of the changing world scene and of deficiencies in the U.S.'s policy on adopting new science and technology policy directions to meet those challenges. He also offered the services of his office and asked the group for guidance in his new role as Chairman of the Science, Space and Technology Committee.

Representative David McCurdy (D-Oklahoma), a member of the

Science, Space and Technology and the Armed Services committees, and Chairman of the Select Committee on Intelligence, also met with the group and projected his views on the challenges facing the U.S. in the areas of science and technology policy and reindustrialization. McCurdy also encouraged the group to bring ideas for legislative initiatives to his office.

The meeting was chaired by Dr. Robert J. Kuntz, CEF President, who opened the session at 1:00 p.m., reviewed the agenda, summarized the objectives and abstracted the *What if Peace?* conference recommendations and introduced the speakers. Donald Fink, *Aviation Week's* Editor-in-Chief, led a discussion on the broad issues of science and technology policy with a focus on the current down-sizing of the U.S. defense industry. Details of their presentations and those of Brown and McCurdy, together with a listing of the meeting participants, are included in the summary report attached.

The group recommended several courses of action that should be taken and expressed an interest in supporting a future coordinated program. CEF was asked to identify a select number of individuals who would work as a coordinating task force.

The meeting adjourned at 5:00 p.m.

II. JUNE 4 MEETING DETAILS

Presentation by Dr. Robert J. Kuntz, President, CEF

Dr. Kuntz gave an overview of conference results (abstract attached) and provided copies of the conference Executive Summary to all participants. Kuntz discussed the fact that America has had no long range strategic policy in science and technology for over 40 years. He reviewed major decisions that were made in the void of strategic policy, such as the Congressional prohibition against NASA using military hardware for America's research during the International Geophysical Year of 1958, while the USSR launched Sputnik using a military rocket in 1957. He also discussed the Apollo moon program and the intentional destruction of all capability to return to the moon after project completion. The termination of the X-15 program was also mentioned, wherein NASA policy determined Congress would not approve a hypersonic research facility as long as the X-15 was operational. Nasa terminated the X-15 project, but Congress did not approve the new facility. America lost its high speed, high altitude test capability.

Kuntz also mentioned the periodic purging of the space and defense technical human resource capability, and intentional destruction of technological infrastructure, when the federal government changes defense and space policies. Kuntz also compared current downsizing in the aerospace industry, because of budget reductions, to those occurring early in the 1970's.

A copy of the *What if Peace?* conference Executive Summary report, containing over sixty recommendations for action by government, industry, and academe, was provided to the group. Kuntz reviewed high priority actions included in the report abstract (copy attached). Kuntz said that CEF's intent is to develop a task force and constituency which will assist in moving a consensus agenda for strategic science and technology policy, and that the June 4 meeting is another milepost in the program plan.

Comments by Honorable George E. Brown, Chairman, House Science, Space and Technology Committee

Representative Brown expressed pleasure in hosting the meeting in the House Science, Space, and Technology Committee hearing room, and his appreciation for the participants' involvement. He said the U.S. is facing a rapidly changing world requiring new policy approaches, but Congressional and administration actions do not reflect the urgency of the issues. Brown discussed the Critical Technologies program lists that have been developed by various groups, and the call by some organizations for the formation of a Critical Technologies Institute. Brown said a new policy direction for the U.S. has not been established, and he requested counsel from the group.

Brown said state and local governments must be involved and included in any future national science and technology policy. Current Congressional focus is on near-term events, and Brown mentioned the battle taking place in Congress over the U.S. space station. He indicated how the House had voted down the appropriation even for a scaled down project, with an eye toward use of the funds for social entitlements. A vote for reconsideration of the project was scheduled later in the week. Brown said that pressure is on Congress to find funds to expand social welfare programs, and lobbyists for such programs have greater political clout than supporters of space research.

Human resources development (education) is a major concern to Representative Brown. He pointed to math and science deficiencies in K-12 schools.

Brown also said that initiatives must take place to broaden the economic base in regions critically dependent upon single industries. He referenced Texas and its past dependence on oil; but over the past 10 years Texas has invested heavily in knowledge-based economic growth. Brown said the state has successfully captured a number of major research laboratories, such as SEMATECH, MCC, and the Super Conducting Super Collider projects.

Brown sees the need to create a more positive U.S. policy to permit American industry to effectively compete in the world market. Roadblocks should be removed, and Brown specifically mentioned antitrust laws that prevent closer collaboration among industrial competitors in the U.S. New laws are needed that permit American firms to collectively challenge the power of foreign competitors, according to Brown. There is also a need to reduce the cost of capital to industrial firms. Brown also called for American industry to increase quality in all processes, and mentioned the U.S. Department of Commerce's Baldrige Award as an effective means to stimulate quality industrial management.

Brown feels that Congress and industry cooperation must be improved. Finally, he said that the ruling of Judge Harold H. Greene prohibiting the "Baby Bells" from manufacturing, after AT&T divestiture, should be changed to unleash the capability that exist in these firms (reference the Telecommunications Research and Manufacturing Competition Act of 1991 - S173).

Dr. Kuntz thanked Representative Brown for his sponsorship and hosting of the mobilization meeting, arranging the meeting room, and providing refreshments. Representative Brown again requested counsel from the group in formulating long range strategic science and technology policy.

Comments by Donald E. Fink, Editor-in-Chief, Aviation Week and Space Technology

Mr. Fink provided some history to the group of *Aviation Week's* involvement in the *What if Peace?* conference. *Aviation Week* is one of the oldest aviation magazines in the world and celebrates its 75th birthday this year. The magazine has reported on the aviation, aerospace, and defense industry over the years, and has been an agent for change. Fink said major world changes, such as the revolution in Eastern Europe, and their effects on U.S. defense and economic strategy demand new thinking and long range strategy. Reductions in defense funding and the U.S. budget crisis point to a paradigm shift of major consequences for America's aerospace and defense industry. Fink expressed serious concern over the lack of action taking place in the industry, even with the realities of a new world, and said there is a need for change.

Fink also said the private sector must become proactive, and that near-term payoff and vested-interest approaches will not work. Fink said a private sector-driven strategic plan is needed to achieve full mobilization of the nation's science and technology capability. He told the group that some aerospace and defense industry leaders do not seem to grasp the magnitude of the paradigm shift and its effects on the industry. He said that there will not be a sudden resurgence of the massive expenditures for new weapon system experienced in the 1970's and 1980's. Down-sizing will take place, and the question that remains: What can be done to expand the capability of the defense industry to diversify? Fink called for a new federal policy that creates a positive environment to enable industry to convert.

Discussions with Honorable David McCurdy, member, House Science, Space, and Technology Committee

Representative David McCurdy said that new industrial policy was critical to the future of the U.S. He chairs a Congressional industrial panel which will begin hearings in July on factors influencing American industry.

McCurdy said there is great confusion in Congress and a lack of direction in the White House. He said the Administration has impeded federal support for research and development targeted on assisting and supporting commercial industry. He also said there is a cultural block to changing past policy in which federal support for research has been almost exclusively devoted to space and weapon systems.

McCurdy said translating science and technology policy into a form that legislators and their constituents can understand is difficult. For example, the person in his district making \$6.00 an hour is not interested in the space station, or a manned voyage to Mars, unless someone can tell him how this

puts bread on his table or gas in his car. The message must also be spoken in "30 second sound bites" which show a value added to the economy and an increase in the standard of living. McCurdy said there are two sides to the political issue involved: On the *conservative* side is the opposition to any national industrial policy other than defense; on the *liberal* side are social programs.

The federal budget deficit has killed most Congressional initiatives requiring appropriations for technology. Projects, such as the space station, are in conflict with housing, and homeless. Referring to his new industrial panel, and the hearings beginning in July, McCurdy said strong and broad input from the private technical sector must be related to social needs in order to be heard by Congress.

McCurdy said that the viability of any legislation on defense industry conversion will depend on the author's political affiliation and the position of the Administration on the subject. The lines of delineation on the defense side of the issue are clearer than those on the commercial side, which are quite diverse. A middle ground must be found if any Congressional action is to succeed.

Science, technology and industrial policy must become the subject of a national debate to effect consensus building, and become highly visible in the 1992 election. If not, the sci/tech issues will be difficult to resolve in light of the political pressure and public attention given to health care, security (crime, etc.), and jobs.

Looking at the federal investment in research and development, McCurdy said that the U.S., as a percentage of GNP, is declining where Japan is increasing. He said there is little elasticity in the federal budget for new research and development programs. Forty-nine percent is in federal retirement payments, 27% in defense, and 9% is interest on the national debt. This leaves only 15% for discretionary funds. McCurdy said that any examination of entitlements plainly shows the U.S. has a policy to become a geriatric welfare state.

McCurdy discussed the effect of defense expenditures on U.S. technology. He said that for years the U.S. defense industry could be credited for pushing frontiers of technology, and all sorts of spin-offs can be identified. Today, technology is being pushed by commercial industry. A major challenge is how to convince the industry that today's environment has changed. McCurdy also challenged the defense industry to increase product quality and give greater attention to cost control.

McCurdy also commented on the productivity of American industry in producing quality products from technology. He said that there is a need to bridge the gap between the research laboratory and the shop floor, that is, how can the U.S. obtain

new products out of its basic research and technology?

McCurdy also said it is becoming more difficult to define just what an "American firm" is in light of leveraged buyouts, mergers, acquisitions and establishment of foreign-owned manufacturers in the U.S. hiring American workers, paying taxes, and supporting communities.

Group Discussions on Policy Issues

The following summarizes topics covered by the participants:

- * The federal government should increase allowable expenditures for I R and D in aerospace firms.
- * U.S. industry tends to focus on technology for technology's sake. There is need to have commercial projects that force the use of technology. (This comment related to the strong show of industrial interest in the Critical Technologies programs.) Further discussion involved federal technology transfer. McCurdy felt there is a need for an industrial pull to create technology flow from the federal laboratories, and the market should be driving the process.
- * The *What if Peace?* conference Executive Summary should be analyzed to separate recommended actions by sector, i.e., federal, state, academe, and industry.
- * A science and technology policy public relations campaign should be developed and implemented. Members of Congress should be briefed about technology and its relationship to jobs, economic development, competitiveness, et al, and should be involved in public relations efforts to raise constituents' appreciation for technology.
- * Department of Defense and commercial products should move closer together. One step would be to have DoD adopt, wherever possible, commercial specifications and standards for DoD purchased parts. NASA should increase allowable I R and D by its contractors. Tax incentives should be increased for industry gifting of equipment to educational institutions. Government funding should be available to industry to educate the work force about total quality management. The National Academy of Engineering report on how engineering is practiced in the U.S. should be reviewed and policy issues addressed.
- * U.S. trade policy on intellectual property transfer licensing agreements should be modified to provide for take-backs on American based technology transferred to

Japanese firms.

- * American industry should become sensitized and take action on critical factors affecting competitiveness.
- * I R and D funding should be increased to small business firms.
- * Federal procurement policy should be changed to allow the purchase of components and systems based on performance rather design (prescriptive) specifications.
- * National industrial and technology policy should not put the federal government in a position of picking winners and losers, as was nearly the case with high density television.
- * Congress should address the growing problem of product liability litigation which is destroying initiatives to bring new products to the market. (The problem is very severe in pharmaceuticals, particularly for rare diseases, since the market is limited.)
- * Schools are encouraged to use Congressional members as commencement speakers to bring policy issues to school campuses.
- * The nation's infrastructure should be redefined to include schools, research facilities, technology, and technical human resources.
- * Federal procurement policy should be modified making the government a tough customer, seeking total quality management, and procuring on the basis of performance standards.
- * Congress should stimulate the flow of knowledge from non-Congressional sources into the drafting of new or amending of existing legislative bills.
- * Senator Bingaman is introducing several bills related to science and technology policy, conversion, technology transfer, and critical technologies. The *What if Peace?* mobilization group should provide critique and counsel on these bills.
- * A media campaign should be implemented to show how science and technology have relevance to societal needs and wants. This effort should be supported by purchasers of advertising on radio, TV and the print media.
- * The Office of Science and Technology Policy (OSTP)

would appreciate input on sci/tech policy from the mobilization group with a consensus from the different sectors, backed by an action plan for implementation. Proposals to create another bureaucracy in the federal government should be avoided. Change in government is most likely to occur in the early phase of a new administration.

- * The formation of the Critical Technologies Institute, proposed by Senator Jeff Bingaman, should be supported. The Aerospace Industries Association can provide leadership to this effort.
- * There have been many studies about the nation's competitiveness challenge. What is needed is a "fast track" movement for implementing a consensus agenda. The slow evolutionary methods of the past won't work.
- * New federal policy which stimulates long term capital investment is needed. New markets require multi-year commitments which are incompatible with the current near-term pay-off of industrial and financial industry policy.
- * The *What if Peace?* mobilization project should work with other organizations to address highly specific strategic issues to achieve success and build support for further action. A consensus memo should be prepared on these specific issues, and an endorsed paper should be sent to key members of Congress. Comments should also be sent to Senator Bingaman on his critical technologies bill.

III. GENERAL CONCLUSIONS

Discussions included national science and technology policy issues, with a focus on space and defense challenges, including:

- * Critical technologies,
- * Procurement policies,
- * Human resources development,
- * Selective conversion of defense technology and industrial capability to commercial use.
- * Application of commercial products to defense use, and
- * A major public awareness and education program to increase understanding about the relationship between science and technology and jobs.

Meeting conclusions include:

- * There is a critical need for a long term, strategic science and technology policy, in contrast to near-term actions currently controlling decision-making in

industry, government, and education.

- * Most lobbying organizations have near-term product and trade-specific agendas, but few promote long range strategic policies.
- * Congressional members and staff seek non-vested interest strategic policy assistance, and the group can be an excellent source of information. (A request was made by New Mexico Senator Jeff Bingaman's staff to have the CEF critique the senator's bills related to technology. Congressman Brown also requested guidance from the group on long range science and technology policy.)
- * The group should reach a consensus on carefully selected strategic policy actions and develop a plan to implement them. The selection should be based upon issues which will have the backing of all groups.
- * CEF should continue the *What if Peace?* project and create an *ad hoc* structure to stimulate and effect inter-organizational coordination and cooperation. (The success of this effort will be determined by the commitment and support of participants.)

IV. CLOSING

Don Fink offered the editorial pages in *Aviation Week* to motivated individuals to write about policy issues and requested such articles be sent to him. Appreciation was expressed by Dr. Kuntz and Mr. Fink to Congressman Brown for the meeting room and his involvement, and to the participants for theirs. The meeting was adjourned at 5:00 PM.

V. ASSUMED CRITERIA FOR THE PATH FORWARD

The CEF will continue to provide program leadership under the following assumptions:

- * The United States must develop a strategic policy to fully mobilize its science and technology capability in light of the world changes and its own domestic, fiscal, and security needs.
- * The future standard of living, quality of life, and ability of the United States to control its own destiny depends upon reindustrializing America. A positive national policy environment is needed to achieve this objective by stimulating private investment in high value-added enterprise that raises domestic intrinsic wealth. Only through this activity can America produce a sufficient taxable cash flow to balance the budget, correct infrastructure decay, improve environmental protection, ensure national security and reduce

international trade and payment deficits.

- * Changes in long range strategic policy are difficult to achieve by existing narrowly focused organizations, since their agendas tend to be near-term. National strategic challenges are long term, interdisciplinary, and cross all sectors.
- * Historically, the U.S. has considered the separation of powers between the public and private sectors sacrosanct except in wartime. Political realities usually keep the federal government from any national industrial policy which selects economic winners and losers. In Japan, government and industry policies are closely aligned, and strategic in nature. The task in America is to create a private-sector driven national strategic plan that creates a positive policy environment for the private sector, which allows America to compete in the international marketplace.

VI. THE PLAN

The CEF is forming an *ad hoc* task force for developing and promoting long range strategic science and technology policy and inviting individuals to participate. The group will assist in defining policy initiatives that can be backed by a mobilized constituency. CEF will provide general direction and act as a systems project office for the task force.

A trade association or aerospace/defense firm will be invited to provide support services and assist in establishing an office in Washington, D.C. as a base for the Task Force's Eastern U.S. operations. Financial resources will be needed to cover CEF costs, and firms and organizations involved will be invited to contribute.

It is not the intent of the CEF Task Force to compete with the legislative efforts of supporting organizations, rather the task force will facilitate synergism among the various other organizations concerned. This technique permits broad participation in strategic policy development yet allows individual organizations to foster their own product or industry specific agenda.

These notes were prepared by Robert J. Kuntz, Sc.D., President, CEF.

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CALIFORNIA ENGINEERING FOUNDATION
WHAT IF PEACE?
June 4, 1991 Mobilization Meeting
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Member
U.S. House of Representatives

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ABSTRACT

THE NATIONAL CONFERENCE ON SCIENCE AND TECHNOLOGY POLICY
What if Peace?

November 28 - 29, 1990

Principal Cosponsors

California Engineering Foundation
Aviation Week and Space Technology

Corporate Cosponsors

Aerojet
AT&T Network Systems
Digital Equipment Corporation
Lockheed Corporation
Northern Telecom
Pacific Bell

California Legislature Cosponsors

Assemblyman Sam Farr
Assemblyman Richard Polanco
Assemblyman John Vasconcellos
Senator Art Torres



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ABSTRACT

THE NATIONAL CONFERENCE ON SCIENCE AND TECHNOLOGY POLICY

WHAT IF PEACE?

November 28 - 29, 1990

Principal Cosponsors:

CALIFORNIA ENGINEERING FOUNDATION
AVIATION WEEK AND SPACE TECHNOLOGY

March 4, 1991

CONCLUSION

The conference brought together about 100 policy makers from industry, government, academe, and associations to examine the need for long range policy in science and technology, including commercial use of defense developed technology and defense use of commercial technology.

The U.S. government is searching for means to reduce its budget deficit. Prior to Iraq's invasion of Kuwait, defense expenditures were less sacrosanct than they had been in recent years, but the greatest influence on technological development in the United States for over 40 years had been weapons research and production. Many of the commercial innovations in air travel, computers, microelectronics, materials, systems, and controls have their origin in space and defense programs.

A major conclusion can be drawn from the What if Peace? project. To compete effectively in the new world environment, the U.S. must fully mobilize its technological capability. Changes must be made all sectors. If not, the U.S. standard of living and quality of life will continue to decline. There will be a reduction in taxable cash flow -- a crucial factor in reducing the budget, international payments, and trade balance deficits. There will also be an increasing demand for federal funds to meet social ills, many of which will result from the restructuring of the U.S. economy.

The solution is in an American policy that stimulates a substantial increase in capital and human resources investment, and effectively uses the scientific and technological base of the nation. These must be applied in high value-added enterprise that raises domestic intrinsic wealth, addresses the demands of a global market, and ensures national security.

The conference was a first step in mobilizing a constituency for change.

INTRODUCTION AND SUMMARY

The title of the conference, "What if Peace?," was selected early in 1990, when the revolution in Eastern Europe raised hope for democratization of nations that had been under a dictatorial socialism for nearly seventy years. The United States and the USSR were moving closer together rather than toward mutual annihilation.

In August, 1990, international peace and stability were jolted when Iraq invaded Kuwait and claimed territorial ownership. Sanctions were imposed on Iraq by the United Nations, and subsequently, under 12 U.N. resolutions, a consortium of nations exercised the resolution to use force in returning sovereignty to Kuwait. On January 16, 1991, air attacks on Iraqi military facilities began. On February 28, the U.N. Coalition ceased offensive actions after destroying the Iraqi military forces. The U.N. Security Council reaffirmed all prior resolutions and established conditions for a permanent cease fire. A prisoner exchange began on March 3.

With the cessation of hostilities in the Persian Gulf, and a refocus on the long term economic crisis facing America, the question, "What if Peace?" as it relates to national science and technology policy is more cogent than ever. Strategically, this question was never answered after World War II, and the nation has been involved in four military conflicts since then. The ability of the U.S. to economically pay for its military actions in the Persian Gulf, enforce the peace, assist in reconstruction, address burgeoning domestic needs, and provide leadership in a new world economy is directly linked to the technical health of the nation.

Vital policy questions arise about U.S. strategic policy in science and technology:

- * *Should the federal government establish a research and development policy to assist domestic industry in competing more effectively in the global market?*
- * *What are the military threats to America's security and how can technology respond?*
- * *What other challenges threaten U.S. independence and security, and what are the technological solutions?*
- * *How can the United States shift from the management of technology based upon military threats, to a policy based on superpower peace?*

The "What if Peace?" conference developed consensus among policy makers on strategies for government, industry, and academe to fully mobilize the nation's engineering, scientific, and technological capability. Over 60 recommendations were

made for actions in six specific areas: *defense, space, managing conversion, facilities and equipment, technology transfer, and human resources*. The following are highlights:

DEFENSE

The Administration and Congress should more clearly define the military responsibilities of the Department of Energy, the NASA, the Department of Defense, the individual military services, and other government agencies involved in the defense of the United States. Legislation should be introduced in the 1991 Congress to change defense procurement regulations to permit the purchase of commercial systems, components, parts, and processes. New legislation should also change acquisition and procurement regulations for contract controls, R and D in fixed price contracts, progress payments, and purchases of commercial products, to streamline procedures to increase program effectiveness, reduce ambiguities and overhead costs, and to improve the contracting environment for defense projects. Congress should appropriate multi-year appropriations to support advanced technologies, rapidly upgrade equipment and systems, and enable the progressive development of the next generation of defense systems.

SPACE

The Administration and Congress, with universities, industry, technical and professional societies, and trade associations, should reach agreement on a national strategic space policy that includes manned and unmanned research missions. This policy should reflect a consensus for U.S. manned and unmanned presence in space as justification for authorizing funds for any mission, including military, commercial and scientific exploration. The DoD and NASA should cooperate closely in advancing space technology to minimize redundancy and maximize investment effectiveness. Congress should establish special multi-year authorization and appropriation policies for space programs and give priority to the development of a commercial-sized, low cost, flexible, quick response booster launch system. Space program objectives should include requirements for reducing or eliminating the negative environmental impacts of space development, such as atmospheric chemical contamination and spent orbiting hardware.

MANAGING CONVERSION

Industrial firms, contracting their services to the federal government for defense and space procurements, should take the initiative to modify business cultures, hire external talent, and team with commercially-oriented companies to lead in conversion. Legislation should be introduced in Congress requiring the federal government to provide a constructive environment for conversion through modification of federal procurement and tax laws and regulations, expanded use of

reimbursable IR & D funds for multi-use applications, and removal of limits on IR & D expenditures. Congress, in the short term, should appropriate "seed" loan funds to defense contractors, following successful models such as NASA's commercialization program, to assist industry in converting federally developed technology to commercial use. State tax and regulatory policies should provide incentives to stimulate retooling of defense facilities to permit dual use or commercial enterprise.

FACILITIES AND EQUIPMENT

The National Institute of Standards and Technology should categorize and inventory government research capabilities in all federal laboratories. Legislation should be introduced in Congress requiring federal procurement law and regulations be changed to reflect a national industrial policy permitting contractors to retain excess or under-utilized government owned high-value facilities and equipment. Such regulations should include financial incentives for contractors to maintain these facilities for future use. Legislation should also be introduced in state legislatures to amend tax laws, including local real estate taxes, to reduce or eliminate assessments on idle facilities and equipment, procured under government contracts, that have potential use.

TECHNOLOGY TRANSFER

To ensure a steady supply of funding for industrially relevant technology, the President should propose and Congress implement legislation creating an office with strategic responsibility in an existing or new major federal agency. The office should fund new and established technology companies for projects, critical to the U.S. economy, that are too risky or have insufficient market to attract private capital. A percentage set-aside for small business should be maintained, and the constraints on competition in the contracting act should be removed for speedier, more efficient, and simplified procurement procedures. Congress should also establish a federal laboratory budget policy for private support and funding of federal laboratories including industry matched initiatives. All non-classified national laboratory research should be done in collaboration with industry on a cost sharing basis.

EDUCATION AND HUMAN RESOURCES

The engineering societies and trade associations should form a task force to analyze engineering undergraduate curricula, in light of engineering practice, to define the minimum entry level functional capability of engineering graduates. The analysis should focus on industrial needs and examine program content in applied technology, R & D, design, manufacturing, testing, production, communications, and marketing, in addition

to technical basic theory and fundamentals. The results should be given to representative trade, technical, and professional organizations for industry, government, and education. Legislation should be introduced in Congress to change federal procurement laws and regulations to provide recoverable overhead costs in federal contracts for conversion retraining. Priority should be given to broadening the understanding of technical personnel about commercial enterprise outside the government contracting culture.

For additional information, contact:

Dr. Robert J. Kuntz
President
CALIFORNIA ENGINEERING FOUNDATION
913 K Street, Suite A
Sacramento, CA 95814
(916) 448-5411

"CORRESPONDENCE TRACKING"

TYPE: ACTION DOCUMENT NUMBER: 9123023
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: HECKER, S.S.: LOS ALAMOS

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 07/24/91

SUBJECT: COMMENTS ON THE DEPARTMENT OF ENERGY & TECHNOLOGY
PARTNERSHIP ACT, S. 1351 BEFORE THE COMMITTEE ON
ENERGY AND NATURAL RESOURCES.

DIRECTORATE STAFF
ASSIGNED: D. Allan Bromley ASSIGNED:

ACTION STAFF
REQUIRED: COMMENT AS NECESSARY ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: 08/02/91 STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: INDUSTRIAL
Carl Bretscher

WHITE HOUSE TRACKING #: CONTACT PERSON:
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OSTP RECEIVED: 07/30/91 FILE: B-INDUSTRIAL TECHNOLOGY
DEPT RECEIVED: (Presidential)

*ms
This got here too late +
therefore I choose not
to pass along why
not just file.
D 7/31*



Los Alamos

Los Alamos National Laboratory
of the University of California

Los Alamos, New Mexico 87545

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91 JUL 30 A 9:14

July 24, 1991

OFFICE OF THE
DIRECTOR

The Honorable D. Allan Bromley
Science Advisor to the President &
Director of the Office of Science &
Technology Policy
The Old Executive Office Bldg
17th St. & Pennsylvania Ave. N.W.
Washington, DC 20506

Dear Dr. Bromley:

As you know Bill Phillips visited us at Los Alamos just a few weeks ago to talk to us about OSTP technology initiatives and the role of the national laboratories. It was very helpful to us to hear Bill's views.

Next week both you and I have been asked to testify in the Senate on the DOE Science and Technology Partnership Act. I am enclosing my written statement for your information. I would be happy to receive your comments or answer any questions you may have.

Sincerely,


S. S. Hecker
Director

SSH:dl

Enc: a/s

Cy: CRM-4, A150
File

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
02. Testimony	Comments on the Department of Energy Science and technology Partnership Act, S. 1351, by Siegfried S. Hecker (12 pp.)	7/30/91	(b)(1)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Industrial: General [2 of 7] [1991]

Date Closed:	3/10/2010	OA/ID Number:	62034-002
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
P-3 Release would violate a Federal statute [(a)(3) of the PRA]
P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

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Freedom of Information Act - [5 U.S.C. 552(b)]

(b)(1) National security classified information [(b)(1) of the FOIA]
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(b)(3) Release would violate a Federal statute [(b)(3) of the FOIA]
(b)(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
(b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
(b)(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
(b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
(b)(9) Release would disclose geological or geophysical information

Mary Cuit

"CORRESPONDENCE TRACKING"

TYPE: ACTION DOCUMENT NUMBER: 9122803
ORIGINATOR: 02 STATUS I DIRECTORATE STATUS

FROM: WHITE, Robert M.: DEPARTMENT OF COMMERCE

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 07/23/91

SUBJECT: RE: THE MEDAL OF SCIENCE TECHNOLOGY FOUNDATION; A
REQUEST TO ENCOURAGE WAYS TO MAKE THE RELATIONSHIP
WITH THEM WORK.

DIRECTORATE STAFF
ASSIGNED: ~~Michelle Van Cleave~~ ASSIGNED: *Assign to Damar*
7/29/91

ACTION STAFF
REQUIRED: FOR DAB'S SIGNATURE ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: 08/07/91 STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
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*Damar - I don't know who has been handling
this (but obviously it's not me) Perhaps you could
re-assign? Thanks -*

OSTP RECEIVED: 07/25/91 FILE: *p-* DAB-AWARDS*IND-TECHNOLOGY
DEPT RECEIVED:



2803
UNITED STATES DEPARTMENT OF COMMERCE
The Under Secretary for Technology
Washington, D.C. 20230

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01 JUL 25 11 41 03

Office
Director

July 23, 1991

MEMORANDUM TO Allan Bromley

From: Robert M. White

Subject: Medal of Technology Foundation

Thank you for your support in promoting the Medal of Technology Foundation. There are some facts about the Foundation that I mentioned at our meeting on July 22 that may help with your efforts.

First of all, the Foundation is a private, non-profit charitable organization that has already been established under IRS statute 501 (C)(3). Their charter is to promote the Medal and the winners. They propose to do this through a variety of methods including fellowships, scholarships, and educational materials. The founders are people like George Rathman, former Medalist and founder of Amgen, and Steve Burrill who serves on numerous science museum boards, individuals who are committed to the promotion of science and technology.

The fact is that this Foundation does exist, is independent of the Federal government, and is proceeding with its philanthropic mission. They have endorsed the production of videos based on the lives of the Technology Medalists for grade school children. As I mentioned, I think we should cooperate with them, as appropriate, to the greatest extent possible. It can only benefit U.S. science and technology. We should encourage our legal staffs to find ways to make this relationship work.

cc: Dr. Walter Massey
National Science Foundation

THE WHITE HOUSE
WASHINGTON

July 29, 1991

MEMORANDUM FOR ROBERT M. WHITE

FROM: D. ALLAN BROMLEY *Quar*
SUBJECT: Medals of Technology Foundation

Thank you for the memorandum of July 23, 1991 regarding the Medal of Technology Foundation.

I do appreciate being brought up to date on the Foundation, and I do believe our meeting of July 22 was informative. As you know, in my capacity, representing the President in activities involving the Medal of Science and the Medal of Technology, I encourage productive efforts to promote appropriately these awards. In addition, it is important for the Department of Commerce and the National Science Foundation to work together to ensure that both medals are promoted in appropriate ways. I therefore greatly appreciate the efforts of the Department of Commerce to work with the National Science Foundation and look forward to another splendid awards ceremony.

On the matter of the legal aspects of the Foundation, as you know we are not involved with negotiations between Commerce, OMB and White House Counsel's office. I would encourage you to work with their staff to come to some resolution of any issues that may be raised. I am most interested in these discussions. If at any time you believe it appropriate for me to assist, I would be happy to do that.

Again, thank you for contacting me. I look forward to working again with Secretary Mosbacher and Director Massey to highlight this year's Medal of Science and Medal of Technology award winners. I thought that we had reached agreement on all the relevant issues in the two meetings in my office -- but be assured that I stand ready to do whatever may be required to make this year's award ceremony a total success.

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION DOCUMENT NUMBER: 9122808
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: GOMORY, Ralph E.: ALFRED P. SLOAN FOUNDATION

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 07/22/91

SUBJECT: A COPY OF "THE US GOVERNMENT'S ROLE IN SCIENCE AND
TECHNOLOGY" BY R.E. GOMORY.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
INDUSTRIAL

WHITE HOUSE TRACKING #: CONTACT PERSON:
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OSTP RECEIVED: 07/25/91 FILE: P-INDUSTRIAL Technology
DEPT RECEIVED:

2808

ALFRED P. SLOAN FOUNDATION
SUITE 2550
630 FIFTH AVENUE
NEW YORK, N. Y. 10111-0242

RECEIVED

31 JUL 25 P 2: 48

(212) 649-1649
FAX (212) 757-5117

RALPH E. GOMORY
PRESIDENT

OFFICE OF THE
DIRECTOR

July 22, 1991

Dr. D. Allan Bromley
Assistant to the President for Science & Technology
725 17th Street, N. W.
Washington, D. C. 20506

Dear Allan:

I thought you might be interested in this, as it is a subject we are both
interested in.

Sincerely,



Ralph E. Gomory

REG/bd
enclosure

A paper given at the joint meeting of the Royal Society and the American Philosophical Society, London, May 16, 1991.

The US Government's Role in Science & Technology

by R.E. Gomory - The Alfred P. Sloan Foundation

Introduction

What I have to say today about the US government role in Science and Technology is personal and non-systematic. There will be no budget charts and very few budget numbers.

I will talk first about support of basic science, especially the individual investigator.

By any reasonable standard this has been enormously successful, and by far the most successful of the government roles. This policy of basic science support was a fruit of the post WWII period, when the great achievement of Scientists during the war, for example the atomic bomb and radar, gave both politicians and the public a feeling, and in my opinion a correct feeling, for the immense power that could be unleashed by scientific knowledge.

And this thought- science is power - which led to this policy of support, was in fact rewarded by scientific successes that have transformed and continue to transform the world

I am thinking here of the transistor, in invention that grew out of the basic understanding of solid state physics, in the same way that the atomic bomb grew out of the understanding of the atomic nucleus, or equally of molecular biology with all its remarkable revelations and all its consequences as a technology.

When we seek to justify Federal money spent on the individual investigator we have an easy task. We don't have to look forward and speculate, we only need to look back at a great history of success. And it is success whether it is measured in terms of scientific progress or in terms of advancing the material level of the world.

But like many things that are very successful, success has brought its own problems and generated its own misconceptions.

One is that Scientific Leadership is enough, the rest for example the design and manufacture of products, industrial leadership etc., that these things are relatively easy and will take care of themselves.

Today we know that is not true. or at least things are not that simple

Another problem, in my opinion, was a natural turning away from industry and its problems, even in the engineering schools, because the government money was both freer and more plentiful. And also in the engineering schools, there was in this period a tendency to emphasize the science in engineering, to characterize engineering as applied science, which it isn't, and to turn away from the complexities of design and manufacturing, while stressing and awarding prestige to the more scientifically tractable elements of engineering problems

Today we are learning from the Japanese the lesson that science is not enough and we must do other things if we are to be a significant industrial power. A lesson that was obvious to other nations looking at the US before WWII

In addition, within the basic science community itself, there are clear problems. There are high rejection rates at the science supporting agencies, such as NIH (the National Institutes of Health) and NSF (The National Science Foundation), a diminution of interest in science and engineering on the part of students, a long pipeline to the Ph.D and, some difficulty getting jobs at the other end of that long pipeline. All this despite a remarkable record of success.

In trying to understand what is going on and what to do about it we immediately encounter confusion.

Some say the answer to the high rejection rate is simple, scientists clearly do good, we should simply give them more money. We should fund

any good idea because its worth it.

Others say that the money spent on science has been in fact increasing steadily and to increase it more under the present groundrules will produce an ever increasing population of research scientists who will be claimants for the same limited number of desirable jobs, and provide still more competition for grants.

The remarkable fact is that in fact we don't know what is going on. We don't have the most basic model of the process of generating researchers. We don't know how many there are out there. We simply don't know what is happening today.

I will not disguise my own belief that we are witnessing a phenomenon of OVER not UNDER production despite the cries of alarm about the projected shortages of scientists and engineers, but it is also true that is only my belief, we don't know. We have no models, little data and no basis for acting in a rational way. What does happen is much more a political process than a thought out process.

What we would do if we had a decent picture is also unclear. What would our goals be? Is it possible to articulate goals for basic science anyway even if you have a clear picture of what is going on?

Most of us automatically reject goals that set specific aims for scientific subjects. But perhaps, as a country we could have a goal of being world class in most major fields, AND at the same time having a decent life for those who pursue basic research. Then we could see what it takes to do this, and try to get it. We could estimate, debate, and work toward such goals, but today we don't have such a process and we don't act that way.

Basic Science and the Federal Government support of it has really worked. I has undoubtedly benefitted the world. We should keep going. But we should stop flying blind, for the good of the researchers themselves as well as for the rest of the world.

II Support of Megaprojects.

Two types of Megaprojects

Next I would like to say a few words about Megaprojects. I will talk about two types of Megaprojects; those that I call real science, and those that are often referred to as science, sometimes justified as science, but aren't science.

Of the real type I would list for example, the Superconducting Supercollider, various orbiting telescopes, and other scientific satellites and space probes.

Any Megaproject has certain curious elements of natural support that the individual investigator doesn't. It is intelligible(at least compared to more general basic research) and exciting, and it spends money in someone's home district or home state, and as such it is competitive with other forms of home district government spending.

There is also what I would call support through misunderstanding. Some years ago I visited CERN and asked its director why the various governments that supported CERN did. He replied in many cases they thought that power, by which I mean a new source of power, would result. This remark may be a little exaggerated, but much support can be characterized as naive if it is not an outright misunderstanding.

Then there is the support through the on going actions of a government agency. Some years ago I was fortunate enough to visit one of our space centers. This center launches real scientific space probes that cost a few billion a year. I had the opportunity to hear their thoughts, and how they justified what they did.

Their view was very prosaic and very realistic. It was essentially that they could do anything they wanted to if they could get the support of a few key people on Congressional Committees and at the OMB (Office of Management and Budget). These excellent people were matter of fact about

it. They had a lot of good things they wanted to do, and they set about doing them year after year. They dealt with those with whom they needed to deal with to do them. Now this is not exactly peer review, and let me remind you this is billions, not millions but this is really the way it works.

It would only be fair to observe that the support of individual investigator basic research is aided by this sane institutional inertia or institutional autonomy of the agencies that support that kinds of work. It is a characteristic of our present system that the moneys spent in these different ways are not compared.

Often this kind of Megaproject is good science. But the question is, is this the right way to prioritize and spend our science money. After all two Billion a year on space probes compares with the total amount that NSF spends on individual investigators. And historically the individual investigator has been far more productive.

But really the answer to this question, is this the right way to prioritize or spend our science money, depends on the whether or not that money really is available for other uses in science and technology. People will debate endlessly the question of whether the money for Megaprojects is extra money, money that eventually will come at least in part out of other science spending, or even, as some will maintain, that it is money that attracts more money, not less, to other parts of science.

Whatever it may have been in the past, I think we are today definitely moving into an era of tight budgets and firm lids on discretionary spending. It will help us, in this new era, to know where are priorities are. The Megaprojects will not be free, in my opinion, whatever they may have been in the past. And, in thinking of the future, we should remember the fundamental political appeal of the Megaprojects. While support of the individual investigator is somewhere on everyone's list, megaprojects can come out near the top.

Then there is the non-science Megaproject. Space is the best example. Although there is also the National Aerospace Plane.

The space program originated in our race with the Soviets. Who can forget the extreme National Reaction that greeted Sputnik. Edward Teller, in his usual picturesque way, asserted that we had suffered a defeat worse than Pearl Harbor. Out of this disturbed national atmosphere came a political decision to put men on the moon. And we did put people on the moon,, and we did it to surpass the Soviets, not to settle the question of what the surface of the moon looks like.

We could wonder, given this capsule view of the origins of the Space program, whether such a program is necessary today, when the rivalry with the Soviet Union is so diminished. After all we are spending more money on the space program than the combined budgets of three NSF's and one NIH all added up.

If we did ask that question we would get more than one answer. We would be told, for example that the Space Program is:

- a) Important science
- b) That it recruits people into science
- c) That it contributes to civilian technology

These explanations are all science and technology oriented, they are all somewhat true (or slightly true), but it is clear, at least to me, that they come nowhere near justifying a 14 Billion dollar a year price tag.

We could also be told, and here I think we are closer to the truth, that the manned exploration of space, and perhaps the eventual settling of space by people, is a national goal in itself quite independent of science. But if it is a national goal, to explore or settle space in this way, then let us articulate this goal, and debate it, rather than obscuring it with scientific justification. And, if we accept this national goal, let us also decide to pursue it at a proper pace, which would not necessarily be the pace appropriate to a race with the Soviets.

In contrast to Basic Science, Space, whatever its rationale - doesn't work. or more accurately it doesn't work or perform some obvious useful

function now, in the absence of an intense Soviet-American rivalry . For this reason we need to clarify what we are doing. There is no science that could justify the enormous bill, and if the justification is something else lets talk about that and about its pace and rate of expenditure.

We should remember that Megaprojects of both types, because of their out year growth and their history of costing far more than they are originally projected to, may well have an negative effect the future of more productive science.

III Science in Support of National Goals such as Industrial Competitiveness - Weapons- Environment - Energy - Education

I will confine myself to talking about government efforts to support industrial competitiveness. since I know little about the others.

Competitiveness-

Introduction: In the U.S. in recent years we have graduated from the idea that science alone guarantees industrial leadership to the idea that science and technology plus the rapid commercialization of new ideas are what matter.

Innovation is now an important word. Time magazine had a special issue on industrial competitiveness . It was entitled "Innovation in America", almost as if innovation and industrial competitiveness were synonyms.

The Federal government is moving from a position of supporting only basic science support to a position of supporting "generic" or precompetitive technologies. Lists of key technologies abound, coming from both government and private sources (like the Council on Competitiveness) The implication of all these lists is that these are the technologies that are the keys to competitiveness.

A striking example of this emphasis on advanced technology

occurred a few years ago when high-temperature superconductivity appeared on the scientific scene. There was a major government reaction. There were public meetings with the President attending to discuss the subject of superconductivity. There was very strong sentiment that, in this area, we couldn't let the Japanese do it to us again.

Though somewhat less extreme, there was a similar reaction to the Japanese 5th generation plan, which in fact produced a world wide, as well as an American, reaction

Behind all this is the thought that getting new technologies into product is the issue, we have ideas, but others commercialize them. If it were true this view would also be very convenient, because it allows one to use a science and technology policy as a substitute for an industrial policy, and Industrial policy is a complicated and questionable subject in the US, given both the political scene, and more importantly, the history of fundamental abilities and inabilities of the American Government.

Unfortunately this (science and technology) view flies directly in the face of the facts. The US has not had an innovation problem to date, even in a commercialization sense. The industries which are making up the balance of payments deficit are textiles, automobiles, semiconductors and consumer electronics. I will not comment on textiles as I know nothing about them, but the problems in the other three have had little to do with innovation and everything to do with manufacturing.

These are not industries where we have had ideas and others commercialized them, they are all industries in which we did commercialize the original ideas and had a strong position in the grown up industry itself, but later lost our position to competitive products with superior quality, lower manufacturing cost, and to competition having a rapid development cycle leading to rapid incremental improvement in the product

To date quality, speed and manufacturing have been the real strength of the competition, rather than the much more publicized MITI advanced technology efforts, and until we face that reality we are unlikely to make

progress.

Connected with this science and technology emphasis is outcry about the poor state of the nation's schools, especially the poor test scores in science and mathematics. Once more these scores are taken as a symbol of, or a predictor of national power. If you don't have good test scores in math and science you won't have national competitiveness.

Clearly good education helps any country, as does having advanced technology, but the exclusive focus on these aspects of the competitiveness problem, or using them as a surrogate for the more complicated reality will, I think, lead to disillusionment in the long run.

Let me illustrate this by the Sputnik example. Some of us can remember the charts we were shown in the Sputnik era about Soviet science and engineering education. About how much calculus the Soviets learned in high school and the large numbers of engineers they produced, both in absolute numbers and per capita. Nevertheless we know now that didn't give them Industrial Competitiveness.

Today we see the same sorts of numbers for the Germans and the Japanese but never for the Russians. indeed if the Russians were included the simple cause and effect relationship, that is implied by these comparisons would be shattered, and we might have to look elsewhere, or at least look somewhere else in addition, for answers to the competitiveness problem.

It is far from clear what we should in this complex area of Industrial Competitiveness, but we will have to be very lucky to make progress with the present set of ideas.

This same comment, that we will have to be very lucky to make progress with the present set of ideas, holds to a greater or lesser extent in all three areas that I have talked about, the support of basic science, the Megaprojects, and science and technology for industrial competitiveness.

It far from clear what we should do in any of these areas in the end,

but I do think there is ample evidence that we should be thinking hard and in new ways about the US government's role in Science and Technology.

"CORRESPONDENCE TRACKING"

TYPE: ACTION
ORIGINATOR: 02

DOCUMENT NUMBER: 9122687
DIRECTORATE STATUS

STATUS D

DIRECTORATE STATUS

FROM: GOOD, Mary L.: ALLIED SIGNAL

JUL 25 1991

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 07/22/91

SUBJECT: A COPY OF THE ARTICLE, "SCIENCE RIVALRY, FOREIGN
'INVASION' SPARKS DEBATE" AND THE QUESTION OF
WHIETHER THIS IS A TOPIC PSAC AND NSB SHOULD
ADDRESS.

DIRECTORATE STAFF
ASSIGNED: INDUSTRIAL ASSIGNED:

ACTION STAFF
REQUIRED: FOR DAB'S SIGNATURE ACTION:

SENDER'S DUE DATE:
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OSTP RECEIVED: 07/25/91
DEPT RECEIVED:

FILE: P-INDUSTRIAL*INTERNATIONAL-JAP

"CORRESPONDENCE TRACKING"

TYPE: ACTION DOCUMENT NUMBER: 9122687
ORIGINATOR: 02 STATUS D DIRECTORATE STATUS

FROM: GOOD, Mary L.: ALLIED SIGNAL

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 07/22/91

JUL 26 1991

SUBJECT: A COPY OF THE ARTICLE, "SCIENCE RIVALRY, FOREIGN
'INVASION' SPARKS DEBATE" AND THE QUESTION OF
WHIETHER THIS IS A TOPIC PSAC AND NSB SHOULD
ADDRESS.

DIRECTORATE STAFF
ASSIGNED: INDUSTRIAL ASSIGNED:

ACTION STAFF
REQUIRED: FOR DAB'S SIGNATURE ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: 08/06/91 STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
INTERNATIONAL/POLICY

WHITE HOUSE TRACK] 7/26
REMARKS:

OSTP RECEIVED: 07/
DEPT RECEIVED:

AL-JAP

*Bae Phillips
Gene Wong
Tom Ratchford
Comments please
[Signature]*

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
03a. Letter	To: Allan Bromley From: Mary Good Re: Article on Japanese Technology (1 pp.)	7/22/91	(b)(1)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Industrial: General [2 of 7] [1991]

Date Closed:	3/10/2010	OA/ID Number:	62034-002
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
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C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Removed as a personal record misfile.

Freedom of Information Act - [5 U.S.C. 552(b)]

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Newark Star Ledger - Monday July 15, 1991

SCIENCE RIVALRY

Foreign 'invasion' sparks debate

By KITTA MacPHERSON

There are new players on the New Jersey science scene with technical savvy and financial clout, the hallmark of those with staying power.

With corporate backers that hail from countries like Japan and

STAR-LEDGER
SPECIAL REPORT

RESEARCH
New directions

— Second of a series —

Germany, these new, multimillion-dollar research and development centers are the talk of the state scientific community. The questions concern the science that will be pursued at the centers and whether "American" resources like scientific brainpower should be shared with foreign concerns in a competitive global marketplace.

Given ample funding and a long-term commitment by their corporate sponsors, research executives at many of the sites said they are modeling their efforts on AT&T Bell Laboratories, the world-famous industrial research laboratory in Murray Hill, pursuing basic research that will someday pave the way for new technologies.

Among some of the newest arrivals to the state's research and development scene is the NEC Research Institute in Princeton, a \$25 million research facility that opened two years ago, which will be a center for a team of scientists who will pursue investigations in fundamental areas of physics and computer science to expand the world's knowledge of computers and communications. Hitachi America Ltd., a wholly owned

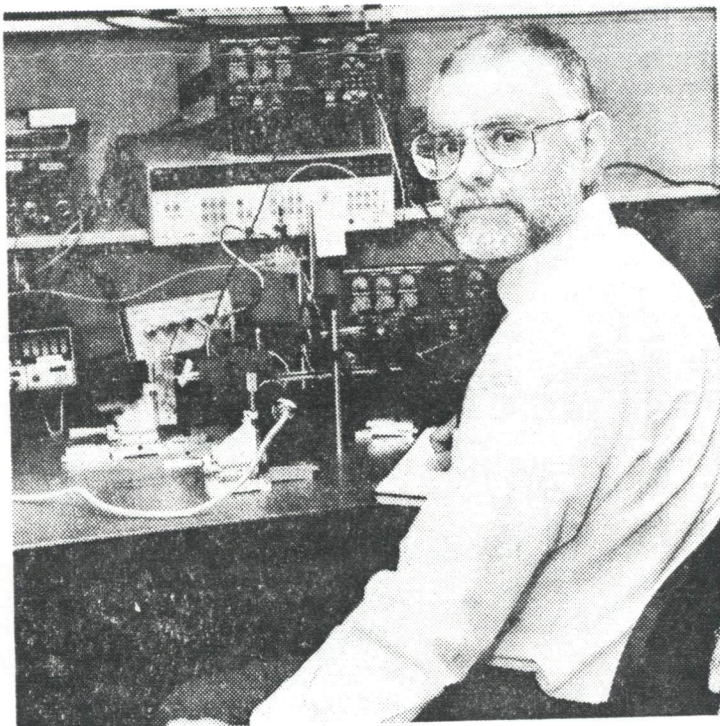


Photo by Jack S. Kanthal

Richard Linke, a senior scientist at the NEC Research Institute in Princeton

subsidiary of Hitachi Ltd. in Japan, said last month that it would open an advanced TV and systems laboratory in Princeton in early July. A laboratory to develop computer software and graphics, already operating on Nassau Street in downtown Princeton, known as the Matsushita Information Technology Laboratory, will be formally dedicated in opening ceremonies in the near future, according to company officials.

Matsushita, the parent company of Panasonic, Technics and Quasar brands, also opened its Ap-

Please turn to Page 5

Foreign 'invasion' in research sparks a debate

Continued from Page One

plied Research Laboratory in Burlington last year to study advanced television technologies. And Siemens, the German telecommunications company, opened its \$16 million research and development center in Princeton in 1988.

Depending on who is doing the talking, the action by the foreign companies represents either an obnoxious raid on American basic research talent, recognized as the best in the world, or a pleasant expansion of the New Jersey and, therefore, American research and development community. Much of the criticism is focused on the Japanese companies because of trade tensions between the U.S. and Japan.

"The future belongs to those who get the science and develop the science as high technology," said Leonard Minsky, executive director of the National Coalition for Universities in the Public Interest, a Washington-based advocacy organization. "We are talking about control of the world because that will belong to the country that controls high technology. Everybody in the world understands that. Only Americans are willing to give high technology away to their most competent competitor. And I mean give away."

The ancient model of scientific progress, in which scientists collect information, share it and thereby produce new knowledge, is being impaired, Minsky believes, by the fact that most Japanese companies do not give Americans reciprocal access to their basic research.

"They are not as stupid as we are," said Minsky, noting that the foreign-owned research divisions in New Jersey probably will not get much technical information from the foreign parent corporation. "All the research in Japan is not shared; it's a one-way street. They do most of their basic research in industry, not universities, so it is all proprietary. Their trade policies are one-way trade policies benefiting them. And they are hiring American scientists trained in all the disciplines in which America holds the leading edge."

But research executives at some of the firms, along with scientists working there, believe that such views are unfair and that they are playing the game fairly and the American way—by openly publishing their research and competing for talent.

"I'm here and I'm doing research, I am talking to American scientists and

TOMORROW: Complex science

I am publishing in American journals," said Richard Linke, a physicist who joined NEC after a 17-year career with Bell Labs in Holmdel. "What do people want? I don't understand the complaint."

In fact, by establishing such elaborate research centers replete with expensive equipment and high-paying jobs, parent companies of such American concerns do contribute to the American economy and scientific advancement, Linke believes. "It doesn't matter whether I am doing this work here or at Bell Labs, and believe me, Bell Labs worries about this too," Linke said. "If I do the work and I insist on publishing because that's what scientists require, it's entirely possible that NEC could pick up on that idea and develop it. But it's equally possible that AT&T could pick up on it and develop the work that I do here."

Linke said he understands the fear some Americans have when they see the success of Japanese car and consumer electronics companies, but he blames American industry for failing to spot whatever the success quotient should be and implement the strategy. "I think what I am doing is I am creating new knowledge and publishing it for the world to see and evaluate," Linke said. "If NEC picks up on it and does something with it, it will be better for the world. If everybody picks up on it and does something with it, so much better for the world."

Linke is not alone in his views in the scientific world. Many New Jersey scientists said they believe that such competitive concerns belong in the political realm of policy debates. "I tend to take an internationalist view of science," said Sam Treiman, a professor of physics at Princeton University. "I would like an open society here and I would like others to be open, too."

Some of the state's newest corporate neighbors are unabashed in their belief in the quality of American researchers and their ambitions to hire only the best. Princeton's Richard Lipton, a professor of computer science and one of the world's leading thinkers in the field, is taking a year's leave of absence from the university to head up Matsushita's computer science laboratory, which is located a stone's throw from the campus.

Dawon Kahng, president of the NEC Research Institute, is a Korean-born electrical engineer and physicist who had a distinguished career at Bell Labs from 1959 until his retirement in 1987. Kahng, who has set his sights on hiring about 60 scientists for the NEC lab, has already recruited 30, all from top institutions like Bell Labs, Princeton, MIT and Harvard University.

"The pool that we are selecting from is pretty much across the country; we are not just selecting people from New Jersey," said Barbara Curran, controller for finance administration at the NEC research unit. "We want nationally prominent people and it certainly doesn't hurt to say we are in Princeton."

The state's leadership in research and development—particularly because of the international reputation of places like Bell Labs, Bellcore in Livingston, the David Sarnoff Research Center in Princeton, Princeton University and the Institute for Advanced Study in Princeton—made it a natural place to settle, many said. "It's almost as though how could you go anywhere but Princeton?" Curran said.

Akira (Adam) Yokoi, vice president for technology at Matsushita Electric Corp. of America in Secaucus, said his company weighed hundreds of factors and studied the American research community very closely before deciding to base the software lab at Princeton. There was one statistic that immediately turned the tide.

"New Jersey is still highest in the number of inventions or patents produced," Yokoi said. "When you think of inventions, you may think of Silicon Valley or Boston. But it's not true. A lot of people don't know it, but New Jersey still has the highest invention rate of all the states for its total number of patents."

Yokoi's ambitions for the Princeton lab are decidedly immodest. A large investment made over the long term, he believes, could produce the world's next revolutionary high-tech product. "Matsushita has to make an investment for the future," Yokoi said. "Now we are making CDs and radios, but how about our future? People are always looking for something new, something better, something cheaper."

There is always an element of risk, he said, since there is no guarantee that a given research path will produce a product and there is always a certain amount of selling researchers have to do with corporate superiors to justify an expense. In what Yokoi describes as a "bottom line" management style, the scientists who will be doing the research come up with a proposal saying how much money they will need.

"We don't just say, 'Here's \$10 million and you examine the problem,'" Yokoi said. "That may be too small; it may be too big. The scientists and engineers who are doing the work know the best way to do it. They have to come up with the idea, how many years, how much money. Then top management will judge."

Yokoi's firm is also not interested in recruiting droves of scientists, just a few of the best ones. "Research is not like digging a tunnel where the more people you have the faster you can make the tunnel," Yokoi said. "It's about the power of the brain."

The Princeton lab, the country's eighth American research center, will focus on the development of improved computer graphics, document processing and software, areas where Yokoi said American basic research excels. Initial plans call for a staff of 20, a figure that will increase to about 60 by March 1993.

Under the lab's incentive system, scientists will be judged by how many papers they publish, Yokoi said. Though the company will own the patents produced by employees, a standard arrangement for corporate research activities, Yokoi said he doesn't expect the lab to produce many of them.

"Richard Lipton is a research scientist studying advanced computers and software whose work is so advanced we have to look five or eight years down the road," Yokoi said. "He is not developing some box we can talk about. He has lots of ideas. He is working intensively so that he can come up with something. He can't describe what. We are willing to wait for that. Something as revolutionary as a VCR could come out of this."

Part of the reason that new corporate research outfits are meeting with such success in their recruiting drives, scientists said, is that American companies for years have been cutting back on research spending.

At the NEC Research Institute, all scientists hear about is the long view, Linke said.

The research center is located in the top floor of a four-story concrete-and-glass office building owned by NEC on Independence Way off Route 1. A fountain spurts in a pond nearby, and

workers looking dreamily out an eastern window can spy NEC's brand-new volleyball court for employees. It was built at Linke's request after he became the first scientist at the institute to file a patent application. Eventually, the entire building will house research scientists, but for now, it houses other corporate tenants.

The center is dedicated to basic research without requiring a direct connection to products.

Linke, who passed up a university post to join the lab, did research in radio and X-ray astronomy at Bell Labs before moving to optical communica-

tions in 1982, his present field. "I am interested in taking advantage of what we can learn about physics to see how far we can push things."

Although his aspect of the field may sound product-oriented, he said it's not. "I am not interested in developing a better product," Linke said. "I really feel that that's not what I am good at. What I think I am good at is having a sense for which way you can push physics and which way you can't."

The new ideas introduced by such physics will influence products down the line, he said.



Barbara Curran
National talent pool



Akira (Adam) Yokoi
Cites Jersey's creativity

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
03b. Memorandum	To: Allan Bromley From: William Phillips Re: Comments on Letter from Mary Good (2 pp.)	7/29/91	(b)(1)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Industrial: General [2 of 7] [1991]

Date Closed:	3/10/2010	OA/ID Number:	62034-002
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

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C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Removed as a personal record misfile.

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Withdrawal/Redaction Sheet

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Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
03c. Fax cover sheet	To: Dan Burton From: William Phillips [handwritten notes] (1 pp.)	8/12/91	(b)(1)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Industrial: General [2 of 7] [1991]

Date Closed:	3/10/2010	OA/ID Number:	62034-002
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
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OSTP STAFFING SHEET

SUBJECT: Att. to Mary Good

ORIGINATOR: W. D. Phillips PHONE: 7740

DATE ORIGINATED: 8/19 DATE DUE: ASAP CORR TRACKING NO.: 9/27687

EXTERNAL COORDINATION: _____

	COMMENTS	DATE
DIRECTOR		
CHIEF OF STAFF		
GENERAL COUNSEL	<i>Ky concur</i>	
EXEC. ASST.		

ACTION REQUESTED: *Please return & I will mail out.*

Disette

COORDINATION	DATE	COMMENTS
Henderson, D. A. Concur _____ Nonconcur _____		
✓ Phillips, W. Concur ☒ Nonconcur _____	<i>8/29</i>	
Ratchford, J. T. Concur _____ Nonconcur _____		
Wong, E. Concur _____ Nonconcur _____		
Concur _____ Nonconcur _____		
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Concur _____ Nonconcur _____		
Concur _____ Nonconcur _____		
Concur _____ Nonconcur _____		

*Re-type
w/ Damaris
draft*

*Damaris:
perhaps Gene
Wong should
look at this too?
K*

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
03d. Letter	To: Mary Good From: Allan Bromley Re: Response to 7/22/91 letter (2 pp.)	8/16/91	(b)(1)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
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File Location: Industrial: General [2 of 7] [1991]

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Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
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"CORRESPONDENCE TRACKING"

TYPE: INFORMATION DOCUMENT NUMBER: 9122578
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: SHIMAMOTO, Yoshio

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 07/12/91

SUBJECT: CONCLUSIONS AND COMMENTS ON THE COMPARISON BETWEEN
THE ORIGINAL AND ENGLISH VERSIONS OF MITI'S "REPORT
OF THE RESEARCH COMMITTEE ON NEW INFORMATION
PROCESSING TECHNOLOGY".

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
INTERNATIONAL/POLICY
INDUSTRIAL

WHITE HOUSE TRACKING #: CONTACT PERSON:
PHONE: EXT:
REMARKS:

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OSTP RECEIVED: 07/22/91
DEPT RECEIVED:

FILE: P-INTERNAT'L-JAPAN*P-INDUSTRIA

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
04. Letter	To: Allan Bromley Re: Comparison between Japanese and English versions of MITI report (5 pp.)	7/12/91	(b)(1)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
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A Crisp Look at the Fuzzy Buzzword

Tempting as it is, we will try to resist "fuzzy" puns in this look at Japan's latest techno-fad. As shops across the nation sprout fuzzy fridges, air conditioners, washing machines and vacuum cleaners, journalists and copywriters have exploited every corny quip imaginable. The verbiage threatens to obscure what promises to be a useful approach to solving all sorts of sticky technological problems.

First, for those who are still unclear on fuzzy theory and how it applies to today's technology, a quick catch-up.

"Fuzzy logic" is an offshoot of modern mathematical theory first put forward by Professor Lofti Zadeh of the University of California at Berkeley in 1965.

Departing from the ordinary true/not-true precision of ordinary mathematics, "fuzzy logic" allows descriptions of events and conditions in the vague ways that humans see them. "A little more," "too hot" and "almost round" are all pretty simple concepts to us, but they're incomprehensible in the black/white, yes/no world of digital control computers. With fuzzy systems, however, computers can be trained to "see in shades of gray," paradoxically making them more precise, flexible and efficient.

Members of the Fuzzy Set

The theory isn't as vague as it sounds. The basic concept is the "fuzzy set," as opposed to the conventional "crisp" mathematical set. A crisp set is sharply defined; an object is either a member of the set or not. In a fuzzy set, the transition from membership to nonmembership is gradual, and objects are assigned varying degrees of membership. Using this approach, it becomes easier to describe vague sets like "blond men" and "compact cars."

By studying human reactions and using them to assign values to objects and situations as a series of "fuzzy rules," human expertise and flexibility can be transferred to machines. Unexpected situations that cause normal systems to halt in confusion can be handled more flexibly by fuzzy systems, which also makes programming simpler and cheaper. Some systems are already outdoing their human teachers.

Over the past decade, Japanese manufacturers have begun to incorporate "fuzziness" into a succession of electronic products. The fuzzy set of experiences that guide the

gentle hands of Japan's veteran subway motormen was incorporated into an automatic braking system for the Sendai urban rail system. New washers make fuzzy decisions as to how much scrubbing clothes really need. Vacuums decide how hard to suck, and so on.

Useful gadgets like these have sparked consumer interest, but researchers are quickly moving on to bigger game.

Fuzzy the Banker

The MITI-affiliated Laboratory for International Fuzzy Engineering Research (LIFE), set up in 1989, is working on a fuzzy-logic system to assist foreign-exchange traders. The system will incorporate the expertise of veteran dealers, and respond to various financial data and news inputs with suggestions for buying or selling.

Conventional computer decision-making systems for exchange dealing are based on statistical models, and can't cope with imprecise inputs like the deliberately fuzzy statements issued by central bankers. But in the real world, it is intuitive interpretations of this kind of news that move markets. Within six years LIFE hopes to perfect a system that can combine hard and fuzzy data as well or better than humans.

Fujitsu, a major computer maker, is using a computer-aided instruction (CAI) system that employs fuzzy logic to train software engineers. Where standard CAI systems teach lessons in a fixed order, Fujitsu's can furnish instruction in the order that best suits the student.

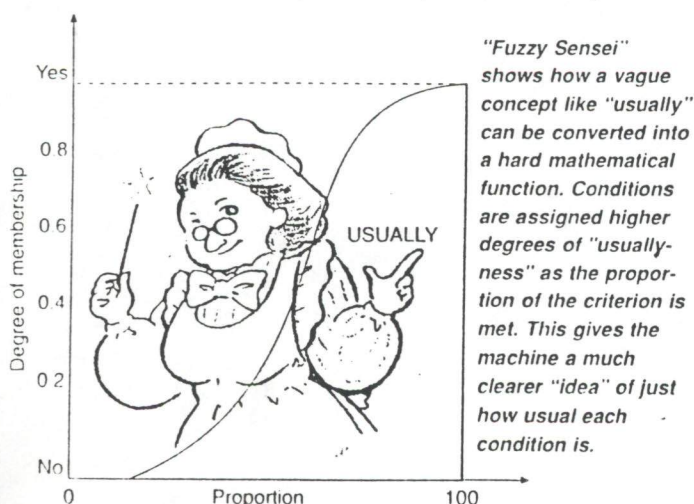
Fuzzy logic helps assess quiz results. Standard CAI systems can only decide whether the student passed or failed. Fuzzy logic allows the computer to make judgments like "she should have done better" or "he made some lucky guesses" in much the same way a human teacher might. This way, the computer can determine which concepts the student needs to study further. In some cases, the computer may decide the student knows the material despite a mediocre score; in others, the computer may believe a student was merely lucky (or cheated) and prescribe further study.

Fuzzy the Weatherman

Because many of the clues that could predict weather or earthquakes don't slot neatly into crisp sets, Japan's Science and Technology Agency has launched a five-year, ¥1-billion research project to see how fuzzy logic could help.

Meanwhile, at Kumamoto University researcher Takeshi Yamakawa has developed a computer-chip set designed to process fuzzy data faster. Yamakawa's design consists of two elements, a "rule" chip and a "defuzzifier" chip. The rule chip can handle a million calculations per second to infer correct answers from built-in fuzzy-set rules. The defuzzifier chip converts those answers into analog numbers. NASA has asked Yamakawa for permission to use his chip technology to help control docking maneuvers in the space shuttle.

But for Japanese consumers, the most famous member of Japan's fuzzy set is "Fuzzy Sensei" (teacher), a cartoon granny figure who touts Sanyo's fuzzy appliances.



SCIENCE AND TECHNOLOGY

The generation game

TOKYO

AFTER ten years and ¥60 billion (\$440m) of taxpayers' money, Japan's fifth-generation computer project—aimed at developing computers able to “infer” complete answers from half-baked questions—will soon be wound up. The collaborative project, the first in recent years to be financed entirely by the Japanese government, was conceived to help local computer firms “leapfrog IBM”. But compared with the government's previous catch-up programmes for microchips and supercomputers, its attempt to nurture an infant “inference industry” has been a flop.

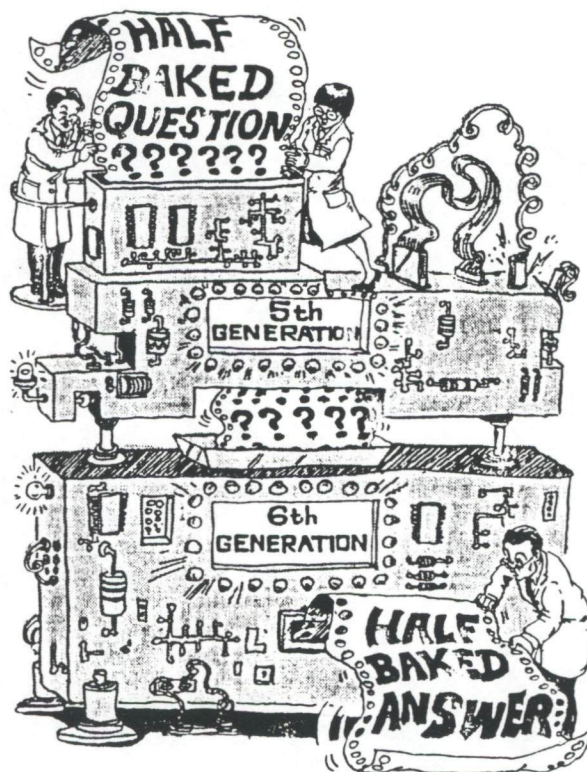
Time and money has not been entirely wasted. Corporate Japan has kept a foot in the door of “massively parallel” processing, allowing it to look on with understanding as dozens of young American firms with novel computing inventions have scampered off through the doorway and down various passages. More important, the 100 or so computer scientists assembled over the past decade at the Institute for New Generation Computer Technology (ICOT) have acquired skills needed to design the latest artificial-intelligence (AI) hardware and the software to make it work. They will go back to their government and corporate laboratories and spread the AI gospel.

Still, measured against its proclaimed aims, the programme failed. So what should come next? More of the same, according to the Ministry of International Trade and Industry (MITI). This time, though, MITI wants to include the one computer group whose absence last time did more than anything to damage its fifth-generation project. Top of the list of companies that it wants to sign up for its new sixth-generation project is IBM. Two other foreign computer makers, AT&T and Siemens, will also be invited to join, along with nine Japanese firms.

Back in 1982 the men from MITI imagined that the proposed “inference engine” would hand Japanese computer firms a winner. What they never bargained for was the reluctance of Fujitsu, Hitachi, NEC and other Japanese computer companies to abandon

their slavish following of IBM and go out on a limb with a computer concept all of their own. Without the confidence of knowing that the world's leading computer manufacturer was also making a big commitment to inference technology, the Japanese companies stayed with the tried and true. “Industry tends to stick to past experiences”, moans ICOT's director, Kazuhiro Fuchi, and “they still want to follow IBM.”

It was ambition that made the fifth-gen-



eration project try to leapfrog IBM rather than bring it in. Ambition hurt it in other ways, too. The project tried to develop an all-purpose AI machine—a computer that could, in effect, mimic the processes of human thought, which provide an uncanny ability to make guesses and muddle through ignorance. A prototype was eventually built using 64 microprocessors wired up as a parallel array. The machine could design a complicated microchip, analyse an English sentence, provide legal advice based on previous cases, and play a handy game of

“Go”. Those are all specialised, if noble, tasks; the computer organised to perform them is a far cry from the all-purpose AI machine that ICOT originally dreamed of. By the time the fifth-generation project ends next March, ICOT hopes to have something bigger, if not a great deal better: an array processor with 1,000 elements comparable to some of the “massively parallel” speed demons in the United States.

Officially called the New Information Processing Technology (NIPT), the sixth-generation project will take over where ICOT's work leaves off. Current thinking is that a new institute will be established for NIPT under the direction of Shun-ichi Amaril, a leading computer scientist at Tokyo University. Setting the priorities will be a research committee that includes R&D bosses from NTT, Fujitsu, Hitachi, NEC, Mitsubishi Electric, Toshiba, Sharp and Oki as well as ICOT.

The lesson learnt from the past ten years is that ICOT bit off far more than it could chew. By contrast, NIPT will have more modest goals. The ultimate aim is still to “process information intuitively without the need for programs.” But the task is to be broken down into more definable AI questions. Like how to make a computer work with ambiguous information? Or how to get it to adapt to change and generalise from its own experience? Or how to make it tackle monstrously large problems by discarding unnecessary data?

The kind of test question that Japanese officials cite as an example of sixth-generation computing is how to choose ten out of 100 stockmarket shares for maximum return. Sounds trivial? A conventional mainframe computer capable of 100 MIPS (millions of instructions per second) would take 30,000 years to come up with an answer. A good fund manager working with pencil, paper, a pocket calculator and well trained intuition might take a week or two. If NIPT ever manages to do its job, the task would be narrowed down to minutes.

The key will be endowing a computer with the ability to learn. That means looking at the way the brain works. At one end of the scale, the NIPT team intends exploring stacks of silicon wafers containing up to a billion interconnected neuron-like elements. At the other extreme, research is to tackle the basics of pattern recognition. If it all sounds familiar, it is. Wherever scientists pursue the holy grail of artificial intelligence,

the same topics are on their agenda. The one difference that NIFT could bring is an extraordinary proficiency in optical microchips—a technology that half a dozen big Japanese laboratories have been honing to perfection in a bid to give machines a child-like ability to read. Japanese researchers have also had more practical experience than their colleagues abroad in exploiting “fuzzy” logic with its capacity for human-like judgments (and for spurring technology-minded Japanese consumers on to excited buying sprees).

As a sprat to catch the American mackerel, MITI is now offering to share the patents resulting from the joint research with foreign participants. Officials say they are even prepared to revise Japan's patent law so that foreign firms can benefit more from participating in the NIFT project. This month, MITI is to establish a committee of experts to determine the research priorities and the contributions expected from participants in the sixth-generation project. The aim is to launch the project in April 1992. The amount of government money has yet to be determined.

Domesticating mushrooms

Muck and magic

A MUSHROOM can be a valuable thing. The autumnal woods of Italy, France and many other places are full of wandering figures in search of ceps (or porcini), chanterelles, blewits, horns of plenty, shaggy ink-

caps, puffballs, oyster mushrooms, honey fungus, hedgehog fungus and the like. In Poland pickers make a living supplying wild fungi to markets. In Scotland a walk in the woods can turn a profit if you find chanterelles to sell to the village shop. In Italy pasta is stuffed with porcini and exported.

After a decade that saw salmon domesticated, kiwi fruits tamed, venison farmed and quails' eggs made cheap, it is not surprising that exotic fungi are next. The ordinary domesticated mushroom is being joined by an increasing variety of its wild cousins. Dried shiitake mushrooms are now sold in the United States, and fresh oyster mushrooms in Britain. About five more species are grown commercially, mostly in Asia. But domesticating wild mushrooms is not proving easy. Most of those who have tried are pessimistic. They are up against some intransigent biology.

The problem is the unique way that fungi grow. The bit you see and eat is merely the fruiting body. Most of the fungus is a tangle of tentacles called the mycelium. This is not arranged into cells with nuclei, as most other creatures are. Instead the tentacles spread into their food—be it dead wood, mucky soil or stale bread—and move their nuclei, and the rest of their contents, to the places where growth is going on.

Many fungi live in the soil, as partners to plants. There is a bargain between the two. In exchange for sugar from the plant, the fungus passes on minerals and nutrients that it has extracted from the soil. This “mycorrhizal” habit hinders would-be domesticators, for the fungus cannot live without the plant. Truffles, for example, have signed up with the roots of oak trees. After many attempts at cultivating truffles, the French have fallen back on planting oaks in suitable places and inoculating their roots with the crop—a kind of ranching. A retired immunologist in California has done a little better. Moshe Shifrine is now producing 60lb (27 kilograms) of miniature truffles every week, grown in a laboratory medium; the California Truffle company turns them into oil and paste.

Getting the fungus to grow is only half the battle; you must also make it fruit. Although ceps are mycorrhizal, their mycelium can be grown on compost. But it will not produce the edible fruiting bodies. Common mushrooms are induced to fruit by being “cased” with moist peat and chalk while the humidity and carbon-dioxide concentration are increased. Oyster mushrooms fruit when the temperature is suddenly dropped and the light turned up.

A company in Michigan

called Company M has recently patented a fruiting method applicable to morels; Domino's Pizza has licensed the patent, and a pilot plant produces 300lb (136kg) a week. But finding the right recipe to induce fruiting is more a matter of trial and error than well-reasoned science; the errors are not particularly informative, which makes progress hard. David Wood, of Britain's Horticulture Research International (the former Glasshouse Crops Research Institute), says only long-term studies could find the fruiting formula for other wild mushrooms. It is hard to obtain the money for such work—even though Britain, with its imperial legacy of exotic agronomy, is rich in mycological expertise.

An alternative to domesticating wild mushrooms would be to improve domesticated mushrooms. But selective breeding is almost impossible. Ordinary mushrooms are not much given to sex, so different strains cannot be crossed. Instead, Dr Wood and his colleagues are trying to find a way of injecting genes directly into mushrooms, but that is made difficult by their habit of keeping several nuclei in every cell. The wild mushroom remains curiously unwilling to be tamed.

Muscular dystrophy

A finger in the dyke

BERKELEY, CALIFORNIA

IT IS tempting, but wrong, to think that a disease is vanquished once its genetic origins have been unearthed. In 1986 the defect that leads to Duchenne's muscular dystrophy, the most common inherited muscle disorder, was pinned to a bit of DNA that makes a protein called dystrophin. Before this knowledge can be turned into a cure, scientists need to understand how dystrophin causes the disease. Although its exact role remains shrouded, research is discovering how muscles waste away without it. This research points the way to potential new drugs.

The disease afflicts about one in every 3,400 boys. It causes weakness in the limbs as muscles are gradually supplanted by useless connective tissue, leading to disability and then death—usually before the sufferer passes his mid-20s. In healthy limbs, dystrophin is hooked up to the inside of the membrane which surrounds each muscle cell. Somehow it keeps the cell working. Experiments in which cells affected by Duchenne's muscular dystrophy were fused with nascent healthy muscle cells (known as myoblasts) have succeeded in restoring dystrophin, and some vitality, to the sick cells. But injecting lots of myoblasts into a



A small family business

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION DOCUMENT NUMBER: 9122577
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS

FROM: SHIMAMOTO, Yoshio

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 07/18/91

SUBJECT: A SUMMARY OF NEWSPAPER ARTICLES THAT CAN BE
CHARACTERIZED AS NIPT-RELATED AND FUZZY RELATED.

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: STAFF DUE DATE
DATE COMPLETED: DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
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01 JUL 22 P 2 : 22 July 18, 1991

OFFICE OF THE
DIRECTOR

Dr. D. Allan Bromley
Science Advisor to the President
The White House
Washington, DC 20506

Dear Allan:

The purpose of this letter is to provide you with a summary of newspaper articles that can be characterized as NIPT-related (Attachment A) and Fuzzy-related (Attachment B), that may be of interest to you. My primary source for articles up to August 15, 1990 is "Computer Digest" ("Kompyuta Daijesuto"), a monthly publication that lists by headlines approximately 3,000 articles of interest to the computer and telecommunications industries from ten dailies that appeared over a period of "a month" (the 15th of a month to the 14th of the next). Articles subsequent to August 14, 1990 were obtained from an acquaintance in New York City who unfortunately was recalled to Japan recently.

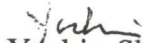
Many of the articles listed are based on company and institutional press releases. These articles are not included in the summary, unless they were considered important. Unfortunately, the full text of many articles that could have been of interest were not reprinted. These articles are denoted by (NA). Each issue of the "Digest" begins with a section called "Focus of the Month". Articles so designated are denoted by (F).

Remarks (5) and (6) of my letter to you of July 12, 1991 are based primarily, but not exclusively, on Attachments A and B. It can be said that never in the annals of MITI-initiated R&D programs has there been one that required a gestation period as long as that of the NIPT-plan, which is still in progress. For each year of its work, the Study Committee had a budget of 20 million yen. MITI's budget request for FY91 had a line for 100 million yen for a new Committee whose purpose is to "investigate how implementation of the system of 'NIPT' as an R&D program should proceed with an organizational structure that embraces international cooperative research". For starters, I hope that this Committee will reexamine and do a better job of assessing the status of the relevant fields.

With best wishes,

Sincerely,

YS:mck
Attachments


Yoshio Shimamoto

ATTACHMENT A: NIPT-RELATED ARTICLES

- (1) January 1, 1988 Nikkei Sangyo

"Surging Boom in Neurocomputing"

Based on the meeting of the International Neural Network Society held in San Diego in June, 1987, this is probably the first big story on the subject in Japan. The article discusses R&D activities in US and Europe. (The only serious activity in Japan: the bio-chip project under the "Basic Technologies for Future Industries Program".)

- (2) January 4, 1988 Nihon Keizai (F)

"Future computers that require no programming"/"Fujitsu working to put these to practical use"/"Control systems that make their own decision" (free translation)

This article states that based on the results of simulation studies, "Fujitsu is working to develop artificial brains for the controls of industrial robots by the second half of the year, and expects to have practical neuro-chips in 2-3 years". (N.B.: For the purpose of demonstrating the feasibility and utility of "learning", an essential feature of neurocomputing, Fujitsu had fabricated by May a model involving a fugitive robot, a Sherlock Holmes robot, and two Bobby robots; May 10, 1988 Nihon Keizai).

- (3) January 14, 1988 Nikkei Sangyo (NA)

"Development of Neurocomputer starts at the Institute of Physical and Chemical Research (of STA) as a part of the International Frontier Research Program"

- (4) January 26, 1988 Nihon Keizai (F)

"US leads in the development of neurocomputers"

The article was triggered by a newly created EC neurocomputer project. It mentions the government support of neurocomputers in the US (NSF and DOD) and Japan (MITI, MOE and STA). Three important current research areas are identified as (a) simulation of learning in neural networks, (b) research in neural networks with large scale parallel processors, and (c) hardware implementation of neural network models. Some organizations active in these areas are identified as follows: Johns Hopkins University, Helsinki Institute of Technology, Fujitsu, and the University of Osaka for (a), Laboratories in the US where inexpensive parallel processors are already commercialized for (b), and Cal Tech for (c).

- (5) May 23, 1988 Nikkan Kogyo

"R&D to put neurocomputer to practical use expected to be conducted as a 9-year Large Scale Project"

The article states that the project to begin next year will consist of (a) development of large scale emulators, (b) theoretical research in algorithms, (c) development of devices, (d) development of a pilot model, and (e) R&D of applications technology. (NB: It is interesting to note that expressions like "flexible information processing" and "massively parallel processing systems" that occur in the final report on NIPT are already used in this article.)

- (6) July 6, 1988 Nihon Keizai

The story covers the same subject matter as (5) above, except that it is now stated that (a) the LSP will last for 8 years with an estimated cost of 30 billion yen, and (b) in spite of the fact that the LSP will be initiated a year before the termination date of the so-called "Supercomputer Project", it will be regarded as a successor project of the latter, and will be conducted by six companies. (NB: Although not explicitly mentioned, the six are the same companies that participated in the Supercomputer Project.)

- (7) October 1988 "Computer Digest"

Each issue is called a "Special Issue on X", where X denotes a topic selected for the month. For the October 1988 issue, the topic selected was "Forefront of Neurocomputer Development". This section of the issue contains ten articles on activities, both domestic and foreign, that appeared during the month, plus 15 articles that were previously listed but not reprinted.

- (8) August 16, 1988 Sankei

MITI announced plans to create a Research Committee next year to study neural computing, bio-computing and optical computing with a view of creating a consolidated R&D project in these areas in 2-3 years.

- (9) February 6, 1989 Nihon Keizai

MITI has decided to initiate in 1992 a project to develop a computer that is capable of flexible information processing that is similar to the human brain. In order to ease technology-friction, participation of foreign industries will be sought. A proposal to create an organization with the structure of ICOT--established for the 5th Generation computer project--is most prominent. In addition, the concept adopted for the Human Frontier Science Program also exists.

- (10) September 2, 1989 Nikkan Kogyo (NA)

"MITI creates Research Committee on NIPT" (The original committee name is much longer than the final one adopted.)

- (11) September 8, 1989 Nihon Keizai

"Committee on 'Right Brain' Computer (i.e. NIPT) created by MITI. R&D to begin as early as 1991"

(N.B.: It is interesting to note that Shinya Shinagawa, Professor of Physiology at Tokyo Medical College, who claims that he was the first to promote "Right Brain" computer, did not participate in any of the activities of the Research Committee.)

- (12) January 16, 1990 Nikkei Sangyo (F)

"Neurocomputers"/"(New) Impetus for development, advancing toward stage of putting to practice use"/"Succession of International Conferences"

The article points out that (1) due to the rapid advances being made in neurocomputers, six international conferences are being planned for 1990 and 1991, (2) each of the major electronics and computer companies is adopting a different approach to neurocomputing, (3) the banks, securities houses, hospitals, etc. are experimenting with new applications areas, and (4) whereas there were only about 500 Japanese researchers in this field two years ago, the number now exceeds 3,000 (comparable to the US).

- (13) February 19, 1990 Nihon Keizai

This article is on the interim report of the Research Committee of NIPT which is erroneously characterized as a firm plan to develop a "Right Brain" computer. In the summary part of the article, it is stated that MITI plans to call for world-wide participation for the proposed project, and that basic research may start as early as 1991. NIPT is regarded as the successor project to the "5th Generation Computer Project" which ends in 1992.

- (14) March 23, 1990 Nihon Kogyo

The "Superconducting Sensor Laboratory" was established with eight participating companies and investment of 5.7 billion yen (70% of which is from Japan Key-Tech Center). The laboratory, with a life of six years, will develop SQUID sensors that will be needed for basic research on the brain whose results, in turn, are required for the development of neurocomputers.

- (15) April 2, 1990 Nihon Keizai

"Development of 'Massively Parallel Processing Type' active in Japan and US"/"Superior to supercomputer"

This rather vague article states that MITI intends to "introduce" in 1992 public sector/private sector cooperation in the development of massively parallel processing systems and that the possibility of kindling a new U.S./Japan technology friction has arisen. The article, however, does mention the existence of the interim report of the Research Committee on NIPT. Since the "fear of friction" issue is raised at the outset and also at the end of the article, it would appear that a project distinct from NIPT is being discussed.

- (16) January 10, 1991 Asahi

In this article, which is remarkable for its clarity, it is stated that MITI will organize a study group (the same expression for study group is used in the article of June 18, 1991, cited in my letter to you of July 12, 1991) to investigate whether or not the development of the 6th Generation Computer is indeed feasible. The 6th Generation Computer is simply defined as the computer with human-like decision-making capabilities. It is further stated that "the study group will investigate the various technologies that are essential for the realization of the 6th Generation Computer and, including the promotion of international cooperation, the manner in which the R&D should be structured". The article then summarizes the failings of the 5th Generation Computer, and concludes by mentioning four technologies that are essential for the successful development of the 6th Generation.

- (17) January 18, 1991 Nikkei Sangyo
February 11, 1991 Nihon Keizai

"Matsushita succeeds in developing an experimental neurocomputer that is free of electronic control" (36 optical neuron devices capable of recognizing "O", "P", and "T")

(18) March 10, 1991 Nihon Keizai

"A 10-year plan to cooperatively develop the 6th Generation Computer"

With the usual what is becoming standard description of 6th Generation Computer, this article states that MITI will initiate the project next spring. Two rather remarkable statements are made.

"MITI has been seeking the participation in the project of the industrial world and academia in US and Europe through the US government and EC."

"In addition to ATT and Siemens (implied earlier in the article as committed), IBM and other prominent companies from abroad plan to participate, joining nine Japanese companies such as Fujitsu and Hitachi."

(19) March 29, 1991 Nikkei Sangyo

This article reports on the "Report of the Research Committee on NIPT" and on an International Symposium on NIPT held on March 13-14. It states that "for a government project not to have a definite objective is unprecedented".

(20) April 4, 1991 Nikkei Sangyo

"Interested in Research on 'Massively Parallel Type' System"

Story based on interview with Dr. D. Waltz (?) of Thinking Machines. He is extremely interested in participating in the "6th Generation Computer" plan, but is concerned about questions on how intellectual properties will be handled.

(21) May 2, 1991 Nihon Keizai

"MITI to study commercialization (yes, you read it correctly!) of 6th Generation Computer"

"In anticipation (original -- 'facing') of the development of the 6th Generation Computer, MITI will begin, with July as a target date, a feasibility study on the commercialization of the 6th Generation Computer. Initially the Ministry and domestic companies will cooperate and examine (investigate) the functions that can reasonably be expected to emerge (original -- 'achievable functions'), and forecast for demands (for these functions?) in 10 years. Furthermore, after the participation of American and European industries have been secured, details on the manner in which to allocate research responsibilities will be worked out (literally, 'will be filled'). Thereafter, it is expected that the Japan/US/Europe cooperative development will begin in the spring of next year."
(full text)

(NB: I have also seen listed in a publication that has a very short "news" section (by headlines only), an article in the February 7, 1991 edition of Denpa that makes reference to "feasibility study on commercialization".)

(22) May 22, 1991 Asahi and Nikkan Kogyo

"US government protests to Japanese government for going over its head"

(Identical news on the "Washington Post article" of May 21 via Jiji News Service.)

(23) and (24) These articles are mentioned in my letter to you of July 12, 1991.

ATTACHMENT B: FUZZY-RELATED ARTICLES

- (1) December 15, 1986 Nikkei Sangyo

Perhaps the earliest mention of fuzzy logic in the Japanese press. The article reports that Hitachi has implemented some ideas suggested by fuzzy logic in the control of the newly created subway system in Sendai City.

- (2) June 19, 1987 Nikkei Sangyo (NA)

"Japan ahead of US in fuzzy"

- (3) April 30, 1988 Nikkan Kogyo (NA)

"MITI to create (as early as next month) a study group on the application of fuzzy logic in the development of advanced control technology."

- (4) June 9, 1988 Nihon Keizai

"Fuzzy Computer to be developed cooperatively by 30 firms representing different industries (in March next year)."

- (5) July 22, 1988 Denpa (NA)

"An advisory Fuzzy Study Group is established at the Science and Technology Agency."

- (6) August 30, 1988 Nikkei Sangyo (F)

"Three facts became evident at an international workshop on applications of fuzzy systems: the emergence of full-scale dedicated fuzzy equipment and devices; the trend to combine fuzzy and neural capabilities; and the increase in the application areas of these systems."

- (7) August 17, 1988 Nikkei Sangyo

"Details on the creation by MITI of the Laboratory for International Fuzzy Engineering Research (LIFE) next year with investments from both the government and private sector became clear." (44 participating companies with a five year budget of 5.47 billion yen of which 3.83 billion yen (70%) is expected from the government's Japan Key-Tech Center.)

- (8) January 10, 1989 Nihon Keizai

"Decision was made by MITI to create LIFE. 42 participating companies will invest 4.2 billion yen in the 6-year project. Originally an investment of 3.8 billion yen was expected from the Japan Key-Technology Center. However, due to the Center's budgetary situation this additional investment will not be forthcoming."

"MITI is expected to issue guidance on the results (intellectual property rights) which will stipulate that copyrights of the software developed will belong to the Laboratory, but algorithms developed are to be released to domestic and foreign users at no cost."

- (9) June 7, 1989 Nihon Kogyo

A report on future directions of fuzzy systems by the Fuzzy Study Group was submitted to the Science and Technology Agency. The report identifies six areas that should be promoted at this time. As a means of promoting these six areas, it is proposed that a nation-wide (research?) burden be clarified and a long-range unified research program be pursued. "It is expected that the report will act as the basic document of fuzzy research in Japan, and (its findings) will be reflected in (the Agency's?) long-term budget requests."

- (10) July 18, 1989 Nihon Keizai

A new study group headed by Prof. Michio Sugano of Tokyo Institute of Technology will be created as early as September to plan for the implementation of the Fuzzy Study Group proposal submitted to STA in June. (A 5-year plan with a budget of 1 billion yen and 20 organizations.)

- (11) September 7, 1989 Nihon Keizai (F)

"Introduction (Use) of Fuzzy Technology Moves Forward"

This article gives examples of how fuzzy technology is being used by the vendors in their products and how they are being used by the consumers.

- (12) January 18, 1990 Denpa (NA)

"STA and MITI, having resolved their differences (literally, 'having had their bout') on basic research on an engineering application of fuzzy theory, full-scale (government funded fuzzy?) research projects (can proceed?)."

- (13) March 9, 1991 Nikkan Kogyo

This article states that in order to promote the dissemination and awareness of fuzzy, MITI has announced that the name of the "AI Promotion Center" at the Japan Information Processing Development Center (JIPDEC) will be changed to "AI Fuzzy Promotion Center" in April. Full-scale fuzzy-related activities (sponsoring lectures and symposiums, collection and distribution of fuzzy-related literature, etc.) at the Center will commence next year. The main event planned for next year will be a three-day International Fuzzy Engineering Symposium. (NB: JIPDEC was responsible for the 3-year study which preceded the creation of the 5th Generation Computer project. More recently it hosted the International Symposium on NIPT '91.)

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

August 9, 1991

TO: D. ALLAN BROMLEY

FROM: EUGENE WONG *EW*

SUBJECT: Yoshio Shimamoto's Summary of Newspaper Articles on NIPT and Fuzzy

This is an interesting document. Yoshio Shimamoto has provided a comparison between the English and Japanese versions of MITI's report on New Information Processing Technologies project (NIPT) and noted some subtle, but probably deliberate, differences. He also reports a less than enthusiastic press reaction to the MITI initiative, specifically a newspaper editorial denouncing MITI for practicing industrial policy!

Shimamoto should be encouraged to continue his interest in the 6th Generation computing project.

Attachment