

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: Correspondence Files

OA/ID Number: 62004
Folder ID Number: 62004-010

Folder Title:
D. Allan Bromley Correspondence - Presidential - A-Z [1 of 5] [1990]

Stack:

Row:

Section:

Shelf:

Position:

0

0

0

0

Withdrawal/Redaction Sheet (George Bush Library)

Doc. No. / Type	Subject/Title	Date	Restriction	Classification
01a. Letter	To: Allan Bromley From: William Stryker Re: Request for Guest Speaker (2 pp.)	10/24/89	(b)(1)	
01b. Schedule	Tentative schedule for seminar on international technology competititon (1 pp.)	n.d.	(b)(1)	
02. Letter	To: Maxim Yu Khlopov From: Allan Bromley Re: USSR-USA cooperation on cosmoparticle physics (2 pp.)	6/13/90	(b)(1)	
03. Letter	To: Ishimatsu Kitagawa From: Allan Bromley Re: International environmental research (1 pp.)	6/13/90	(b)(1)	
04. Letter	To: Bernard Oliver From: Allan Bromley Re: SETI (2 pp.)	7/12/90	(b)(1)	
05. Letter	To: G. Laustriat From: Allan Bromley Re: Walter Greiner (1 pp.)	6/13/90	(b)(6)	
06. Letter	To: Irv Pollack From: Allan Bromley Re: Nuclear power (2 pp.)	6/13/90	(b)(1)	
07. Letter	To: George Wood From: Allan Bromley Re: Gorbachov visit (2 pp.)	6/22/90	(b)(1)	

Page 1 of 2

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: Correspondence Files
WHORM Cat.:
File Location: D. Allan Bromley Correspondence - Presidential - A-Z [1 of 5] [1990]

Pinksheet Number: MB272
OA/ID Number: 62004-010
Date Closed: 2/10/2010
FOIA/Sys Case #: 2005-0336-F
Re-review Case #:
P-2/P-5 Review Case #:

Withdrawal/Redaction Sheet

(George Bush Library)

Doc. No. / Type	Subject/Title	Date	Restriction	Classification
08a. Letter	To: Allan Bromley From: Werner Weidenfeld Re: German-American cooperation (1 pp.)	n.d.	(b)(1)	
08b. Letter	To: Werner Weidenfeld From: Allan Bromley Re: German-American cooperation (1 pp.)	1/29/90	(b)(1)	

Page 2 of 2

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: Correspondence Files
WHORM Cat.:
File Location: D. Allan Bromley Correspondence - Presidential - A-Z [1 of 5] [1990]

Pinksheet Number: MB272
OA/ID Number: 62004-010
Date Closed: 2/10/2010
FOIA/Sys Case #: 2005-0336-F
Re-review Case #:
P-2/P-5 Review Case #:

THE WHITE HOUSE
WASHINGTON

January 29, 1990

Dear Bill:

Many thanks for your gracious note of January 15. I, too, was very sorry that our schedules did not make it possible for us to meet during my recent re-visit to Duke. Tom Ratchford and I had a fascinating time at the North Carolina School of Science and Mathematics, and the visit provided a good opportunity to get to know Governor Martin, as well as Congressmen Valentine and Price.

I look forward to seeing you on one of your next visits to Washington and have passed on your best regards to Jim Wyngaarden.

With all best wishes,

Sincerely yours,



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

W.G. Anlyan, M.D.
Chancellor
Duke University
213 Allen Building
Durham, North Carolina 27706

① DAR-F41
② Dama - for system

Duke University
Durham
North Carolina 27706

Office of the Chancellor
213 Allen Building

(919) 684-3438

January 15, 1990

in dictation

Dr. D. Allan Bromley
Assistant to the President
For Science and Technology
Room 360
Old Executive Office Building
Washington, D.C. 20506

Dear Allan:

I am delighted that you will be visiting Duke on Thursday, January 25. It sounds like a terrific program. I regret very much that our Alumni and Development Offices have me scheduled in the Los Angeles area on that day.

Hope all is going well with you. Hope to see you in Washington soon. My best regards to you and Jim Wyngaarden.

Sincerely,

Bill

W. G. Anlyan, M.D.

WGA:slh

cc: Dr. H. Keith H. Brodie

DIRECTOR
OFFICE OF THE

30 JAN 25 6 41:48

RECEIVED

North Carolina State
University
Raleigh, North Carolina 27695

(212) 850-4444

Office of the Chancellor
of the State of North Carolina

CRANESBURY CREST

OFFICE OF THE
DIRECTOR

90 JAN 22 P 4: 49

RECEIVED

THE WHITE HOUSE

WASHINGTON

September 17, 1990

MEMORANDUM FOR THE PRESIDENT

SUBJECT: D. ALLAN BROMLEY *Alan*

SUBJECT: THE ROLE OF THE AMAZON BASIN

When you last met with your Council of Advisors on Science and Technology you asked what importance should be attached to the preservation of the Amazonian rain forest.

The brief answer is that these forests are extremely important for several reasons including the following:

1. They constitute the largest untapped gene pool on the planet--an irreplaceable human heritage.
2. They act as massive "sinks" (i.e., natural uptake) for greenhouse gases such as carbon dioxide and low altitude ozone. (It is stratospheric ozone, in contrast, that forms in the upper atmosphere and protects us against solar ultra violet radiation).
3. They play a vital role in conditioning the climate far beyond their borders.
4. They are currently home to a number of primitive indigenous people who could find it extremely difficult to readjust to life outside such forests.

The major driving force leading to destruction of these forests is the desire to obtain additional agricultural land. This is misguided because the soil underlying such tropical rain forests are typically thin and nutrient poor. Initial burning of the forests provides an ash fertilization that allows agricultural use for only a few years before the soil is depleted and left as a wasteland subject to erosion by water and wind. It takes typically a century to fully reconstitute a rain forest after its destruction--and of course there is no way to regenerate the lost gene pool, which could be a vital resource for genetic engineering of new crop plants, pharmaceutical and the like.

One of the best scientific studies of these phenomena has been underway for many years under a joint Brazil-US program. Much of the leadership for that program has been provided by Dr. Thomas Lovejoy, Assistant Secretary of the Smithsonian, who is also a member of your Council of Advisors on Science and Technology.

In a major project, he has convinced the Brazilians to leave untouched native rain forest patches of varying area so that over a period years of study it will be possible to establish the minimum size of forest required to house any given species. This program has been recognized worldwide as one of vital importance and is one that you might wish to visit when you travel next to Brazil should your schedule permit. I would welcome the opportunity to provide any additional information on this topic that you might find useful. Appended hereto is a more detailed memorandum.

Attachment

The Role of the Amazon in the Earth System

Where Does the Amazon Fit into the Climate and Global Change Issue?

The Earth's climate varies substantially both on regional and global scales. The role of vegetation and wildlife (i.e., trees, underbrush, animals, and their complex interactions, referred to as an "ecosystem") in that variability is critical to resolving the uncertainties in climate and global change. There are many uncertainties concerning the magnitudes of greenhouse gas "sources and sinks" (i.e., emissions and uptakes), particularly for carbon dioxide. The magnitude of the overall uptake and release of carbon and the strengths of the individual sources of other greenhouse gases, such as methane and nitrous oxide, are quite uncertain. These uncertainties limit our ability to understand the quantitative consequences of any specific emissions control strategy. Understanding the Amazon Region will assist in resolving these uncertainties.

What Do We Know About the Amazon Basin?

The Amazon Basin is one of the largest continuous tropical forests (approximately one half of all rain forests) and grassland areas in the world. Approximately fifteen percent of the Earth's plant and animal life is in the Amazon, making it an important "sink" for carbon. It is host to roughly half the species on Earth, and roughly twenty percent of the world's freshwater flows through the Amazon River and its tributaries. The region is an important natural "sink" for ozone pollution at the Earth's surface and has an important role in natural chemical processes in the atmosphere near the surface of the Earth.

What Specific Role Does the Amazon Play in Climate and Global Change?

In its undisturbed state, the region plays a significant role in regulating regional water balance and global climate. The water balance at the Earth's surface is a key determinant of its climate, the viability of the Earth's ecosystems, and the uptake and release of carbon, nitrogen and phosphorus (components of greenhouse gases). The evaporation and condensation of water define this balance. Rainfall and the associated release of latent heat are principal forces defining global circulation patterns in the atmosphere.

Two-thirds of the Earth's rainfall occurs within the tropics and subtropics, and precipitation patterns are especially variable in these areas. The Amazonian rain forest lies fully within the tropics, and scientific consensus indicates that regional precipitation is highly dependent on the tropical rain forest itself, which may evaporate as much as 50% of the water vapor that will once again fall as local rain. Billions of people live in the tropics, and even short-term, natural climatic events (e.g., El Nino -- the periodic shifts in Southern Hemispheric winds and ocean currents that can affect weather around the world) often have disastrous effects. These climatic shifts have also been demonstrated to extend into the mid-latitudes.

Compounding this natural variability, the alteration of the Amazon environment by human activities has great potential to affect global and regional climate through the

alteration of land cover. Twenty to thirty percent of the global deforestation occurs in the Amazon. This conversion of natural land cover influences climatic condition in two significant ways:

- 1) The alteration of ground cover, such as the conversion of forests to pastures, influences heat exchange with the atmosphere, causing an increase in temperature and decrease in evaporation.
- 2) Deforestation results in the release of greenhouse gases, primarily carbon dioxide, which influence atmospheric chemistry and the ability of the atmosphere to contribute to global warming or cooling.

With respect to changes of ground cover, climate modeling experiments have shown that without the currently existing vegetation, drier and hotter conditions prevail. Such changes would not only increase the incidence of fire and hence emissions of trace gases, but may preclude the reestablishment of a tropical rain forest.

Current deforestation in the Amazon causes an annual net release of approximately 0.4 billion metric tons of carbon in the form of carbon dioxide, or approximately twenty percent of the natural global release, and nearly one-third the release from fossil fuel burning in the U.S. Considering the combined contribution of biological sources and fossil fuel combustion, deforestation in the Amazon currently results in approximately six percent of the annual global total carbon dioxide release. Burning in the Amazon is a significant global change phenomenon. A precise estimate of the rate of deforestation and the exact quantity of greenhouse gas emissions from such burning is uncertain and further research is required.

Where Does the Biodiversity Question Fit Into the Issue?

There is increasing evidence that Amazon deforestation carries with it a substantial loss of plant and animal species. Some estimates suggest that such deforestation could result in a loss of up to one half of the world's stock of genes. This loss would dramatically reduce the biological diversity of the planet and would severely limit the future of genetic stocks for biotechnology development. Each species represents a unique set of biological properties and processes which are critical to important advances in the life sciences. For example, millions of Americans depend on a hypertension drug derived from an Amazonian viper. Expanding knowledge about these biodiversity and biosphere processes in Amazonia is a complementary part to the overall need to understand climate and global change.

What Is the Position of the Scientific Community on the Issue?

The scientific community, both domestically and internationally, sees the criticality of Amazonia to climate and global change, and hence, has integrated the region into the overall research plans to understand the Earth's geo-biosphere. The uncertainties in understanding are profound. Definitive new understanding will necessarily require enhanced monitoring and modeling of the complex coupled climate-biosphere processes that occur in the Amazon, and the role they play in larger global scale processes. The monitoring will require land-based, airborne and satellite remote sensing systems.

THE WHITE HOUSE

WASHINGTON

December 20, 1990

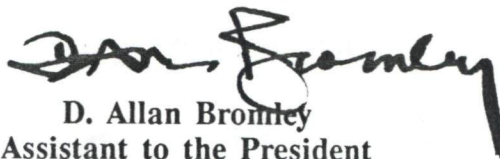
Dear Mlle. Bidwell:

Thank you for your kind letter of December 3 inviting me to join the Forum for discussions in Davos during the week of February 5, 1991. I apologize for the much belated response.

The number of requests I receive is overwhelming and growing, and I am finding it necessary to regret almost all of them. The period in question is not a good time for me to be away from Washington so, as much as I would like to join you, I must regretfully decline.

I appreciate your thinking of me and wish you a successful new season for the Forum.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "D. Allan Bromley", written in a cursive style.

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

Mlle. Gail Bidwell
Director and Member
of the Executive Board
World Economic Forum
53 Chemin Des Hauts-Crets
CH-1223 Cologny/Geneva
Switzerland

THE WHITE HOUSE

WASHINGTON

December 20, 1990

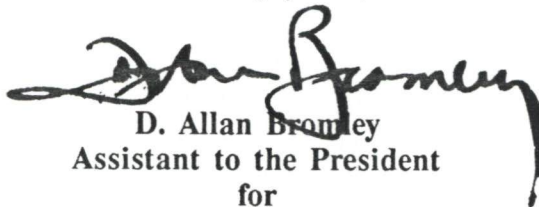
Dear Mr. Brown and Ms. Ayoub:

Thank you for your kind invitation to be the keynote speaker at the 46th annual Engineers' Fair scheduled for February 15 and 16, 1991.

However, as you can appreciate, the number of requests that I receive asking me to make presentations is overwhelming. And although I would very much like to accept a great many of these invitations, it is simply impossible for me to do so. Unfortunately, I have a previous commitment that requires my being away from Washington, so I must regretfully decline.

I appreciate your thinking of me and wish you a successful Fair.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "D. Allan Bromley", is written over the typed name.

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

Mr. Caryl B. Brown and Ms. Rana G. Ayoub
Chairman and Assistant Chair
1991 Engineers' Fair
300 Weil Hall
University of Florida
Gainesville, Florida 32611

"INVITATION FOR DR. BROMLEY"

TYPE: Invitational Speech

DOCUMENT NUMBER: 8910155

SPEECH: Yes

FROM: Defense Intelligence Agency

DATE OF EVENT: 05/19/90 *Saturday*

LOCATION OF EVENT: BOLLING AIR FORCE BASE

TIME OF EVENT: 08:30AM

SUBJECT: Request for Guest Speaker on pressing current issue
of worldwide technology competitiveness.

RSVP:

CONTACT PERSON: William N. Stryker

CONTACT NUMBER: 373-4712

INVITATION ACCEPTED? YES NO

REMARKS:

Maybe Michelle Van Cleave ??
15 *R* *go. please*
DAB

DATE OF LETTER: 10/24/89

DATE RECEIVED: 10/26/89



DEFENSE INTELLIGENCE AGENCY

WASHINGTON, D.C. 20340-



U/IRD-50

24 October 1989

TO: Dr. D. Allan Bromley
Executive Office of the President
Office of Science and Technology Policy
New Executive Office Building
Washington, D.C. 20000

SUBJECT: Request for Guest Speaker

1. The Defense Intelligence College, as a part of the Defense Intelligence Agency, is sponsoring a new weekend seminar on the pressing current issue of worldwide technology competitiveness. The Seminar On International Technology Competition will be offered 19-20 May 1990 to approximately 100 government-wide workers who requested this type of informal training. Several of the talks to be given center around the SOCRATES Project with which you are familiar and whose Deputy Director is also the Seminar Director. We would greatly appreciate your time to give a 20-30 minute talk or to provide another OSTP speaker to address our students. This talk on "Presidential Technology Policy" is scheduled for Saturday, 19 May 1990 from 0830 to 0900 hours at the Defense Intelligence Analysis Center (DIAC), auditorium at Bolling Air Force Base. You are welcome to stay for the entire day if you wish. Your talk would cover the function, duties and operations of OSTP and your own perceptions of what issues lie ahead for U.S. technology policy and planning.

2. In the past, the College has offered many professionally run seminars of this type with outstanding success. The seminars encourage interchange of ideas in an academic atmosphere where a non-attribution policy is followed. We anticipate that this seminar will provide valuable insight to those connected with technology planning in various government agencies. A seminar schedule is enclosed and as you can see, your talk is intended to be a significant part of the course introduction. For your reply, would you kindly contact me at 373-4712 or write to me at:

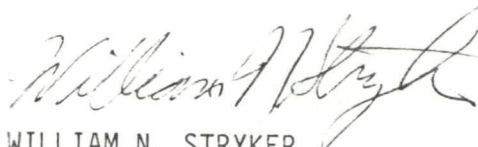
DIA/DT-5B3
Washington, DC 20340-0001.

3. The Saturday session of the seminar will be unclassified, while the Sunday session will include some classified presentations for which the attendees for that day will require a security clearance of SECRET. Attendance for the Sunday session will require either a DIA badge with appropriate level clearance or forwarding of clearances to the College with the following address:

MAIL: Defense Intelligence College
Washington, D.C. 20301-6111
ATTN: DIC-1/Security Officer

MSG: DIA WASHINGTON DC//DIC-1
SSO: SSO DIA//OS-4A//
(text should request 'pass to DIC Security Officer')

5. We would be deeply grateful for your participation in our program. Thank you for your continued interest in our curriculum and willingness to share your time and special expertise.



Enclosure a/s

WILLIAM N. STRYKER
Director, Seminar on International
Technology Competition



THE SEMINAR ON INTERNATIONAL TECHNOLOGY COMPETITION

SPONSORED BY: DEFENSE INTELLIGENCE COLLEGE, WASHINGTON, D.C.

MANAGED BY: AFIA INTELLIGENCE RESERVE DETACHMENT (IRD) 50, FORT BELVOIR, VA

COURSE/CLASS NO. SOITC(SR-550) DATES: 19-20 May 1990 PLACE: Auditorium - Defense Intelligence Analysis Center

SATURDAY:				
TIME	BLOCK	SUBJECT	SPEAKER	ORGANIZATION
0800-0830	SR550.1	Welcome and Course Introduction	Capt Daskal	IRD-50
0830-0900	SR550.2	Presidential Technology Policy	TBD (Dr. Bromley)	OSTP
0900-0930	SR550.3	U.S. Military/Industrial R&D Base Issues	Mr. Compton	OUSDA
BREAK				
0945-1015	SR550.4	Foreign Technology Availability	Mr. Welihozkiy	DOC/OFA
1015-1045	SR550.5	Militarily Critical Technologies List	Dr. Lomacky	OUSDA/IPP
1045-1115	SR550.6	Foreign Competitive Planning Threat	Maj Stryker	IRD-50
LUNCH				
1245-1315	SR550.7	U.S. Industrial Competitiveness - An Industry View	Capt Burch	IRD-50
1315-1415	SR550.8	The SOCRATES Project - Foreign Technology Capability	Maj Stryker	IRD-50
BREAK				
1430-1530	SR550.9	Technology Strategic Planning	Mr. Sekora	DIA/SPO
1530-1600	SR550.10	U.S. Government Response	Mr. Jarboe	U.S. Senate Staff
SUNDAY:				
0800-0830	SR550.11	Overview of DoD S&T Intelligence	LtCol Hukle	DIC-2C
0830-0930	SR550.12	Soviet Military Technology R&D Threat	LtCol Steinbach	DIA/DT-5A
BREAK				
0945-1045	SR550.13a	Collection Aspects of S&T Intelligence: DoD FME	Mr. Lamb	DIA/DT-FMO
1045-1115	SR550.13b	Collection Aspects of S&T Intelligence: HUMINT	Ms. McMaugh	DIA/DAH-2
LUNCH				
1245-1315	SR550.13c	Collection Aspects of S&T Intelligence: IMINT	video tape	
1315-1400	SR550.14	Technology Transfer - Threat to Western Technology	Mr. Grant	DIA/DT-5B
BREAK				
1415-1445	SR550.15	Project CASTAR - The Customs Connection	Mr. Raimondi	DIA/DT-5B4
1445-1600	SR550.16	Discussion and Summary	Capt Daskal	IRD-50

Course Director: William N. Stryker, Maj USAFR
 Deputy Course Director: Steven E. Daskal, Capt USAFR
 Staff Officers: Paul L. Bailey, Maj USAFR, and Douglas A. Burch, Capt USAFR

THE WHITE HOUSE
WASHINGTON

December 5, 1989

Dear Major Stryker:

Thank you for your kind letter of October 24 inviting me to address your students at the Defense Intelligence College on May 19, 1990.

Unfortunately, I find that the date in question is already committed and I will not be able to join you, much as I would like to do so.

I hope, however, you will keep me in mind in the future and I offer my best wishes for a successful weekend seminar.

Sincerely,

A handwritten signature in dark ink, appearing to read "D. Allan Bromley", written in a cursive style.

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

Major William N. Stryker, USAF
DIA/DT-5B3
Washington, D.C. 20340-0001

THE WHITE HOUSE

WASHINGTON

June 25, 1990

File: Ennis

Dear Pat:

I am sorry that we had so little time to talk last Tuesday when I was in New Haven but I must tell you how much I appreciate your letter of May 21 with its impressive new data on germanium 64. Obviously you already have plenty of data for an excellent thesis, and from the sound of things, you have really gained a very broad exposure to all the techniques of modern nuclear spectroscopy.

I understand from our discussions that your primary interest lies in a position at AT&T Bell Laboratories and that you are interested in eventually being more in the management channel than in the specific research activity.

As I am sure you already know from John, the laboratory has an extensive group of alumni already in place numbering now something close to 20.

I expect to be seeing Peggy Tung within the next week or two here in Washington. She will be attending a conference of some sort and she and her husband have both been on the Bell staff for the entire period since she graduated some 10 years ago. Her husband works at Holmdel and Peggy works at Murray Hill and has a rather large group reporting to her in the systems area.

As I told you when we talked, when you are something like 9 months from your best estimate of availability, let me know and I will be happy to talk to some of the people at the Bell Laboratories on your behalf. Just to get some sort of comparison and a feeling for what other opportunities might be like, however, I would every strongly urge that at the same time you make contact with some of the other major industrial laboratories. Specifically, include the T. J. Watkins Research Laboratory of IBM, Yorktown Heights, New York, and perhaps the research laboratories at Ford Motor Company in Detroit which are currently undergoing major expansion and revision. I would also suggest the possibility of the GM Research Laboratories also in Detroit and the Hewlett-Packard Laboratories in Palo Alto. I have excellent contacts through old friends at all of these laboratories and will be happy to provide the appropriate introductions for you when the time is right.

Having made the decision that you would like an industrial career I feel that it is very important for you to interview with a significant number of these companies to get an overall feeling for what kind of differing opportunities they might present. I would also suggest that although you, at the moment, do not have a specific desire to spend time at a national laboratory, that it would be very good to go to both the Argonne National Laboratory and the Oak Ridge National Laboratory where substantial spectroscopy activity is underway with superb facilities and excellent support. Even if you have no intention of actually taking up a position with either of these laboratories, the time spent in interviewing and becoming more familiar with the facilities they have to offer would be well spent.

It was good to see you, albeit briefly, and I hope that you will continue to keep me informed about your work as it progresses.

The trip that you have scheduled to Ghana this August sounds like a very interesting one and I am sure that it will give you an opportunity to see what scientific research is like in the developing world. As you say, it certainly will be a horizon broadening experience and I will look forward to hearing about it when you return.

With warmest best wishes,

Sincerely yours,



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

Mr. Patrick Ennis
A. W. Wright Nuclear Structure Laboratory
Post Office Box 6666
272 Whitney Avenue
New Haven, Connecticut 06511

January 24, 1990

Dear Harold:

Only a bout of viral pneumonia would prevent my being present to hand you this Certificate of Appreciation in person.

Both personally, and on behalf of the national science and technology communities, I want to tell you how deeply we feel indebted to you for your years of enlightened, dedicated service to both science and technology in your leadership positions within the Congressional staff.

As someone who has had the privilege of working with you during all three of your Florida, Michigan and Washington periods, I know what a deep commitment you have always had to maintaining and supporting excellence.

You have served your nation and your profession in exemplary and outstanding fashion.

With every good wish for health, happiness and satisfaction in whatever activities you next undertake,

Sincerely yours,

/s/

D. Allan Bromley
Assistant to the President
for
Science and Technology
and Director,
Office of Science and Technology Policy

Dr. Harold P. Hanson
Executive Director
Committee on Science, Space and Technology
U.S. House of Representatives
2321 Rayburn House Office Building
Washington, D.C. 20515-6301

THE WHITE HOUSE

WASHINGTON

December 21, 1990

Walter
Dear Dr. ~~Kohn~~:

Thank you for your letter of December 17 and your message. I have taken the liberty of forwarding your letter to the National Security Advisor, Brent Scowcroft, for his attention. His office is the most appropriate office here to receive your comments.

I appreciate your taking the time to write. Best wishes,

Sincerely,

Alan

D. Allan Bromley
Director

Dr. Walter Kohn
Department of Physics
University of California
Santa Barbara, CA 93106

THE WHITE HOUSE

WASHINGTON

June 14, 1990

Dear Jim:

This is a belated reply to your letter of June 1st in which you tell me about the major changes that you foresee in your life during this next few months. I am sure that you will enjoy Amherst because during the four years when my daughter was at Smith we had occasion to explore the area and it really is a beautiful one with some marvelous country inns and restaurants and intellectual life in the associated colleges in the area that makes for probably a great many more opportunities than you will wish to follow up.

I will look forward to your papers on science policy. You certainly have the appropriate background to make cogent comments.

Your question about the extent to which Federal agencies pay attention to the recommendations of their advisory committees is one that I consider important. If, as you say, there is a trend for the agencies to be less responsive to these recommendations from their advisory committee, then indeed some examination of the question will very much be in order. I am perhaps a little surprised by your conclusion because it is my impression, for example, that the National Science Board is in the process of being strengthened by the addition of more active scientists to its membership and I have been very much impressed by the quality and scope of the new Secretary's Advisory Committee that Jim Watkins has pulled together in the Department of Energy. If you would be willing to share with me on a privileged basis a few anecdotal examples of the kind of problems you have in mind it would be particularly helpful and I would of course respect any confidentiality that you might wish to impose.

With warmest best wishes and the hope that your retirement will be a long, happy and productive one,

Sincerely yours,



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

Professor James A. Krumhansl
Laboratory of Atomic and Solid State Physics
Cornell University
Clark Hall
Ithaca, New York 14853-2501

THE WHITE HOUSE

WA July 16, 1990

Dear Jim:

Many thanks for sending me a copy of your June 14 letter to Senator Mikulski with its various enclosures. The points you make are well taken and, as I have indicated before, I will be focussing on them as we work on the next budget cycle.

In the meantime, you might be interested in some statistics that I have just obtained from NSF. If one focusses only on the group of investigators who have been successful in terms of having their proposals funded, we find that on average these individuals have submitted 1.9 proposals during the past year and that, moreover, fully 50 percent of the second proposals have been funded. What this illustrates is simply that the success rate parameter is not as clean-cut as one might hope and I have some people working on an attempt to obtain at least more reliable information.

There is no question, however, that there is real pain in all the community--physical as well as biomedical--and this Administration recognizes the problem as one that we have to address, both internally and with the Congress.

Again, many thanks for keeping me informed and with warmest best wishes,

Sincerely yours,



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

Professor James Krumhansl
Laboratory of Atomic and Solid State Physics
Clark Hall
Cornell University
Ithaca, New York 14853

THE WHITE HOUSE
WASHINGTON

June 13, 1990

Dear Professor Khlopov:

I am responding to your letter of May 16 in which you raise the question originally posed by Andrei Sakharov concerning the possibility of a specific development of a USSR-USA cooperation on cosmoparticle physics/particle astrophysics.

As you know, we already have 10 bilateral agreements in place between the USSR and the USA and only a few weeks ago I had the privilege of chairing a meeting of the Joint Commission on Basic Research. I have also, since 1972, had the honor of being a member of the US side of the Joint Coordinating Committee for Fundamental Research on the Properties of Matter that was established during the original Nixon-Brezhnev talks in 1972. Under this latter agreement, as you know, we have had very active collaboration in particle physics with large numbers of Soviet and American investigators working on a reciprocal basis at Fermi Lab, at SLAC, and at Novosibirsk for example. I believe that the Joint Commission on Basic Research will also provide an umbrella under which it would be entirely possible to establish much more extensive collaboration of the kind that you outline in your letter. That particular agreement has the unique feature that the scientific programs that will be placed under it are those which develop from the bottom up rather than from the top down and arise from the initiative of individual investigators or individual institutions.

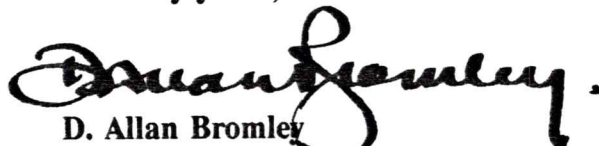
As you note in your letter there is a very natural coming together of particle physics and cosmology and I agree that excellent work is being done in the joint field both in your country and in mine. You can therefore count on my assistance in working to assist any initiatives in this area either under the Joint Commission on Basic Research or under the older Joint Coordinating Committee for Research in the Fundamental Properties of Matter.

Many thanks for sending me a copy of your manuscript entitled The Project Program of Fundamental Studies on the Problem "Cosmoparticle Physics" in the USSR. As you note, the Bahcall Committee of the National Research Council is currently finishing up

the most recent study of astronomy and astrophysics in the United States and I am quite sure that the report will touch heavily on similar science.

With all best wishes,

Sincerely yours,

A handwritten signature in black ink, appearing to read "D. Allan Bromley", with a large, stylized flourish extending from the end of the name.

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

Professor Maxim Yu Khlopov
Scientific Secretary
of the USSR Academy of Sciences
Keldysh Institute of Applied Mathematics
125047, Moscow, Miusskaya Pl.4
USSR

THE WHITE HOUSE

WASHINGTON

June 13, 1990

Dear Dr. Kitagawa:

Many thanks for your warm letter of May 9 concerning the White House Conference where we had the pleasure of meeting. I am pleased to learn that you carried the results of the Conference to your Prime Minister, Mr. Toshiki Kaifu, and the Members of the Cabinet. I am happy also that you feel that the Conference succeeded in its major goal of promoting further international activities on global environment and particular the work of the IPCC.

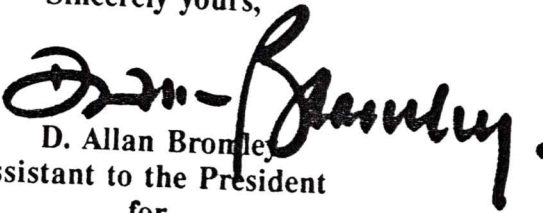
We in the United States remain convinced that the IPCC constitutes the appropriate international forum for these discussions, and our goal in the Conference was that of bringing together the scientific, economic and environmental research communities to try to obtain better communication among them, and better recognition of the needs of the respective groups in terms of data and analyses. To that effect, I believe that we have achieved some success and the comments that we have received from around the world subsequent to the Conference bear this out.

We will shortly be sending to you the formal record of the Conference, including the presentations and the rapporteur's record of the discussions in the three working groups.

I look forward with pleasure to working with you and your colleagues as we move forward to address other aspects of this very important international issue.

With warmest best wishes,

Sincerely yours,


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

Dr. Ishimatsu Kitagawa
Minister of State and
Director General
Environmental Agency
Government of Japan
1-2-2 Kasaumigaseki, Chiyoda-Ku
Tokyo, Japan

THE WHITE HOUSE

WASHINGTON

June 13, 1990

Dear John:

This is a belated reply to your letter of April 25 which answered some of the questions raised by Darman and Boskin at an earlier DPC working group meeting. The answers that you have obtained I think are very reasonable ones and I shall certainly retain them for future use as required.

There are times when I am more than a little convinced that the chaos is not limited to the actual atmosphere in terms of our policy making in that area!

I wanted to take this opportunity to specifically express to you my thanks for taking on the thankless task of leading the U.S. Delegation to the Bergen Conference. I know that you did it with some reluctance and with practically no warning but as I knew you would carry it off in fine style.

Again, my thanks.

Sincerely yours,



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

Dr. John A. Knauss
Under Secretary for
Oceans and Atmosphere
Department of Commerce
Washington, D.C. 20230

THE WHITE HOUSE

WASHINGTON

December 20, 1990

Dear Leon:

Thank you for your invitation to participate in the release of Science: End of the Frontier?, but I will not be able to do so. I wish you the best of luck with it and hope that it does much to strengthen the support for principal investigators in the United States.

Sincerely yours,



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

Dr. Leon M. Lederman
The Enrico Fermi Institute
5640 Ellis Avenue
The University of Chicago
Chicago, Illinois 60637-1433

THE WHITE HOUSE

WASHINGTON

July 6, 1990

Dear Manuel,

I want to thank you for your recent letter of congratulations on FCCSET progress to date. The assistance of the Department of the Interior in achieving that progress is very much appreciated. I am sure your designated representatives to the seven FCCSET committees will be fully responsive to the needs of the committee chairmen.

Sincerely yours,



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

The Honorable Manuel Lujan, Jr.
Secretary of the Interior
18th and C Streets, N.W.
Washington, D.C. 20240

THE WHITE HOUSE

WASHINGTON

January 29, 1990

Dear Mr. Liles:

This is just a brief note to congratulate you on the material that you provided to me during my visit to your school last week. Over this past weekend, I have had an opportunity to read the "Guide to Photography" and the "Short Course on the Basics of Computer-Aided Design and Drafting," as well as the pinhole camera instructions. These are excellent documents, and I only wish that vastly more of our young people in this country had the benefit of being exposed to programs like yours.

Let me then only extend to you my congratulations on outstanding leadership in your area of education and wish you every success in your continued career.

With all best wishes,

Sincerely yours,

A handwritten signature in black ink, appearing to read "D. Allan Bromley". The signature is fluid and cursive, with a long, sweeping underline that extends to the right.

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

Mr. Joseph Liles
The North Carolina School
of Science and Mathematics
P.O. Box 2418, 1219 Broad Street
Durham, North Carolina 27715

cc: Mr. John Friedrich

THE WHITE HOUSE
WASHINGTON

January 29, 1990

Dear Dr. Lederman:

Many thanks for sending me a copy of your excellent paper entitled, "The Differing National Civilian Technology Strategies of Leading World Traders," that is scheduled to appear in the first issue of the ASME-Wiley technology management quarterly. I enjoyed reading the paper and learned a lot from it.

With all best wishes,

Sincerely yours,

A handwritten signature in dark ink, appearing to read "D. Allan Bromley". The signature is fluid and cursive, with the first name "D. Allan" and last name "Bromley" clearly distinguishable.

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

Dr. Leonard L. Lederman
Special Analytical Studies Section
Division of Science Resources Studies
National Science Foundation
Washington, D.C. 20550

THE WHITE HOUSE

WASHINGTON

June 13, 1990

Dear Leon:

Many thanks for your note of May 22 concerning the Academy in its present status. I recognize only too well the difficulties you are experiencing in getting this new activity under way but I want to congratulate you for the superb leadership that you have provided for this activity. The work that you and your associates are doing in the Chicago is a model for activity throughout the country.

Once you get your bylaws and statutes in a form where they can be distributed I would very much appreciate receiving a copy.

With respect to money I find myself in a strange situation as the famous cartoon featuring the gal and the chimpanzee illustrated while we are supposedly responsible for coordinating a 71.2 billion budget for research and development we have great difficulty at times finding the funds we need for our activities. In your particular case I would think that from what I have heard from Jim Watkins that the DOE would be an enthusiastic supporter.

I shall look forward to hearing from you, and in the meantime, warmest best wishes,

Sincerely yours,



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

Dr. Leon Lederman
Chairman
Steering Committee for the Academy
for Science and Mathematics Teaching
% Education Office
Fermilab, MS 777
Post Office Box 500
Batavia, Illinois 60510

THE WHITE HOUSE
WASHINGTON

July 5, 1990

Dear Dr. Luce:

Thank you for your letter of June 25. I agree with you on the importance of finding good leadership for the National Science Foundation.

Dr. Mary Good has agreed to head the search committee for the Director. I am pleased to pass along your recommendation to her. Nominations such as yours are a valuable resource to assure consideration of the very best candidates for key government positions.

I greatly appreciate your taking the time to write.

Sincerely,

A handwritten signature in black ink, reading "D. Allan Bromley". The signature is fluid and cursive, with a large, stylized "D" at the beginning and a long, sweeping underline.

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

Dr. R. Duncan Luce
Director
Irvine Research Unit in
Mathematical Behavioral Sciences
University of California, Irvine
Irvine, California 92717

THE WHITE HOUSE

WASHINGTON

July 6, 1990

Dear Dr. Lumbroso:

Many thanks for your letter of June 19 telling me of your return to France.

I should like to take this opportunity to congratulate you on your service to the cause of improved French-American relations during your tour of duty here in Washington.

As you know, over the years I have had a number of opportunities to become associated with the CNRS in activities both in France and in my own laboratory at Yale where we have had the great pleasure of having a number of your colleagues as both long and short-term visitors.

Let me take this occasion to wish you every success and happiness in your new career posting back in France. I look forward to the possibility that our paths will cross again in the not too distant future.

Sincerely yours,


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

Dr. Albert Lumbroso
Director
CNRS Washington Office
4101 Reservoir Road, Northwest
Washington, D.C. 20007-2176

THE WHITE HOUSE

WASHINGTON

July 12, 1990

Dear Barney:

Many thanks for your letter of June 21 in which you bring me up to date on the situation with respect to SETI--and also for the earlier mailing with the excellent brochures and documentation on the proposed program.

I am aware of the difficulties with the Congress and unfortunately, my reading is that there is very little possibility of the Congress acting positively this year given the tremendous deficit pressures and the massive cuts that are already being discussed in the President's request for NASA.

At the same time, this whole area of SETI is one that I have found fascinating for a great many years and one that modern technology makes into a vastly more realistic enterprise now than it was even a few years ago. The plan that you proposed as part of our observation of the 500 anniversary of the generally recognized European discovery of America is a very attractive one.

I will look into the possibility of doing something through the Space Council or PCAST and be back in touch with you.

I must say that had either of us been asked to predict what changes might occur in the Soviet Union when we were there a decade or so ago, I am afraid that all of us would have missed by huge margins the dramatic developments that we have seen in this past year. For purely accidental reasons it turns out that the person who has just been named as Gorbachov's Science Advisor, academician Yuri Ossipyan, is an old personal friend of a great many years standing and someone who succeeded me in the Presidential succession for the International Union of Pure and Applied Physics. This personal contact has made it possible for us to have a variety of extremely useful backchannel discussions over the past few months, and I anticipate that these will continue. Both of us, however, have substantial worries about the possibility of the Soviet Union executing the transition from a centrally controlled to a market economy in any smooth fashion. However it is done, I am afraid that the Soviet people have some rough days ahead and I am convinced that during such times it is even more important than usual for us to maintain our scientific communication channels as open as possible because there will be many opportunities for misunderstandings.

It was good to hear from you and if your travels bring you to Washington I would welcome an opportunity to talk with you. Please do let me know if and when you have any such plans.

With warmest best wishes,

Sincerely yours,

A handwritten signature in black ink, appearing to read "D. Allan Bromley".

D. Allan Bromley
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

THE WHITE HOUSE
WASHINGTON

June 13, 1990

Dear Rich:

Many thanks for your letter of May 29 with which you enclose a copy of the AAAS Board resolution on the use of animals in research testing and education.

This will be a most helpful resolution in a very important issue and I am indebted both to you and to the Board for making it available.

Please convey my thanks to the Board and assure them that I will see that this resolution comes into the proper hands.

Let me again take this opportunity to express to you my sincere appreciation for your hospitality at the Occidental. The opportunity to bring together the AAAS Board of Directors and the President's Council of Advisers on Science and Technology was too good a one to miss. I know that all of our people enjoyed the evening immensely and the many conversations emphasized the important role that AAAS can and should play as the only scientific organization that can rightly claim to represent the entire spectrum of scientific and technological activities in the country.

With warmest best wishes,

Sincerely yours,



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

Dr. Richard S. Nicholson
Executive Officer
American Association for the
Advancement of Science
1333 H Street, Northwest
Washington, D.C. 20005

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
05. Letter	To: G. Laustriat From: Allan Bromley Re: Walter Greiner [personal information redacted] (1 pp.)	6/13/90	(b)(6)	

Collection:

Record Group: Bush Presidential Records

Office: Science and Technology Policy, Office of (OSTP)

Series: Bromley, D. Allan, Files

Subseries: Correspondence Files

WHORM Cat.:

File Location: D. Allan Bromley Correspondence - Presidential - A-Z [1 of 5] [1990]

Date Closed:	2/10/2010	OA/ID Number:	62004-010
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

THE WHITE HOUSE
WASHINGTON

June 13, 1990

Dear Irv:

Many thanks for your note of May 27 and the enclosed article about the Swedish efforts to phase out nuclear energy. I am afraid that their timing is rather poor inasmuch as the implementation of their decision is now running head-on into the converted environmentalists who now believe that nuclear power may offer us the only hope of cutting back on the carbon dioxide loading in our atmosphere.

I remain convinced that in this country we will never see additional nuclear plants ordered without our developing a totally new technology that can be built and certified in standard form and installed in modular fashion. The Department of Energy is currently working on such designs as are Westinghouse, General Electric and General Atomics but it will certainly be some time before any of the new designs are ready for implementation. I remain convinced that nuclear fusion remains substantially farther into the future, however, and the pressure from the environmentalists may be what is needed to at least accelerate the process of developing the new reactor designs.

It has been a long time since our paths crossed and I hope that you are enjoying life in Seattle.

I have heard through various grapevines that you have had some cardiac problems as you may know I have as well starting back in 1983, when what would otherwise have been a routine bypass surgery resulted in my being given a systemic infection with a very potent bacterium, *serratia marcescens* unhappily named after a rather ineffective Italian physicist, Serafino Serratia, whom the Italians felt Robert Fulton had deprived of the appropriate credit for the invention of the steam boat and so in substitution it was decided to name this particular bacterium, the one responsible for most of the miracles in the Middle Ages, after him. The miracle association arises from the fact that when *serratia* operates in an anaerobic atmosphere, it produces a blood red liquid exudate and unquestionably was responsible for the hoards of bleeding statutes and other phenomena so common during parts of the Middle Ages.

I hope that you have now recovered your normal health and that you have a long and happy life ahead.

With warmest best wishes,

Sincerely yours,

A handwritten signature in black ink, appearing to read 'D. Allan Bromley', with a stylized, sweeping flourish extending to the right.

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

**Mr. Irv Pollack
946 Broadway East
Seattle, Washington 98102**

THE WHITE HOUSE

WASHINGTON

Jan 8 As

Memo to: Sam Ratchford

From: Allan Bramley

Re: DE / NSF Review

Sec. Caragos suggests that our
contact person in DE should
be

Dr. Charles Kolb

Deputy Under Sec.

Office of Planning, Budget
and Information.

Seems a bit strange but there it
is. Caragos has asked Kolb to call
me and will let you know as soon
as he does.

Allan

THE WHITE HOUSE

WASHINGTON

January 29, 1990

Dear Marian and Irv:

It was very thoughtful of you to notice the New York Academy of Sciences award, and the flowers are magnificent!

Pat and I were in Hawaii from January 12 through the 20th, although unhappily this year -- in striking contrast to the wonderful weather we experienced in previous years -- it rained steadily for seven days. We did get a great rest.

Life continues to be hectic and oscillates between being exciting and daunting. This week, in particular, should be interesting, because the President's 1991 budget is released Monday morning, and I have a major press conference in the afternoon concerning the science and technology components of it. Within the next two weeks I am scheduled to testify before various Congressional committees on nine separate occasions, and this coming Saturday the President is hosting the first meeting of his Council of Advisers on Science and Technology (PCAST), that I chair, at Camp David. This is the first time that anything of this sort has happened, and it starts off our Council with flying colors. Happily, too, the President has nominated the third and fourth of my Associate Directors to the Senate, and I expect that their confirmation will be completed in a few weeks, so that all of my senior staff will be in place.

Pat has only four more treatments to go and, as you can imagine, is very much looking forward to getting them behind her. We have found a number of specialists in various areas in the Washington medical community but, quite frankly, both of us feel an enormous gap, because over the years we had come to depend so much on Irv for superb advice and treatment no matter what the difficulty. Our temporary departure from New Haven simply emphasizes to us what a truly remarkable physician you are.

Pat joins me in sending you both our very warmest regards and best wishes. We look forward to seeing you soon, and we deeply appreciate your thoughtfulness.

Sincerely yours,

A handwritten signature in dark ink, appearing to read 'D. Allan Bromley', with a long, sweeping horizontal stroke extending to the right.

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

Dr. and Mrs. Irving Polayes
49 North Racebrook Road
Woodbridge, Connecticut 06525

THE WHITE HOUSE

WASHINGTON

July 6, 1990

File:
Fay Aizenberg
Selove

Dear Fay:

It was great to hear from you and to get the information on the Kiev meeting. As you suspected, I particularly appreciated Appendix C.

I can well understand that the conference itself must have appeared a bit stilted with English as its official language. Somehow it brings back memories of the days when our children were taught to swim at the Yale pool and the opening approach taken was simply to throw them into the pool at the deep end to see what would happen. Strangely enough, in my daughter's case, it resulted in her becoming a very accomplished swimmer while in my son's case it resulted in a life-long aversion to water in anything but potable form!

I was glad to get the news about Vadim and Anna and find it difficult to believe he has reached an age when retirement would be even vaguely reasonable. On the other hand, I must tell you that 18 months ago Pat and I went back to Queens University in Kingston Ontario for my 40th reunion and I found to my absolute amazement that I was the only one of the 80 some returning members of the class of 1948 who was not already retired. To be honest about it, most of them appeared bored to tears.

Many thanks for the comments about the Academy. At least one of the minor advantages of being on the inside is that it becomes possible to learn what was happening all those years while the black ball was being applied. I have never ceased to be amazed at the pettiness of some of our colleagues! My goal at the present is to do everything I can to see that more nuclear physicists are elected to this organization--one from which they appear to be to have been systematically excluded for a very long time.

It is in many ways great to hear that you and Wally are being overworked because it implies that both of you are now fully recovered and in full fighting trim. I regret to say that Pat has been quite ill for the past year but we are hopeful that things are beginning to look up. Unfortunately, this has made it impossible for her to really enjoy many of the rather unique opportunities that Washington provides or to take up some wonderful opportunities that have appeared for her to continue her work as a professional archivist. We are hoping that next year will be vastly better.

It seems hard to believe that you are about to give up "The Energy Levels of Light Nuclei" and let me both personally--and on behalf of every nuclear physicist in the entire community--express to you the heart-felt thanks that we all owe you for a fantastic piece of work over these past 38 years.

It does indeed seem difficult to believe that it could have been that long and I am remembering in detail our parallel activities of even somewhat older vintage on the (d, n) reaction on fluorine 19!

It was great to hear from you and Pat joins me in sending you and Wally our warmest best wishes. If your travels ever bring you to the Washington area, and if you give me a bit of warning, I would be delighted to take you to lunch at the White House Mess.

With warmest best wishes,


Sincerely yours,



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

Professor Fay Ajzenberg-Selove
Department of Physics
University of Pennsylvania
Philadelphia, Pennsylvania 19104

THE WHITE HOUSE

WASHINGTON

June 13, 1990

Dear John:

Garvey it is and please let me know how I can be of help.

And once again, many thanks for your help in my own case.

With all best wishes,

Sincerely yours,



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

Dr. John P. Schiffer
Department of Physics
Argonne National Laboratory
9700 South Cass Avenue
Argonne, Illinois 60439

THE WHITE HOUSE

WASHINGTON

June 13, 1990

Dear Maxine:

Many thanks for sending me a copy of your letter to Senator Glenn concerning the proposed National Institutes for the Environment.

While I support the general thrust of Senator Glenn's activities, I am currently engaged in trying to make the scientific component of EPA a much more high quality one because I have been depressed by the quality of its activities and by the low reputation in which it is held externally. Now that there is the high probability of EPA becoming a Cabinet agency, it seems to me appropriate to take the opportunity to make a major change in the level of research activity moving EPA from what up to now has been a role as a primarily regulatory body.

With warmest best wishes,

Sincerely yours,



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

Dr. Maxine F. Singer
President
Carnegie Institution of Washington
1530 P Street, Northwest
Washington, D.C. 20005

THE WHITE HOUSE

WASHINGTON

June 22, 1990

File Wancy

Dear Tzu-fang:

This is a very much belated reply to the card that we received from you at New Years, but I hope that you will understand that Mrs. Bromley has been ill and that most of our correspondence is way, way behind schedule.

First of all, warmest congratulations on your marriage and on the arrival of your daughter on December 6. By now she will have reached a very interesting stage. We have two granddaughters, one of whom is just a little older than your daughter, so we have some feeling for how wonderful little girls are at this stage. Unfortunately, our granddaughters live in Woodside, California, so we don't see them as often as we would like.

I was sorry to hear about the close down of the RIB facility and hope that you will send me reprints of the two papers that you mentioned. Unfortunately, budget stringencies are going to make life difficult for everyone for the next few years, although the Bush Administration is making a very special effort to protect research and development in any budget crunches that develop.

I am not familiar with the work that you are doing on the shape isomer problem and will look forward to hearing more about it. With whom are you doing this work and on what facility?

You mention that you are about to move from the Livermore to the Danville area and I have to admit that I do not know where Danville is, but assume that it must be somewhere in the Valley.

I hope that you and your wife have been taking advantage of some of the great vineyards in the Livermore area. I remember with particular pleasure the occasions on which we visited the Wente vineyard and its spectacular restaurant.

I am sure by now too that you will have become acquainted with a number of the other alumni of the Wright Laboratory including Gary Bourgogne, Hank Shay, and Tom Cowan.

You asked how life is in my new position and the answer varies almost from hour to hour. I have spent a substantial amount of time recruiting staff for the Office of Science and Technology Policy (OSTP) and now have about 40 full-time people and about 70, including part-time folk, who spend some time with us from different agencies on special projects. I have spent a fair amount of time rebuilding bridges between

OSTP and the Office of Management and Budget as well as other White House offices and between OSTP and the Congress. These had largely disappeared in recent years and are extremely important. Since I am the only Assistant to the President (there are about a dozen in all) who is also Senate confirmed, it means that when the Congress decides for whatever reason to find about or to beat up on the Administration, I get called to testify. I have done so 18 times since the first of February and, although each of these appearances very much resembles a PhD oral, it is possible to get somewhat used to them. I have been extremely fortunate in the people whom I have been able to convince to join me and for the first time in the history of the office all four of the Presidentially-appointed, Senate confirmed Associate Directors are in place so that we span a much greater area of activity than has been the case in the past.

You asked what the major differences are with life at Yale and this would take a very long answer indeed but perhaps one of the more obvious ones is that I now get to the office before 7:00 am to be able to participate in the meeting of the President's senior staff that occurs every morning at 7:30 am. The end of the day can be at almost any time but I have been making a determined effort to keep the weekends clear.

I was up to New Haven a few days ago for the first time this year to give a talk and had a chance to stop by the lab briefly. The ESTU machine is running beautifully and data have been taken at 21 million volts on terminal, well above what we had claimed we would be able to do when the project was first produced. Not only are a large number of Yale students hard at work on their degrees but also a significant number of users have begun to show up from Rutgers, from the University of Pennsylvania, from Rochester, as well as from a number of the European laboratories so that the flow of people is more or less back to normal after an extended period during which the new machine was constructed.

It was good to hear from you and I hope that all goes well. Please do keep in touch. It is always a great pleasure to hear from you to learn what you are up to.

With warmest best wishes,

Sincerely yours,



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

Dr. Tzu-fang Wang
Department of Physics
Lawrence Livermore National Laboratory
Livermore, California 94550

THE WHITE HOUSE

WASHINGTON

June 22, 1990

Dear George:

Many thanks for your news filled letter of June 1. The Gorbachov visit was indeed an historic one and I had plenty of opportunity to be involved in that apart from the official sessions, I attended the luncheon which he gave for "American intellectuals" as the only governmental representative and then Pat and I attended the State dinner held in honor of President and Mrs. Gorbachov in the White House. I also spent quite a bit of time with a group of Soviet academicians who were supposed to be discussing science and technology but who actually spent most of the time asking for help and advice concerning the conversion of the Russian economy from a centrally planned one to a market one. It became very clear in these discussions that the Soviets really have no idea what a market economy is all about and the fact that a prime requisite is that the government get completely out of the market. What they seem to be doing is attempting to go from one centrally planned economy to a different one, and moreover, are attempting to do so in a painless fashion. It was made clear by all the American economists present that there is no painless way for the Soviets to adjust their stated value of the ruble to its true value in the international market place, and that a rather major period of depression is an inevitable price that the Soviets must pay for becoming part of the world community. It is not at all clear that the Soviets at the present are prepared to admit this.

A rather interesting development is that one of my old friends of a great many years standing, namely Yuri Ossipyan, has now replaced Velikhov as Science Advisor to the Soviet President and obviously he has the full confidence of the Gorbachovs as was demonstrated repeatedly during this visit. You will remember Yuri from IUPAP activities. He will be taking over as President from Larkin Kerwin at the General Assembly scheduled for Dresden in, what at the moment is East Germany, sometime toward the end of September.

This letter will be waiting for you on your return from the UK and it sounds like the Bentley Drivers' Club is maintaining its standards. I am sure that you will enjoy the tour of the Beaujolais country and the tour itself.

The presentation of the RSA medals must have been a grand occasion and I am sure that you enjoyed it as well.

Pat has been quite ill all year and has been spending time in hospital recently for treatments. Fortunately these are beginning to show signs of actual benefit, but it has been a very difficult year for her and we have done very little traveling and very little of a social nature.

She joins me in sending our warmest best wishes and we will look forward to hearing from you when you return from Europe.

Sincerely yours,

A handwritten signature in black ink, appearing to be 'D. Allan Bromley', written in a cursive style.

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

Mr. George W. Wood
25 Wood Neck Road
Falmouth, Massachusetts 02540

George W. Wood
25 Wood Neck Road
Falmouth, Massachusetts 02540

June 1, 1990

Dear Allan and Pat

I hope you continue to survive the Washington heat race. I've just been watching the Ceremonies at the White House between Gorbachev and Bush. Very historic. I kept looking for you among the audience, but in vain. Yet in many recent events I fancy I have seen your hand. And after all, the important thing is achieving your goal, regardless of credit and public notoriety! I'm sure your time has been more than full with recent events. Hang in there!

On Tuesday I'm off to my annual visit to the U.K. This time Jess, Ray and I will drive to Italy to visit an old friend for about a week after which we drive to the Beaujolais Country of France for a week with 50-60 cars of the Bentley Drivers Club. Then back to the UK for a week or so and then home July 3.

This will be my second trip to London in as many months. I made a trip to attend the RSA Medals Ceremony at Windsor Castle hosted by Prince Phillip on April 24. It was an occasion not to be missed and most enjoyable.

I hope you are both well and finding the life at the peak of political power fascinating - if not exhausting.

Fond regards,

George

THE WHITE HOUSE
WASHINGTON

January 29, 1990

Dear John:

It was good of you to take time to meet with me while I was in your state recently, and I much enjoyed our discussion. In particular, I will keep in touch with you concerning the importance of having the governors fully involved in reviewing the National Energy Plan as it evolves.

I also enjoyed chatting with Tom Hayward and Roger Ulveling and look forward to meeting with Tom and Dr. Coleman here in Washington on January 30.

Although unfortunately the weather on the big island did not cooperate, I did have an opportunity to talk at length with Bill Coops and with Maurice Kaya about the very innovative work that you have underway in geothermal and ocean thermal gradient energy systems, as well as the imaginative ancillary programs in aquaculture, in what is really an amazing variety of areas. These are exciting programs and ones that exploit your unique resources in very effective fashion. I shall be very interested in keeping in touch with these programs as they develop.

It was very thoughtful of you to arrange for us to have the papayas and the marvelous assortment of macadamia nuts to bring back with us, and the leis were beautiful ones. My wife was particularly delighted by hers and has asked me to express to you her appreciation.

Our week in Hawaii, unhappily, did not coincide with the sunshine that we have come to expect, but we nonetheless had a very relaxing and enjoyable time.

If you find yourself coming to Washington, please do let me know; I would very much look forward to meeting with you if you have the time available.

Again, my thanks for your warm hospitality, and with all best wishes for continuing leadership and success,

Sincerely yours,

A handwritten signature in black ink, appearing to read 'D. Allan Bromley', with a long, sweeping horizontal line extending to the right.

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

The Honorable John Waihee
Governor
Executive Chambers
Hawaii State Capitol
Honolulu, Hawaii 96813

Prof. Dr. Werner Weidenfeld
Coordinator for German-American Cooperation
in the Field of Intersocietal Relations,
Cultural and Information Policy

5300 Bonn 1,
Federal Foreign Office
Adenauerallee 132 a
Federal Republic of Germany
Telephone (02 28) 17 - 26 61 (26 86)

*German
dictation*

Dear Mr. Bromley,

I send you the Season's Greetings and wish you happiness and success in the coming year.

The year 1989 draws to its close. It has manifested the desire for freedom of the people in Central and Eastern Europe. The scenes in Berlin, Budapest, Prague and Warsaw will long remain in our memories.

The year ahead will make even greater demands on us. 1990 will reflect the common will of all Europeans to shape their future together. In this process we shall have to make a special effort to expand and strengthen the community of European and North American democracies that has grown from their cultural and historical roots.

Please regard the enclosed book as a token of our good cooperation and friendship.

Sincerely yours,

Werner Weidenfeld

*German Book in the 20th
Century*

THE WHITE HOUSE
WASHINGTON

January 29, 1990

Dear Professor Weidenfeld:

Many thanks for your note and for the marvelous book entitled, German Art in the Twentieth Century.

I am entirely in agreement with you that the years ahead will make even greater demands on us than in the past and that close cooperation between our countries can play an important role in establishing the future directions in much of world activity.

I look forward with pleasure to working with you.

With all best wishes,

Sincerely yours,

A handwritten signature in dark ink, appearing to read "D. Allan Bromley". The signature is fluid and cursive, with the first name "D. Allan" written in a larger, more prominent script than the last name "Bromley".

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

Professor Dr. Werner Weidenfeld
Federal Foreign Office
Adenauerallee 132 a
5300 Bonn 1,
Federal Republic of Germany

THE WHITE HOUSE
WASHINGTON

September 11, 1990

Dear Viva:

I am sorry that I missed you before you took off for the new year at Oxford, but simply wanted to tell you that you had done a marvelous job here at OSTP. I have read your paper on Eastern Europe with very real interest and know that it will be extremely useful to all of us as we move forward on at least some of the recommendations that you have made.

Quite apart from all the hard work, all of us here at OSTP were delighted to have you as a member of the family this summer and we hope that you will always stop by whenever you are in the Washington area.

You were good enough to send me a copy of your letter to Dr. Logsdon and I must say that you have a fascinating future ahead. As I mentioned when we last talked, if there is anything that I can do at any time to help in terms of that future, please do not hesitate to call.

I look forward to seeing you soon and hope that you had a chance to stop by to see Mary Anne and everyone at the laboratory on your way back to Oxford.

Sincerely yours,



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

*Barth! luck!
- ym... it need it
however!!*

Ms. Viva Bartkus
Magdalen College
Oxford, England
OX1 4AU

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

August 23, 1990

Dear Dr. Logsdon:

I am writing today to thank you for the opportunity that your efforts and the generous funding from the Carnegie Commission for Science, Technology, and Government have provided for me in form of a summer fellowship at the Office of Science and Technology Policy (OSTP). My experience these past three months has been very rewarding, and I hope that other graduate students will be able to benefit from such a fellowship in subsequent years.

I would like to take this opportunity to tell you a little bit about myself and my summer work at OSTP. A native of Indiana, I matriculated at Yale University in the Fall of 1985. In addition to playing on the Yale Women's Varsity Volleyball Team and acting as the scout leader of a New Haven inner-city boy scout troop, I was able to graduate after four years, summa cum laude, with both Masters and Bachelors degrees in economics. During my Senior year, I participated in the rigors of applying for a Rhodes Scholarship and was fortunate to have been awarded one. This spring I completed my first year at Oxford University in England, where I am working on a Ph.D. in International Relations, focusing specifically on economic and political problems of the Baltic states. This topic is very close to my heart, since I grew up speaking Lithuanian at home as both of my parent were born in Lithuania and only arrived in the United States in 1949. Besides studying at Oxford, I am also captaining the Women's Varsity Volleyball team, rowing on the University Lightweight Crew Team, and participating in debates held by the Oxford Union.

Having worked for Dr. Bromley for three years while a student at Yale, I was eager to have the opportunity to work for him at OSTP. The summer has been fascinating in a number of respects. I have worked on a variety of projects, although I would like to describe two in particular. First, I worked closely with several colleagues at OSTP on drafting a concepts paper on the possible establishment of three regional institutes dedicated to doing research into the science and economics of global change. President Bush announced U.S. support for the envisioned regional institutes in his closing remarks at the White House Conference on Global Change in April, 1990. Our main focus was to come up with different options for the organization, management, funding, membership, objectives, and functions of the regional institute to be located in the Western Hemisphere. I worked closely with colleagues from Departments of State, Agriculture, and Commerce, the National Science Foundation and the Environmental Protection Agency in developing the proposals. It is rewarding to think that an institute to which I was able to contribute a few of my own ideas and incites may actually exist one day to do ground-breaking research into such

problems as urban pollution in Mexico City or into the consequences of slash-and-burn practices in the Amazon region.

I worked on the second project independently. I was directed to do a survey and assessment of both public and private sector science and technology initiatives in Eastern Europe. The revolutionary changes of 1989 in Eastern Europe have provided a special opportunity for the United States. The declared goals of U.S. policy toward these countries consist of promoting economic restructuring toward a market system, encouraging the growth of democratic pluralism, providing assistance with severe environmental problems, and cultivating new ties of friendship with the former Warsaw Pact countries. There exists widespread support among the American public and in the Congress to provide assistance to these countries.

I found the investigation into existing U.S. government programs in the region extremely interesting. In fact, many of the technical agencies have been organizing mutually beneficial cooperative research between American scientists and their Eastern European counterparts for years. Some of these programs, like the ones sponsored by the U.S. Department of Agriculture (USDA), the National Science Foundation (NSF), and the National Institutes of Health (NIH), have been operating in Eastern Europe for more than twenty years and have proved sufficiently resilient to weather political upheavals of crisis proportions. When Polish leader General Wojciech Jaruzelski declared martial law in 1981 and the United States broke off diplomatic relations, one of the few U.S. agencies to maintain its contacts and its programs in Poland was USDA. Even during the violent revolution in Romania in November and December, 1989, NIH persevered with its medical research and exchange programs.

When engaging in overseas programs, U.S. technical agencies are required by their mandates to engage in mutually beneficial endeavors. Realization of their missions becomes relatively easier because their projects can build on the existing, well-developed science and technology infrastructure in these countries. A tradition of higher learning has been cultivated for centuries in Eastern Europe at such institutions as the University of Prague (1347) and the University of Krakow (1362), which rank among the oldest in the world. University education and scientific research are among the very few activities that have not stagnated in these countries under communist rule. The situation provides the United States with substantial opportunities: to continue to support world-class cooperative science and technology research, through which the U.S. will be able to help foster economic growth, and thereby trade links as well, and to gain much political goodwill. "Science is the tide that raises all ships," and the express purpose of my paper was to examine the means by which such a wise proverb could be incorporated into the current U.S. assistance initiative in Eastern Europe. After completing my assessment of the situation, I presented to Dr. Bromley a wide range of policy recommendations which could raise the efficiency and effectiveness of U.S. science and technology programs in Eastern Europe.

Besides enjoying my work at the Old Executive Office Building, I also appreciated having the opportunity to explore our nation's capital. Having grown up in a small town in Indiana, I enjoyed strolls around Georgetown, going out to restaurants, and the overall quicker pace of life. Being a lover of art and the theatre, I often went to

explore the National Gallery of Art and the Smithsonian Museums, and even went to performances of the Washington City Opera and the Bolshoi Ballet. I was also able to explore the surrounding countryside, straying as far south as Charlottesville, the University of Virginia, and Monticello and as far north as the Baltimore harbor, Annapolis, and the Naval Academy.

Once again, I must tell you it has been a wonderful summer. I am extremely grateful to you for this opportunity and would strongly encourage you to make such an opportunity available for another graduate student next summer.

Sincerely yours,

A handwritten signature in cursive script that reads "Viva Bartkus".

Viva Bartkus

Dr. John M. Logsdon
Professor of Political Science
& International Affairs
Director
Space Policy Institute
Center for International Studies
& Technology Policy
Elliott School of International Affairs
The George Washington University
Washington, D.C. 20052

cc: Dr. D. Allan Bromley

THE WHITE HOUSE

WASHINGTON

June 13, 1990

Dear Viva:

I was glad to get your letter of May 29 because we have been wondering when we could look forward to seeing you here in OSTP. The arrangement you suggest with your arrival here on Tuesday, June 26 is entirely satisfactory.

When you arrive I may very well still be at the meeting of the President's senior staff and so if I am not in my office you should see Damar Hawkins, whom you met during your last visit. She will set about getting you started on your necessary security clearances. We have arranged that you do not have to take the drug test. And I think all other arrangements can be made after your arrival.

My intention is that you would work with Associate Director Tom Ratchford on International Science matters pertaining to Eastern Europe. But since we a relatively small office, this does not mean that you will not have an opportunity to interact with all of us.

Since you were here, we have made some slight changes in the structure of your appointment with us and, in fact, have arranged for you to be the first George Washington Science and Technology Fellow working here at OSTP. And your salary will be paid through George Washington University by the Carnegie Foundation in New York. From your point of view I think that this will be advantageous because it will, I think, look better on your resume to have been a George Washington Fellow here at OSTP than simply to have been a summer intern.

You mentioned that you would be joining us on June 26 but you did not mention when you would be heading back to Oxford and it would be helpful if you would let me know as soon as possible what your plans are for the end of the summer. I am assuming that you will want to spend some time with your parents before going back but the timing is essentially up to you. We would simply like to know how to plan for most effective use of your time with us. All of us here are looking forward to seeing you and it will be great to have you back in the office again.

Warmest best wishes for every success in your year at Oxford (about which I have not the slightest doubt) and the hope that you will find the summer with us both rewarding and enjoyable.

Sincerely yours,

A handwritten signature in dark ink, appearing to be 'D. Allan Bromley'.

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

Ms. Viva O. Bartkus
Magdalen College
Oxford University
Oxford, England, OX1 4AU

THE WHITE HOUSE
WASHINGTON

January 10, 1990

MEMORANDUM FOR JOHN H. SUNUNU

FROM: D. ALLAN BROMLEY *Allen*
SUBJECT: Our Meeting at 2:30 p.m. with the President

1. The April Science and Economics Conference
 - a) We need the President's approval of the list of participating nations.
 - b) If he approves, I have included herewith a draft of a possible letter of invitation that the President might wish to send to the appropriate Heads of State.
2. The President's Council of Advisers on Science and Technology (PCAST)
 - a) I have enclosed a listing of what I believe to be the necessary steps in moving forward to our February 3 meeting.
 - b) I have enclosed a list of possible issues from which I hope that the President would be willing to select two or three that we will then include in the meeting agenda as those for in-depth discussion.
 - c) I enclose a tentative agenda for the meeting -- sans these topics.
 - d) Finally, I enclose a memorandum to the President that covers the establishment of PCAST in broad detail.
 - e) I would remind you that you have agreed to find out the President's wishes regarding invitations to additional persons wishing to attend the Camp David meeting. From the EOP staff, Dick Darman and Michael Boskin have already talked to me on two occasions about their interest in attending. I will, of course, be delighted to have them for my part but recognize fully that this is the President's decision.

I enclose herewith a listing of the OSTP people whom I would like to include but again will fully understand if the President wishes to reduce the numbers.

NOTE:

- (A) Although I am assured by Boyden Gray's staff that all PCAST members will be cleared in time for the February 3 meeting, the fact is that as of this moment the following do not have complete FBI clearances:

- (i) David Packard
- (ii) Walter Massey

I clearly do not understand the delay here, since both of the above have been cleared many times in the not-too-distant past. We may need to invoke the President's power (as I am given to understand) to himself declare such persons cleared.

- (B) The requirement that all advisory committee meetings -- with certain very specific exceptions that may well not apply here -- are required to be open to the public conflicts with the private nature of Camp David. The steps that I have listed on the enclosed sheet are designed to take care of this problem.

Attachments

- Tab A Draft letter of invitation to April Science and Economics Conference
- Tab B Listing of Necessary Steps Toward PCAST February 3 Meeting
- Tab C List of possible issues for PCAST meeting
- Tab D Tentative PCAST Agenda
- Tab E Bromley/President re. Establishment of PCAST with attachments

**Draft letter to be sent by the President to Heads of State of Nations
participating in the April 1990 Conference on Science and
Economic Research on the Environment**

Dear _____:

I take pleasure in inviting you to send an official delegation to a meeting that I have called for April 20, 21 and 22, 1990, here in Washington, D.C.

The meeting will be devoted to discussion of the science and economics relevant to policy on environmental matters and, in particular, global warming. Its goal is to provide improved understanding of the analytic tools and data required in addressing these environmental issues. A secondary goal is that of sensitizing members of each of the scientific, economic and environmental research communities to the activities of the other two and of focussing on those aspects of research in science and in economics that are of greatest importance in the formulation of both national and international environmental policy.

By agreeing upon the major gaps and uncertainties in our understanding of these matters, perhaps we can develop a plan in which the expertise, experience and data available in our respective countries can be brought to bear on these environmental matters in an integrated and coherent fashion.

I am requesting that the national delegations comprise the senior scientific, economic and environmental officials, respectively, in each of the participating countries and would therefore appreciate your letting me know, by January 31, who these persons will be in your delegation.

The meeting will occupy three days, April 20, 21 and 22, the latter of which I have designated officially as Earth Day in the United States. It is not my intention that this meeting should duplicate or overlap any of the large number of other meetings that have been scheduled elsewhere during 1990; rather, by focussing on scientific and economic research relevant to environmental matters in a forum where representatives of these communities can interact on a personal level with their environmental counterparts, I believe that we can establish a communication network that will serve all of us well.

I have asked my Science Advisor, Dr. D. Allan Bromley and the Chairman of my Council of Economic Advisors, Dr. Michael Boskin, to cochair this meeting. As soon as you have designated your participants, Drs. Bromley and Boskin will contact them directly to obtain information and suggestions concerning the detailed structuring of our meeting.

I look forward with pleasure to this further step in our joint approach to the problems and opportunities with which our global environment confronts us.

Sincerely yours,

January 10, 1990

STEPS REMAINING IN IMPLEMENTING PCAST

1. Complete clearance of members
Have waivers of conflict of interest signed by the President (or Boyden Gray, if permissible), as soon as they are released by Boyden's office
2. President signs the Executive Order creating PCAST
3. Bromley files PCAST charter with GSA
4. President announces formation of PCAST and names members
5. Fifteen (15) day advance notice of meeting published in Federal Register
6. Determination to close meeting filed by President (or Bromley as Assistant to the President for Science and Technology, as permissible) with GSA
7. Convene meeting in open forum and then declare it closed
8. Proceed with meeting as per agenda.

**THE PRESIDENT'S COUNCIL
OF ADVISERS ON SCIENCE AND TECHNOLOGY
(PCAST)**

POSSIBLE ISSUES

Science and Technology and Economic Growth

Mathematics and Science Education

The Information Revolution

Environmental Science and Global Change

Energy Science and Technologies

New Biological Technologies

Materials Science and Engineering

TENTATIVE AGENDA

Inaugural Meeting of the President's Council of Advisers on Science and Technology (PCAST)

**Saturday, February 3, 1990
10:30 a.m. - 1:00 p.m.
Camp David, Maryland**

Opening Remarks	The President
	The Chief of Staff
Introduction of Members	The Chairman
Brief Tabling of Member Issues	PCAST Members
Discussion of PCAST Functions and Operations	The Chairman
Discussion of Selected S&T Issues of National Importance	Open
Discussion of Future Agenda	Open
Discussion of Initial Panel Activities	Open
Concluding Remarks	The President
Adjournment	

THE WHITE HOUSE
WASHINGTON

January 10, 1990

MEMORANDUM FOR THE PRESIDENT

FROM: D. ALLAN BROMLEY *Anan*
SUBJECT: President's Council of Advisers
on Science and Technology (PCAST)

This Council reports directly to you, Mr. President. You have designated me as Chairman of the Council, and I would recommend, for many reasons, that you designate Dr. Bernadine Healy as Vice-Chairman. The inaugural meeting is now on your schedule for Saturday, February 3, 10:30 a.m. to 1:00 p.m., at Camp David.

The Executive Order forming the Council awaits your signature, pending completion of background checks on prospective members. It is anticipated that all members will be cleared by the time of the meeting.

PCAST will bring a cross-section of the nation's most respected and widely experienced scientific and technical minds from industry, academia and non-profit organizations to bear on major issues facing the country. (The proposed membership roster that you and I have discussed earlier is attached.) All these individuals have agreed to serve if asked, and I would request that you issue a formal press release announcing their appointment as members of PCAST.

The kinds of issues PCAST could address include:

- O science and technology and economic growth;
- O mathematics and science education;
- O the information revolution;
- O environmental science and global change;
- O and many, many others.

PCAST and its subpanels will bring additional scientists from the private industrial sector into the advisory process. This important resource has been relatively untapped in the past, and I would proposed to coordinate some of the PCAST activities with those of the Federal Coordinating Council for Science, Engineering and Technology (FCCSET) committees that, in contrast, are composed of federal executive branch senior personnel only.

I want to take this opportunity both personally and on behalf of the nation's science and technology communities to express to you my sincere appreciation of this hospitality that you are extending to us at Camp David and of the very important and concrete evidence that it provides of your personal interest in matters scientific and technological.

All the members are enthusiastic about the possibility of contributing to the continued success of your Administration through the PCAST mechanism.

Enclosed herewith for your approval is a tentative outline agenda for the Camp David meeting.

Attachments

TAB A Prospective Members of the PCAST

TAB B Tentative Agenda for February 3, 1990
Meeting with the PCAST

NOMINEES FOR MEMBERSHIP
ON THE
PRESIDENT'S COUNCIL OF ADVISERS ON SCIENCE AND TECHNOLOGY
(PCAST)

January 5, 1990

**NOMINEES FOR MEMBERSHIP ON THE
PRESIDENT'S COUNCIL OF ADVISERS
ON SCIENCE AND TECHNOLOGY
(PCAST)**

The following individuals have agreed to serve as members of the President's Council if so requested.

1. **NORMAN BORLAUG** Agriculture
Distinguished Professor
Department of Soil and Crop Science
Texas A&M University

A Nobel laureate, Borlaug is the father of the Green Revolution. He has done much of his work at the International Maize and Wheat Improvement Center in Mexico City but is a U.S. citizen. His credential as an agricultural pioneer, as an environmentalist and throughout the Third World are impeccable. I have worked with him on the Indo-U.S. Presidential Science and Technology Initiative and found him to be extremely effective.

2. **SOLOMON BUCHSBAUM** Industrial Engineer/
Executive Vice President Military Science
AT&T Bell Laboratories

Sol Buchsbaum, an ex-Canadian, happens to be one of the wisest men I know. He served on the President's Science Advisory Committee (PSAC) for a number of years, was chairman of the White House Science Council (WHSC) for its entire existence, and is completely at home both in the private sector world and in Washington. He has special expertise in matters of military science and technology, in communication and computer science and in industrial manufacturing. Dr. Buchsbaum was a recipient of the National Medal of Science in 1986.

3. **CHARLES DRAKE** Earth Sciences
Professor of Geology and Geophysics
Dartmouth College

Drake is one of the nation's most highly respected earth scientists. Over the years, he has served with distinction on just about every significant committee in the earth sciences -- both nationally and internationally. I have worked with him on National Academy/National Research Council panels and have been much impressed by the breadth of his expertise and his statesmanship.

4. **RALPH GOMORY** Mathematics/Foundation
President, Alfred P. Sloan Foundation
Formerly Senior Vice President
for Science and Technology, IBM

Gomory is a very highly respected professional mathematician who served for many years as IBM's Director of Research -- then Chief Scientist. He has just retired from IBM to become president of the Sloan Foundation. His IBM experience in technology transfer, high-tech manufacturing, international sales, etc., together with his foundation connections, would make him a powerful addition to the Council. I have worked with him on a number of panels and have been much impressed by his judgment and creativity. Dr. Gomory received the award of a National Medal of Science in 1988.

5. **BERNADINE HEALY** Biomedicine
Director of Research, The Cleveland Clinic
Immediate Past President, American Heart Association

A professional cardiologist, Healy held a professorship in the Johns Hopkins University Medical School before joining Jay Keyworth as Deputy Director of OSTP for two years prior to accepting her current post. During the past year, she was a member of Bill Graham's White House Science Council. She is broadly experienced in the biomedical area, and I have served with her on a number of panels and committees where I have been much impressed by her wisdom, common sense and professionalism.

I would suggest that Healy be made Vice Chairman of the Council.

6. **PETER LIKINS** Academic Engineer
President, Lehigh University

An electrical engineer by training, Likens has gained international visibility as President of Lehigh -- a representative of an academic constituency that is frequently neglected but of ever-growing importance: the relatively small, high quality engineering school. He was a very constructive, thoughtful member of the Packard-Bromley WHSC Panel on the Health of U.S. Colleges and Universities and would be a very effective Council member.

7. **THOMAS LOVEJOY** Environmentalist
Assistant Secretary for External Affairs
Smithsonian Institution

Lovejoy was a student of Evelyn Hutchinson at Yale and was one of the earliest ecologists. Formerly Vice President for Research at the World Wildlife Fund, he has gained an international reputation for his work in international environmental and ecological science. He has played an important role in current efforts to retain substantial sections of the Brazilian tropical rain forests. I have served with him on the President's U.S./Brazil Blue Ribbon Panel and, during the past year, on Bill Graham's WHSC. He brings a deep knowledge of environmental science as well as experience in international activities and sound judgment to any panel.

8. **WALTER MASSEY** Physicist/National
Vice President for Research Laboratory
and for the Argonne National Laboratory
University of Chicago

One of the most distinguished black scientists, Massey is a solid state physicist/chemist. From Dean of the Graduate School at Brown University, he became Director of the Argonne National Laboratory and then took up his present post where he remains responsible for the management of Argonne. He served for six years as a member of the National Science Board and is a recent past president and currently chairman of the board of the American Association for the Advancement of Science (AAAS). I have worked with him in many capacities and believe that he would be a very effective, thoughtful member of the Council.

9. **JOHN McTAGUE** Chemistry
Vice President and Director of Research
Ford Motor Company

A chemist by profession, McTague was Director of the National Synchrotron Light Source at Brookhaven before joining Jay Keyworth's OSTP as Assistant Director for Physical Sciences. On Jay's retirement, McTague served for almost a year as Acting Director of OSTP before going on to Ford. He has been extremely successful in increasing Ford's interest in, and support for, research. His industrial, Brookhaven and Washington experience would make him a very effective Council member.

10. **DANIEL NATHANS**
Boury Professor of Microbiology
Johns Hopkins University

Microbiology

A Nobel laureate for his work in microbiology, Nathans is one of the true pioneers in the field of recombinant DNA and its offspring, biotechnology. He has devoted much of his research to the understanding of tumor viruses and their role in the induction of cancer. He has an outstanding reputation throughout his field both for research and for statesmanship.

11. **DAVID PACKARD**
Chairman of the Board of the
Hewlett-Packard Company and of the
David and Lucile Packard Foundation

Industrial Engineer

As one of the fathers of Silicon Valley, with an enviable track record both in industry and government (Defense Department), and as a member or chairman of a great number of influential panels and commissions, Packard brings a unique background to any deliberation. He was a very effective member of the White House Science Council during the Reagan Administration, in addition to his many individual activities for President Reagan, e.g., his study of contracting in the Defense Department. He is the recipient of the 1987 Vannevar Bush Award of the National Science Board, and in 1988 he was awarded a National Medal of Technology.

12. **HAROLD SHAPIRO**
President, Princeton University

Academic/Social Science
Economist

An economist by profession, Shapiro was formerly President of the University of Michigan. He has participated actively in science and technology related studies for the National Academy of Sciences and AAAS and is one of the very few social scientists known to me who finds it easy to work effectively with scientists and engineers. I believe that it will be important symbolically for us to have a social scientist of impeccable repute on the Council. The absence of such a person damaged the credibility of the WHSC and the later PSACs.

TENTATIVE AGENDA

Inaugural Meeting of the President's Council of Advisers on Science and Technology (PCAST)

**Saturday, February 3, 1990
10:30 a.m. - 1:00 p.m.
Camp David, Maryland**

Opening Remarks	The President
	The Chief of Staff
Introduction of Members	The Chairman
Brief Tabling of Member Issues	PCAST Members
Discussion of PCAST Functions and Operations	The Chairman
Discussion of Selected S&T Issues of National Importance	Open
Discussion of Future Agenda	Open
Discussion of Initial Panel Activities	Open
Concluding Remarks	The President
Adjournment	

THE PRESIDENT HAS SEEN

1-14-91

THE WHITE HOUSE
WASHINGTON

December 21, 1990

90 DEC 27

PM 8:50

Allan
read into
interest
GB

MEMORANDUM FOR THE PRESIDENT

FROM: D. ALLAN BROMLEY *AN-T*
SUBJECT: Global Climate Change Status Report

This memo is to provide you with a status report on global climate change with regard to the most recent scientific conclusions as well as my estimate of the U.S. position in the world community with respect to this issue.

(1) The present status of knowledge concerning the science of global climate change

The report from the scientific session of the Second World Climate Conference (SWCC) in Geneva last month (747 participants, 120 countries) provides a good summary of the information upon which most countries are basing their discussions as well as their policies and decisions regarding global climate change issues.

o The SWCC agreed that the scientific conclusions set out by the IPCC reflect the international consensus of scientific understanding of climate change.

A few examples of their specific conclusions:

o "Emissions resulting from human activities are substantially increasing atmospheric concentrations of the greenhouse gases. These increases will enhance the natural greenhouse effect, resulting on average in an additional warming of the Earth's surface."

o "Without actions to reduce emissions, global warming is predicted to reach 2 to 5 degrees C over the next century, a rate of change unprecedented in the past 10,000 years."

o "The warming is expected to be accompanied by a sea level rise of 65 cm $\pm$ 35 cm by the end of the next century."

o The Conference noted that, as stated in the IPCC Report, there is substantial scientific uncertainty in the details of predictions of climate change. To narrow the uncertainties, the Conference recommended enhanced research and observational systems for a number of high priority research areas (e.g., oceans, clouds, carbon cycle, polar ice sheets and sea ice).

Your U.S. Global Change Research Program (including space observations of the Earth by EOS) is carrying out key research on these important topics.

(2) The present position of the U.S. in the world community on global climate change issues.

Background - The past year:

o Over the past year, our approach to the global climate change issue has been viewed as cautious in contrast to most other countries who have been publicly willing to commit to specific targets and timetables for reducing greenhouse gas emissions, regardless of cost or lack of economic uncertainties. I remain convinced that many of these countries have no idea as to how they plan to achieve their commitments or what the cost might be. We have continued to insist that we should be taking actions that are justified for other reasons (an insurance policy, if you will).

o While our approach toward any specific plans or strategies (timetables and percentages) for stabilization of CO₂ and other greenhouse gases has been factually well-justified, it has, unfortunately, been poorly-understood and our motives have been badly misconstrued. In fact, we have not called for any specific targets to date ~~because of the lack of sufficient reliable economic information available to us to craft any realistic plan.~~

o This past year, at several highly-visible, high-level meetings on climate change, such as that at Noordwijk last November, the U.S. - along with most other major powers - have signed statements, which, in principle, agree that stabilization of CO₂ emissions should be achieved as soon as possible and that "such stabilization should be achieved by..industrialized nations.. as soon as possible, at levels to be considered by the IPCC and the Second World Climate Conference of November 1990".

o By the time of the SWCC last month, the U.S. had become further isolated on the global climate change issue because just prior to the start of the Ministerial portion of the Conference, Japan, Australia and even the EC announced plans for stabilization of CO₂ emissions. The U.S. was viewed as the last hold-out among the industrialized countries not willing to propose a definite plan with timetables and percentages for the stabilization or reduction of its greenhouse emissions.

o After much skillful negotiating by the U.S. delegation at the preparatory meetings, and later, in the Ministerial meeting, all of the five major issues of concern to the U.S. (to which I referred in my memo to you of October 26), were negotiated in such a way as to favorably reflect our position on each issue. This was quite a feat given the political environment at the conference. Much credit was given to John Knauss, Administrator of the National Oceanic and Atmospheric Administration and Robert Reinstein, Deputy Assistant Secretary for Oceans and International Environmental and Scientific Affairs (Department of State), for their outstanding work at the conference.

(3) Where do we go from here?

o I am convinced that we must have a well-defined position for the U.S. to take to the table at the first negotiating session of the Climate Change Convention (which the United States will host in nearby Chantilly, Virginia in early February 1991) which will include a strategy for stabilizing or reducing greenhouse gas emissions.

o I do not believe that we can credibly state that we are waiting for the science; the IPCC science report is now out and represents the consensus of the international scientific community.

o The good news is that a number of our recent US interagency activities, many of which are being coordinated under the DPC Global Change Strategy Task Force, are in the process of developing and compiling important new information on this issue which, combined with results of analyses of benefits from actions we are already taking, such as the Clean Air Act, may soon make it possible to propose a strategy toward an economically-feasible, realistic plan regarding U.S. greenhouse gas emissions.

o The EPA and DOE, for example, have calculated that the policies that you have already put in place will enable us to hold our US greenhouse gas emissions in the year 2000 to the value they had in 1987. While others have made more extensive promises for future action, we in the US, under your leadership, have been taking specific actions. But we have failed to get this message across either to the international community or to our own environmental activists who keep insisting that we are "dragging our feet" or alleging that we are urging "research instead of action".

o To correct this notion and to help put the U.S. squarely back in a strong leadership position in the international global change arena, the members of the Global Change Strategy Task Force under the DPC are presently putting together a plan outlining how we in the U.S. will address the issue of greenhouse gas emission reduction - based upon emissions reductions achieved by present and planned Administration policies.

o We obviously have much hard work to do between now and the start of the February negotiations, but it is an important issue to us both scientifically and politically. I firmly believe that we will be able to make progress on both fronts over the next few months and that we will be in a position to present credible options to you for your decision prior to the February sessions.

90202

THE WHITE HOUSE

WASHINGTON

December 21, 1990

MEMORANDUM FOR THE PRESIDENT

FROM: D. ALLAN BROMLEY 

SUBJECT: Sea Level Rise

The NSC advised us that a sea-level rise issue was raised on your meeting with Pacific Island heads of state last month. Attached is a copy of the NASA report that was discussed in that meeting. Following is a summary of recently published scientific information on sea level rise as well as some facts on U.S. research activity related to this issue.

There are six direct and indirect causes of changes in sea level.

Sea level at any particular place in the ocean varies over time. The direct causes of these variations include vertical land motion and change in the volume of sea water. Indirect causes of changing sea level include: changes in climate, plate tectonics (such as continental drift and similar land mass shifts), ice and snow, and ocean circulation. Climate-related factors that are thought to contribute to sea-level rise include: expansion of the oceans due to temperature increases, and melting of glaciers, small ice caps, and large ice sheets (eg the Antarctic). Sea level rise also varies between different regions of the world. There are areas where sea level rise may be considerably greater than the global average and areas which are less.

Recent scientific evidence predicts some sea-level rise in the next 100 years.

National Academy of Sciences, National Research Council, Sea-Level Change, 1990

"...On the basis of estimates of global warming of the atmosphere and ocean... One hundred years from now it is likely that sea level will be 0.5 to 1 metre higher than it is at present...."

Intergovernmental Panel on Climate Change WMO/UNEP, Climate Change the IPCC Scientific Assessment, 1990

"For the IPCC business-as-usual scenario at year 2030, global, mean sea level is 8-29 cm higher than today, with a best estimate of 18 cm. At the year 2070, the rise is 21-71 cm, with a best estimate of 44 cm... Nonetheless, the implied rate of rise for the best-estimate projection corresponding to the IPCC business-as-usual scenario is about 3-6 times faster than over the last 100 years."

Some Pacific Island nations are concerned about sea-level rise.

Some Pacific Island Nations feel particularly vulnerable to the potential for sea-level rise, especially those who live on small islands with less than three metres total elevation. This concern was raised in your meeting with the heads of state and was reiterated in a speech by the Prime Minister of Tuvalu at the Second World Climate Conference two weeks ago. (Tab A)

The U.S. has a solid history of quality research programs on sea level.

Understanding and monitoring sea level is a high priority for the Administration's Global Change Research Program (USGCRP). Some of the activities of the USGCRP include: deployment of stations to measure sea level, global ice sheet observations to monitor changes by remote sensing, regional glacier monitoring, studies of atmospheric and oceanic circulation to estimate temperature change, and studying the geologic record to reconstruct the causes and histories of past changes.

The U.S. has fully participated in the international process which has been examining sea level change. The U.S. has endorsed the United Nations sponsored Intergovernmental Panel on Climate Change (IPCC) as an appropriate mechanism to consider the scientific aspects of climate change. The IPCC has three standing working groups: one on the science of global climate change, another on the impact of such change, and a third on possible responses to changes. The U.S. chairs this third group, called the Response Strategies Working Group. Through these and other programs the U.S. is continuing to work with the international community to provide sound science with which decisions can be made.

The NASA paper on monitoring global change is limited in scope.

Attached is a copy of the article to which you referred during your visit with the Pacific Island heads of state (Tab B). It discusses a recent development by U.S. government scientists, a new technique (passive microwave radiometry from satellites) which provides accurate estimates of global atmospheric temperatures.

Previously, it was believed to be impossible to maintain the calibration of satellite instruments over an extended period of time. Studies have shown otherwise, opening up the entire planet to precise temperature and other measurements, rather than just part of its land area.

The paper did conclude that there was no detectable climate change based on the last ten years of data from this new technique. However, climatologists believe that 30 to 500 years of data is required to predict any trends in climate change. While their ten-year temperature record is too short for use in any analysis of climate change, this new technique will allow relatively precise determinations of the locations and magnitudes of temperature change events in the future.

enclosures

Precise Monitoring of Global Temperature Trends from Satellites

ROY W. SPENCER AND JOHN R. CHRISTY

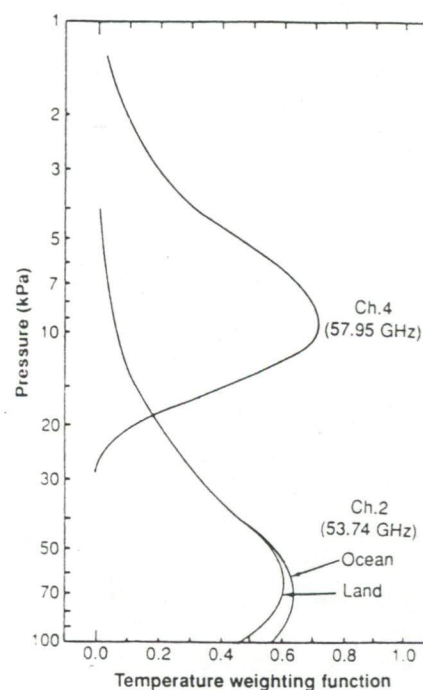
Passive microwave radiometry from satellites provides more precise atmospheric temperature information than that obtained from the relatively sparse distribution of thermometers over the earth's surface. Accurate global atmospheric temperature estimates are needed for detection of possible greenhouse warming, evaluation of computer models of climate change, and for understanding important factors in the climate system. Analysis of the first 10 years (1979 to 1988) of satellite measurements of lower atmospheric temperature changes reveals a monthly precision of 0.01°C , large temperature variability on time scales from weeks to several years, but no obvious trend for the 10-year period. The warmest years, in descending order, were 1987, 1988, 1983, and 1980. The years 1984, 1985, and 1986 were the coolest.

ACCURATE ESTIMATES OF GLOBAL ATMOSPHERIC TEMPERATURES are needed for evaluation of global climate models, detection of climate changes, and a better understanding of the climate system. Global temperatures have generally been estimated from surface temperature records, but there has been much debate regarding, for example, whether these data provide evidence of recent greenhouse warming (1). The primary source of uncertainty is the relatively sparse distribution of thermometers over the surface of the earth. Most of the earth is covered by oceans, and vast oceanic areas go unmeasured. Even over land, the coverage is greatest where the population is greatest; therefore, remote land areas also go unmeasured. An additional problem is that urban sites, which represent only a small part of the globe but where many long-term measurements have been made, have warmed because of heat from man-made structures, and thus these records are difficult to interpret (2, 3). Depending upon how the thermometer data are analyzed, various answers can be expected. In contrast to surface thermometers, sensors on satellite platforms can provide nearly complete earth coverage in as little as one day and can obtain measurements from various levels of the atmosphere. Calibration of satellite sensors is particularly difficult, however. For climate temperature monitoring a precision of 0.1°C is needed, a goal that has been perceived as difficult for any earth viewing radiometer. The difficulty arises from uncertainty about the long-term stability of satellite sensors. In this article, we show that accurate long-term global temperature measurements can be obtained from satellites

now operating and discuss data obtained from 1979 to 1988.

Methodology. In late 1978, a series of passive microwave radiometers was launched aboard the TIROS-N series of National Oceanic and Atmospheric Administration (NOAA) satellites. These radiometers, or microwave sounding units (MSUs), are Dicke-type radiometers designed to measure the thermal emission of radiation by atmospheric O_2 at four frequencies near 60 GHz (4). The atmospheric concentration of O_2 is constant in both space and time (5), and thus O_2 provides a stable temperature tracer. The strong interaction of radiation from 50 to 70 GHz with O_2 through rotational energy transitions causes absorption and emission. As the channel frequency of the MSU approaches the 60-GHz peak in the absorption complex, higher levels in the atmosphere will be measured (Fig. 1) (6). We have analyzed data from MSU channel 2 which measures the temperature of the middle troposphere at 53.7-GHz. At 57.95 GHz, MSU channel 4 can be used to monitor temperatures of the lower stratosphere. MSU channels 1 and 3 are more difficult to interpret for climate purposes because channel 1 is too sensitive to surface effects on the earth and cloud water, whereas channel 3 detects radiation from a strong temperature-transition region between the troposphere and stratosphere (the tropopause). The four channels have traditionally been used to obtain vertical profiles of temperature in remote regions of the earth where weather balloon data are not available. However, because the weighting

Fig. 1. Temperature weighting functions (unitless) for MSU channels 2 (mid-troposphere) and 4 (lower stratosphere). Also shown are the different channel 2 weighting functions for ocean and land surfaces, which arise because the less emissive ocean reflects more of the downwelling atmospheric radiation back upward. Sensitivity to the surface radiation itself cannot be implied from the magnitudes at the intersection of the curves with the surface. [Adapted from (6)]



R. W. Spencer is at Marshall Space Flight Center Huntsville, Code ES43, Huntsville, AL 35812. J. R. Christy is at Johnson Research Center, University of Alabama, Huntsville, AL 35899.

functions for each channel are vertically broad (Fig. 1), retrieval of adequate data on the vertical temperature structure of the atmosphere that are needed for computer modeling of the weather has been difficult. The temperature measurement within a constant-pressure depth, however, rather than at traditionally measured specific pressure levels, is completely adequate, even preferable in some respects, for climate monitoring.

The MSUs are externally calibrated, after each earth scan of the instrument, by measurement of the cosmic background radiation (for our purposes, constant at 2.7 K), and a warm target in the instrument that has its temperature monitored with redundant platinum resistance thermometers. This calibration design is considered to be the best available for microwave radiometers because any temperature changes in the instrument components are canceled out. The earth-viewing measurements are then calculated as a "brightness temperature" (T_b) by interpolation between these two reference extremes. The term "brightness temperature" acknowledges that the temperature measurement is actually based upon radiative brightness and is only equal to a thermometric temperature when the emitting body is completely "black" (nonreflective). This condition is nearly true of measurements of the atmosphere from MSU channel 2.

Satellite intercomparison. Because two MSUs have usually been simultaneously operating on separate satellites, a comparison between them shows how different sensors agree in their measurements and gives an estimate of errors. The NOAA-6 and NOAA-7 MSUs were simultaneously operating during a period of nearly 2 years (29 June 1981 to 16 April 1983). These satellites are in sun-synchronous, near-polar orbits, and have constant local crossing times of 7:30 a.m. and p.m. and 2:30 a.m. and p.m., respectively. The precession rates of their orbits are quite different so that in a single day there are many differences (but also many overlaps) in the areas of the globe sampled by the two satellites. The MSUs scan across the satellite subtrack, and thus paint out swaths of coverage about 2000 km wide beneath the satellites.

We averaged the channel 2 T_b data from the separate satellites at

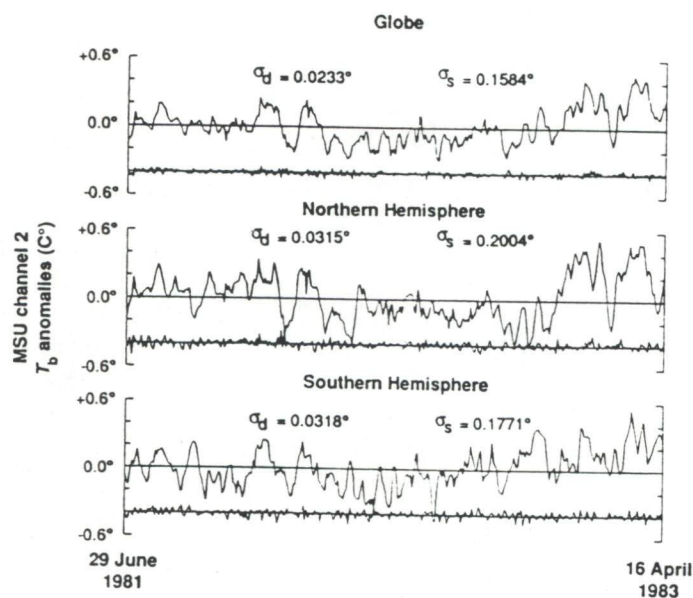


Fig. 2. Comparison between global MSU channel 2 T_b values from NOAA-6 and NOAA-7 during a nearly 2-year period (29 June 1981 to 16 April 1983) when both satellites had MSUs operating. Time series of global and hemispheric satellite averages (sum divided by 2) and differences (difference divided by 2) are shown by the large-variation and small-variation curves, respectively. The difference time series are offset -0.4°C for legibility. The SD of the two-satellite sums (σ_s) and differences (σ_d) are also listed.

2-day intervals over both the Northern and Southern hemispheres in 2.5° -latitude bands with cosine-latitude weighting to account for the decrease in surface area of these bands toward the poles. We reduced contamination of the measurements by large thunderstorm complexes, which cause infrequent depressions in T_b over small areas (6, 7), by excluding any scan lines that had individual footprint measurements that deviated by more than 1.5°C from their average relationship to both neighboring footprint measurements. The resulting variations in the 2-day averages are dominated by the seasonal change of temperature (8), termed the annual cycle. This annual cycle is sinusoidal in shape, and a smoothed cycle was computed for each satellite individually. Then this cycle was subtracted from the original 2-day time series to arrive at the anomalies in temperature, that is, the temperature deviations from the average temperature for a particular time of year. A period of data considerably longer than 2 years is necessary for a more representative annual cycle (and thus, more representative anomalies), but the short-term data are utilized only for satellite intercomparison. Several revealing observations can be made from the data (Fig. 2):

1) The standard deviation (SD) of the sums of the data from the two satellites is much larger than the SD of their differences. This relation means that both satellites were measuring nearly the same temperature variations and implies that hemispheric temperature anomalies can be measured with relatively little error from a single satellite. The 2-day average difference between these satellites was about 0.05°C , and for monthly averages, the difference improved to about 0.011°C . Similar noise was found in monthly comparisons between data acquired from sensors on (i) TIROS-N and NOAA-6 (0.012°C), (ii) NOAA-7 and NOAA-9 (0.012°C), (iii) NOAA-9 and NOAA-10 (0.006°C), and (iv) NOAA-10 and NOAA-11 (0.008°C), although much shorter overlap periods were available. Thus, we estimate that the precision of monthly satellite measure-

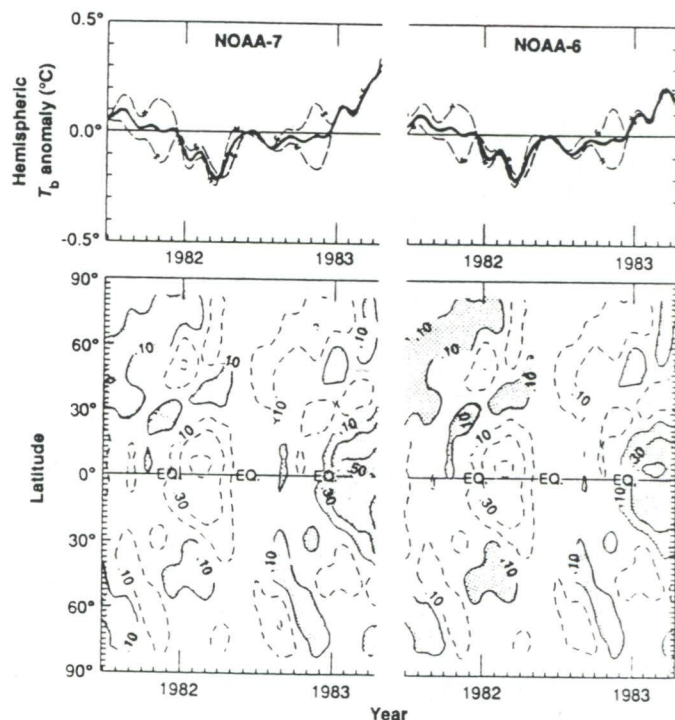


Fig. 3. Low-pass filtered hemispheric (top) and zonally averaged (bottom) MSU channel 2 T_b anomalies during the 2-year overlap period of NOAA-6 (right) and NOAA-7 (left); "N" and "S" labels represent Northern and Southern hemispheres, respectively, and the global time series is the heavy line. The time series do not agree near the beginning and end of the period because of the low-pass filter and the lack of data past the end of the period for NOAA-6 or before the beginning of the period for NOAA-7. Warm zonally averaged anomalies are stippled.

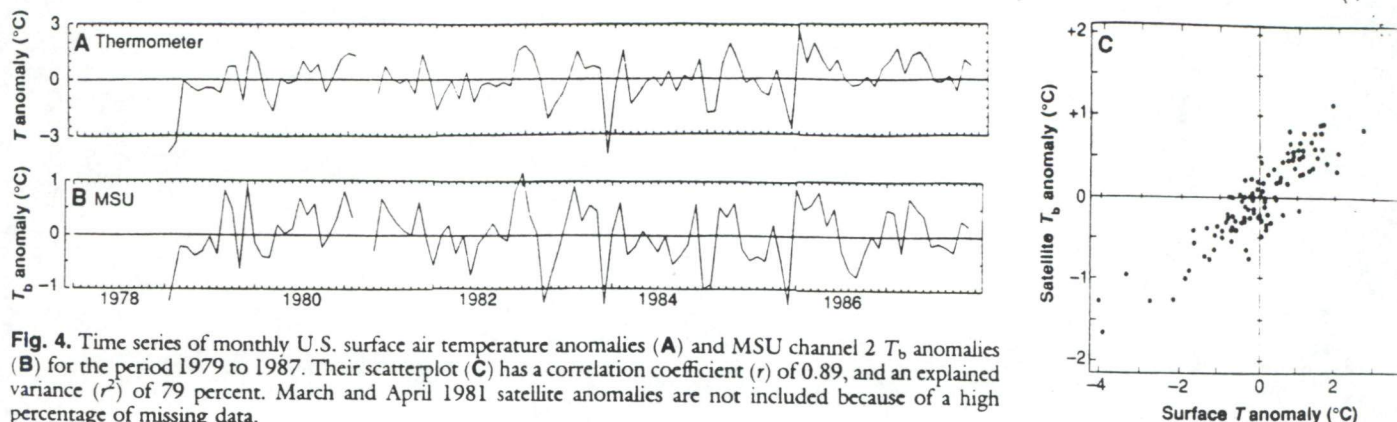


Fig. 4. Time series of monthly U.S. surface air temperature anomalies (A) and MSU channel 2 T_b anomalies (B) for the period 1979 to 1987. Their scatterplot (C) has a correlation coefficient (r) of 0.89, and an explained variance (r^2) of 79 percent. March and April 1981 satellite anomalies are not included because of a high percentage of missing data.

ments is about $\pm 0.01^{\circ}\text{C}$ for the globe.

2) The sums of the two sets of data reveal that dramatic globally averaged warming and cooling events of greater than 0.5°C can occur in less than 2 weeks. The warmings, representing huge energy exchanges, are possibly associated with stormy periods when large amounts of latent heat were released in precipitation of moisture previously evaporated from the sun-warmed ocean. The coolings might be from formation of widespread low-level cloudiness, which reflects significant amounts of incoming solar radiation.

3) The long-term drift of one instrument relative to the other, seen in the difference time series in Fig. 2, is so small that it is virtually unmeasurable. Any trend is less than $\pm 0.01^{\circ}\text{C}$ for the 2-year period. This high degree of stability was unexpected. The four other satellite overlaps mentioned above also gave no indication of drift.

Further evidence that the measurements were repeatable is shown by low-pass filtered (9) time series of hemispheric (and global) temperature anomalies from NOAA-7 and NOAA-6 data and the zonally averaged distribution of those anomalies (Fig. 3). The zonal averages allow examination of which latitude bands of the earth were responsible for the warm or cool events seen in the hemispheric and global time series. The zonal average patterns are nearly identical between satellites. Such agreement improves our confidence that even regional areas can be studied to find the origins of the hemispheric anomalies.

Comparisons with United States and global thermometer measurements. Although the above results indicate that the sampling provided by a single satellite is geographically extensive and that the measurements are radiometrically stable enough to be useful for monitoring climate, it still must be demonstrated that MSU measurements are closely related to temperature. Earlier investiga-

tors have made point comparisons between weather balloon data and satellite measurements (10–12). The differences between individual radiosonde and satellite measurements are generally less than 1.0°C . These differences are usually attributed to (i) the isolated balloon sampling compared to the large area represented by a single satellite measurement (a circular footprint 110 km in diameter); (ii) errors in calibration of the balloon thermometer before its release; (iii) the random noise of a single MSU measurement, about 0.3°C ; and (iv) time mismatches between the satellite and balloon observations. We compared the 1980 through 1988 MSU observations to T_b data obtained from radiosondes launched twice daily by 60 National Weather Service offices around the United States. The T_b data were calculated with the radiative transfer equation for MSU channel 2, and thus the radiosondes had to reach a fairly high-pressure altitude, 2 kPa or less. Only MSU data within 200 km of the radiosonde location and within 3 hours of its release time were included. The comparisons revealed that there were biases of up to $\pm 1^{\circ}\text{C}$ between the two data sets; the biases are most easily related to the difference in time between the release time of the radiosondes (all simultaneous at 00 and 12 GMT) and the MSU observation times, which are sun synchronous. After correction for these biases on a station-by-station basis, we found no long-term trend in the 9 years of differences between MSU and radiosonde-calculated T_b values and a monthly SD of 0.068°C .

The MSU data also can be compared to records of temperature variability from near-surface thermometers. Even though they are different variables, their common variability helps to assess how well coupled the near-surface temperature variations are to the deep layer variations. Although the global distribution of thermometers is suspected by many researchers as being inadequate for accurate monitoring, the distribution over the United States is widely

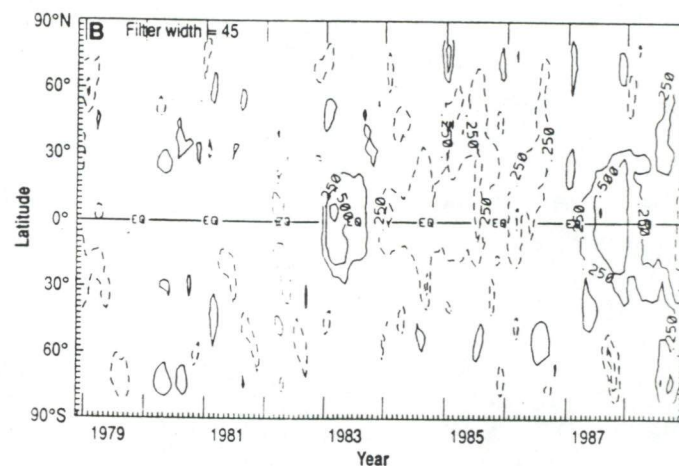
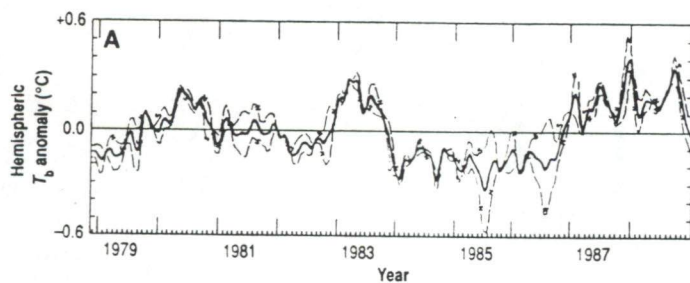


Fig. 5. Hemispheric anomalies (A) and zonally averaged anomalies (B) about the average annual cycle of MSU channel 2 T_b values for the 10-year period 1979 through 1988; "S" and "N" refer to Southern and Northern hemispheres, respectively; the global time series is in a heavy line. Zonal anomalies are contoured every 0.25° ; positive anomalies (warm) are solid and negative ones (cool) are dashed.

accepted as good enough for climate work. We compared monthly temperature anomalies from thermometers over the contiguous United States for the period 1979 through 1987 (13) to our monthly mid-tropospheric temperature anomalies from the satellites. The resulting anomaly time series (Fig. 4, A and B) are similar, as verified by a scatterplot (Fig. 4B) and a correlation coefficient of 0.89. This correlation agrees with those between radiosonde near-surface and upper air measurements, for which monthly temperature anomalies range from 0.8 for the eastern United States to greater than 0.9 for the western United States. The surface anomalies are typically two to three times as great as the MSU anomalies. This relation is probably a result of daytime solar heating and nighttime cooling of the surface, which largely control the deeper air mass temperatures over the United States on monthly and seasonal time scales.

Two major research groups have been responsible for hemispheric calculations of temperature anomalies from thermometer measurements, and we refer to them by their leading authors names: Jones (14, 15, 16) and Hansen (17). Their results have been sufficiently different to spark debate in the climate community and have led to conflicting reports in the popular press regarding global temperature trends. We have compared our satellite-measured hemispheric anomalies to the thermometer-based anomalies from these two groups (Table 1). Again, when the separate systems are viewed as a bivariate distribution in which we wish to determine the level of common variability, these comparisons reveal that the level of

agreement between the calculations by Jones and the satellite data is about 40% better than that between the calculations by Hansen and the satellite data. As might be expected for two land-dominated data sets, the Jones and Hansen data are much better correlated with each other, with an explained variance of 94%, than either is with the MSU data. The much lower explained variances for the hemispheres and globe (Table 1) compared to the United States are the result of both poor thermometer coverage over much of the earth and weak thermal coupling between the middle and lower troposphere over much of the oceans. This latter effect was deduced from radiosonde near-surface and deep layer temperature comparisons: When monthly surface temperature anomalies from radiosonde are compared to the corresponding radiosonde-calculated channel 2 anomalies for United States-controlled ocean stations, the explained variances drops to about 35% for the Caribbean, 0 to 20% for the tropical Pacific, and 25% for the tropical south Atlantic. Although there are few high-latitude ocean radiosonde stations, the data suggest that the thermal coupling increases poleward (for example, 52% in Iceland), probably because of the wider range of air mass temperatures encountered there. Thus we would not expect as good agreement between MSU anomalies and tropical ocean surface air temperature anomalies as are obtained over land, even if the oceanic thermometer coverage were adequate. This conclusion is substantiated by the somewhat poorer agreement between the satellite data and combined thermometer and sea surface temperature data from

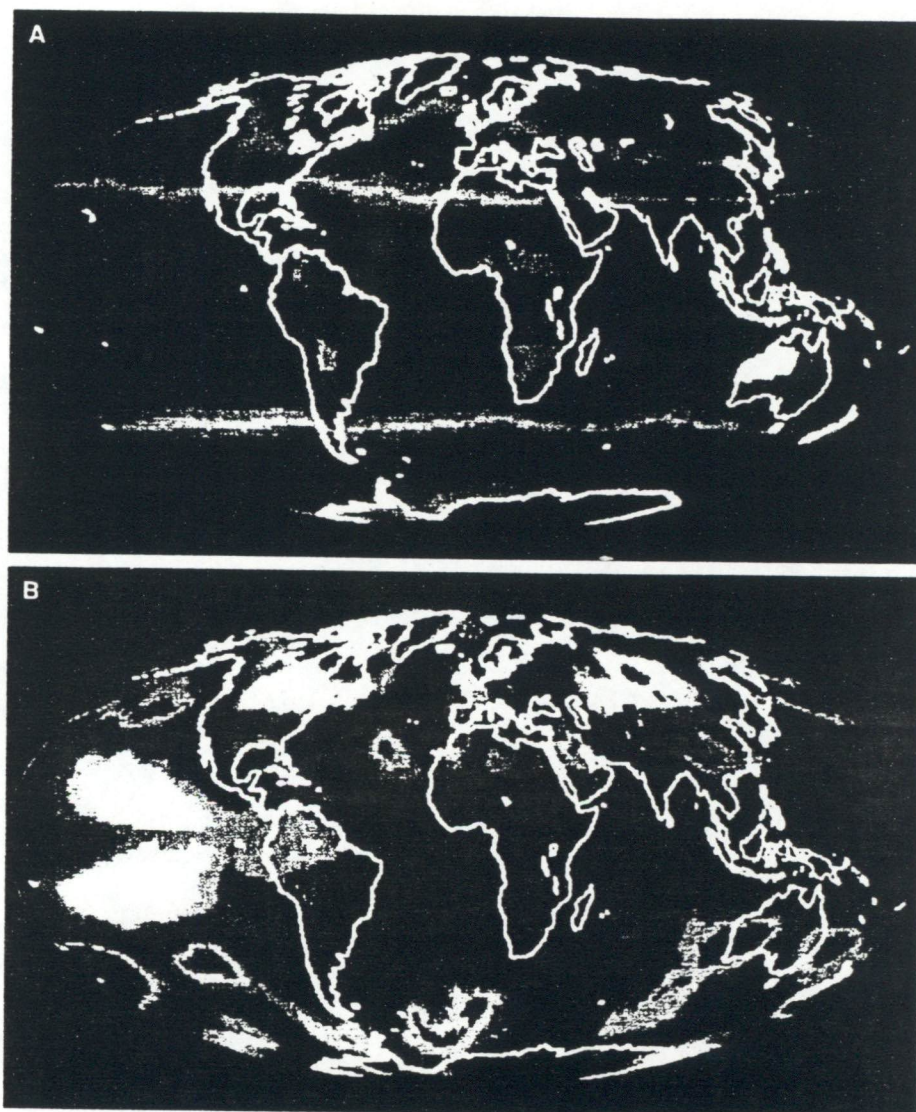


Fig. 6. Average MSU channel 2 T_b (A) during the 10-day period 26 January to 5 February and temperature anomalies (B) for the same 10-day period during the 1983 ENSO climate anomaly. Temperatures range in top image is gray, representing 235 K, to red, representing 260 K, in 1 K increments; temperature anomalies in bottom image change color every 0.25 K, the blue side of dark gray is colder, red side is warmer.

Table 1. Monthly and annual explained variances (in percent) between MSU and thermometer-measured temperature anomalies for United States (U.S.), Northern (NH) and Southern (SH) hemispheres, and the globe from 1979 to 1988. Thermometer-based calculations for the United States are from Karl (13); monthly and annual hemispheric and global thermometer anomalies are from Jones (14-16); annual anomalies are from Hansen and Lebedeff (17), and hemispheric and global anomalies, which also include sea surface temperatures, are from Farmer *et al.* (18).

Source	U.S.	NH	SH	Globe
<i>Monthly</i>				
Karl	77			
Jones		33	10	35
Farmer		26	11	28
<i>Annual</i>				
Karl	77			
Hansen		67	27	53
Jones		72	66	74
Farmer		77	24	69

Farmer *et al.* (18) (Table 1). The poor agreement raises the important issue of whether near-surface temperatures or deep layer temperatures should be monitored for detection of climate change. Because they are often different from one another over the tropical oceans, it would be best to monitor both in order to gain an understanding of how the entire troposphere behaves. Indeed, it might well be that the oceanic surface air layer is so strongly coupled to sea surface temperature variations that a deep layer mean would provide an earlier signal of possible greenhouse warming.

Global temperature anomalies 1979 to 1988. The first 10 years of satellite data reveal large fluctuations in the hemispheric and global temperatures (Fig. 5A). The Northern and Southern hemispheres trends follow each other for the slower, interannual trends, but often oppose each other on monthly to seasonal time scales. The warmest years, in decreasing order, were 1987, 1988, 1983, and 1980. There is no obvious long-term trend, and anomalies during the first 5 years nearly balance those during the last 5 years. The 1988 warm event was traced to the mid-latitudes, as was the 1980 warm anomaly. Both years included summer heat waves in the United States. The largest warm anomaly in the Northern Hemisphere for the 10-year record occurred in 1987 and 1988 (Fig. 5B). The 1987 and 1983 warm events were associated with El Niño/Southern Oscillation events [ENSOs (19)]. During the 1983 ENSO, transfer of heat from record-setting sea surface temperatures in the eastern Pacific to the atmosphere caused major changes in atmospheric flow that impacted weather conditions worldwide. Warming locally exceeded 2°C in two Pacific anticyclones (Fig. 6) that straddled an equatorial zone of intense convective activity caused by the warm water. This event caused globally averaged temperatures to rise more in several months than what is expected within several decades if enhanced greenhouse warming is occurring. Although the 1987 ENSO has been considered weaker than the 1983 ENSO, it was associated with higher temperatures that were more uniformly spread throughout the tropics. The mid-latitudes in both the Southern and Northern hemispheres in 1988 experienced warm conditions that appear to be coupled to the 1987 tropical warmth. The period 1984 to 1986 was dominated by cooler than normal tropical air. The 10-year time series exhibits bifurcation in that there are nine cool or warm years, and only one year (1981)

that could be considered "average." This pattern makes the definition of what is "normal" for global temperatures uncertain, for a shown above normal can mean either warm or cool conditions.

The future. Our data suggest that high-precision atmospheric temperature monitoring is possible from satellite microwave radiometers. Because of their demonstrated stability and the global coverage they provide, these radiometers should be made the standard for the monitoring of global atmospheric temperature anomalies since 1979. Their use will allow relatively precise monthly determinations of the locations and magnitudes of temperature change events. The resulting data should provide a greater focus of scientific debate on why temperature anomalies occur rather than whether they occur. The advanced microwave sounding unit (AMSU) will replace the MSU on NOAA satellites in the mid 1990s, and these units will allow extension of the time series into the next century. Various computerized climate models, which predict future changes through time-dependent equations representing physical processes, can now be evaluated with accurate global temperature measurements. These data should result in improved specification of processes in these models, which still require independent verification. These improvements should facilitate more informed policy decisions concerning the effects of anthropogenic greenhouse gas production.

REFERENCES AND NOTES

1. R. A. Kerr, *Science* **246**, 1118 (1989).
2. R. C. Balling and S. B. Idso, *J. Geophys. Res.* **94**, 3359 (1989).
3. T. R. Karl, H. E. Diaz, G. Kukla, *J. Climate* **1**, 1099 (1988).
4. M. L. Meeks and A. E. Lilley, *J. Geophys. Res.* **68**, 1683 (1963).
5. L. Machta and E. Hughes, *Science* **168**, 1582 (1970).
6. N. C. Grody, *J. Climate Appl. Meteorol.* **22**, 609 (1983).
7. R. W. Spencer, H. M. Goodman, R. E. Hood, *J. Atmos. Ocean. Tech.* **6**, 254 (1989).
8. Other, smaller signals are also present in the measurements. These include a small surface temperature contribution (8 percent of the total over land, 4 percent over the ocean), wind-induced roughening of the ocean surface, cloud liquid water effects, water vapor variations, sea surface temperature changes, and soil moisture changes. The effects of variations in each of these parameters on the measured T_b values have been theoretically evaluated, and have been determined to be small for MSU channel 2 (0.01°C or less) on a hemispheric and global basis. Larger effects could conceivably occur over small regions. In contrast, MSU channel 4 is essentially unaffected by any of these changes. The radiative transfer theory involved in the analysis of these effects is covered in (6).
9. Low-pass filtering of the time series allows isolation of the more slowly varying temperature variations that are of interest to climatologists. Here, the filter retains 50 percent of the power of cycles having 90-day periods, progressively less power of periods shorter than 90 days, and more power of longer periods.
10. N. C. Grody, *Remote Sensing of the Atmosphere and Oceans*, A Deepak, Ed. (Academic Press, New York, 1980).
11. ——— and W. C. Shen, *NOAA Tech. Rep. NESS 88* (1982).
12. E. R. Westwater, Z. Wang, N. C. Grody, L. M. McMillin, *J. Atmos. Oceanic Tech.* **2**, 97 (1985).
13. T. Karl, unpublished data.
14. P. D. Jones *et al.*, *J. Climate Appl. Meteorol.* **25**, 161 (1986).
15. P. D. Jones, S. C. B. Raper, T. M. L. Wigley, *ibid.*, p. 1213.
16. P. D. Jones, *J. Climate* **1**, 654 (1988).
17. J. Hansen and S. Lebedeff, *J. Geophys. Res.* **92**, 13,345 (1987).
18. G. Farmer, T. M. L. Quigley, P. D. Jones, M. Salmon, *Documenting and Explaining Recent Global Mean Temperature Changes* (Climatic Research Unit, University of East Anglia, Norwich, 1989).
19. R. S. Quiroz, *Mon. Weather Rev.* **111**, 1685 (1983).
20. R. Jenne and D. Joseph provided the MSU data used in this study; R. Hood provided data processing and programming support; N. Grody collaborated on portions of this research and provided general advice; F. Wentz provided updated sea surface emissivity estimates; P. Olsen, F. Soltis, and P. Swanson assisted us in obtaining technical data on the MSU; G. Wilson helped obtain the satellite data sets; discussions with J. Dodge and R. McNider led to the present research.

27 October 1989; accepted 23 February 1990

CHECK AGAINST DELIVERY

Address
by the
Prime Minister of Tuvalu
Rt Hon. Bikenibeu Paeniu
to the
Second World Climate Conference

Geneva
6, November 1990

I am most honoured and privileged to be amongst the main key speakers this morning.

I congratulate the World Meteorological Organisation (WMO) and the United Nations Environmental Programme (UNEP) and all those who have worked hard to ensure the holding of this most important Conference.

I must say it is quite a daunting experience to address a collection, or should I say a cluster of most eminent scientists, experts, researchers, diplomats and policy makers today on the subject of climate.

When I was asked to take part in this Conference, I was comforted by the very fact that I could speak with my heart on the matter. I can assure each and everyone of you that I speak to you today from real experience because I live on one of the most smallest island groups in the Pacific. We are therefore, along with others, extremely vulnerable to environmental hazards and the dangers of the Greenhouse Effect and sea level rise. These are problems which we have done the least to create but now threaten the very heart of our existence.

We in the Pacific, the Carribean and elsewhere had done the least to create these hazards but now stand the most to lose.

My colleagues who have eloquently spoken before me are prominent leaders from some of the leading nations of our world. From the onset, I want to express my gratitude for their important remarks and their concern for climate change. Despite the smallness of my country, and of others, we are all here gathered to address a paramount global challenge. Climate change will affect all of us.

However, because of our vulnerability and high susceptibility to climate changes, we would be affected proportionally more than many of the countries represented here today.

I am very confident that not only do I speak for my country, but also I speak for my neighbouring countries in the Pacific and as well as others, especially those from the Southern Hemisphere.

I sincerely hope I will be able to share with you this morning a somewhat different but interesting perspective on the problem of climatic change.

Why Tuvalu is particularly susceptible to Climatic Changes

As some of you may not know, my country has a total land area of only 24.4 square kilometres - only a speck on the maps of the world. This 24.4 square kilometres is further divided among nine islands, ranging in size from Vaitupu which is 4.9 sq.km to Niulakita of only 0.4 sq.km. All our nine islands are low lying coral atolls dispersed over an area of 1.2 million square kilometres of the South Pacific Ocean, none rising more than 2 metres above sea level.

In sharing a number of thoughts with you today, I want to tell you the reality of life in Tuvalu in terms of the impact on our lives of the global climatic changes so far. My country is amongst the most vulnerable to climate and sea level rise in the world. The survival of Tuvalu and the survival of other neighbouring countries in the South Pacific - Kiribati, Tokelau, Tonga, Marshall Islands and so forth - hang in the balance. This eminent gathering therefore could make the difference between Tuvalu's imminent demise and its continued existence.

The scientists have confirmed that global warming is now a certainty. The findings of the international scientific community finalised in Sweden this year, have now been confirmed by the experts gathered here last week. We have learned of the best Scientific and Technical estimates assuming "business as usual" for greenhouse gas emissions which are:

An average rate of increase of global mean temperature during the next century of about 0.3 de C per decade (uncertainty range of 0.2 to 0.5 deg C).

An average rate of global mean sea level rise of about 6 cm per decade (uncertainty range of 3-10 cm per decade).

Now it is up to the decision makers of the world, particularly those of the leading industrialised nations, to respond with decisiveness and conviction. We know from all the scientific evidence collected to date that the fragile and delicate atmospheric balance on which life and our existence depends has been upset. The threat to the atmosphere comes predominantly from the breath of industrialised civilisation.

We in the island nations cannot afford to wait for more studies and research. We would like to have firm and pragmatic solutions to curb the negative impact of climatic changes on our lives.

We live on these small fragile islands and we know that the problems are now and not tomorrow. The time to act is now or never.

Tuvalu needs help to face up to this challenge. In

As we in the Pacific Island region enter the 1990's, we increasingly face a range of environmental problems far more extensive and more serious than ever before. Problems of ozone depletion, climate change, sea level rise, hazardous waste dumping, driftnet fishing - to name some which fall into this category. These impinge severely on the development process itself of our countries in the Pacific and the overall impact has been, and will continue to be, unfavourable.

Already we in Tuvalu have been experiencing the adverse effects of global warming and the greenhouse effects. I am happy to share with you some of the most salient features.

a. Frequency of Tropical Cyclones

In 1940 there were 2 cyclones, but over the last fifty years the number has risen dramatically - a ten-fold rise to 8 in 1960, 18 in 1980 and 21 so far in 1990. These storms have seriously caused erosion to the already extremely limited amount of land we possess. This in turn bears an impact on population growth and pressure on other resources.

Cyclones have also devastated many of our crops and trees. The loss of trees can cause the interruption of the nutrient cycle above and below the soil. The soil loses fertility, plants and animals lose their habitats, and our food and water supplies and our healthy air is also seriously affected.

b. The Water Table

We have not yet installed measuring instruments to test the rise in sea level but we have noted increased salinity in ground water supplies, attesting to intrusion of sea water into the water table. This increased salinity impacts unfavourably on both the supply of drinking water as well as efforts to grow things, - agriculture being already difficult due to harsh soils.

c. Temperature Changes and Rainfall levels

Despite the rise in the number of cyclones, Tuvalu has been experiencing an increasing number of dry spells, with average annual rainfall declining from 420 millimetres per annum at December 1980 to 300 millimetres at December 1988 - a drop of 28.6% in the eight year period. Simultaneously, average daily temperatures have risen by 0.5 degree celsius over the last thirty years.

In light of all the above we entreat this Conference to propose measures which promote urgent and pragmatic actions, rather than having this gathering end up as

Action Being Taken by Tuvalu to Prevent/Mitigate Adverse Climatic Changes

a. Energy

Less than 50% of our total population of 8,309 people have access to electricity but 1.8% of household energy consumption is solar generated. We intend to increase this proportion to 3% by 1993. All electricity in the outer-islands is solar generated.

b. Agriculture

We have embarked on a modest re-afforestation programme whereby, between 1970 and 1987 some 115.3 hectares of land was replanted with coconut trees. Early in 1991 we intend to begin a new tree planting exercise, including coconuts, mangoes and citrus. As a further measure, farmers are actively encouraged to inter-crop coconuts with root crops. Again we consciously utilize natural manure instead of chemical fertilizers and promote biological pest control rather than dangerous pesticides in our agricultural practices.

Assistance Tuvalu Needs to Promote a Healthy Environment

We recognise that much more can and needs to be done. For instance we currently use borrow pits dug out by the U.S. Army during the Second World War to help in the construction of an airfield - to dump our garbage, because of limited land space.

We know there are more environmentally friendly methods of solid waste management, but due to financial and other constraints we cannot access them.

Already the EEC is providing funding in the areas of coastal reclamation and solar energy, while the Australian Government has promised to supply us with equipment to test the rise in sea level. But there has been a rather slow response from donors to our request for rehabilitation assistance for damage caused by the most recent Cyclone Ofa - which occurred in February of this year.

Therefore we urge the developed countries to come to our assistance in designing and implementing a comprehensive environmental strategy. We need assistance in the training of a number of national experts in environment and climatic changes as well as the strengthening of our national capabilities to monitor onsite climatic changes and sea level rise.

Regional and Global Perspective

On a regional perspective, the Pacific Island governments have demonstrated unity on environmental issues where we have perceived outside activities likely to cause damage to the environment and threaten our small islands and fragile ecosystems.

Our opposition to these abuses by others of our environment has led to our undertaking collaborative efforts in a number of areas.

In particular, I refer to the South Pacific Nuclear Free Zone Treaty, the Convention for the Protection of the Environment and Natural Resources of the South Pacific Region which recently came into force, our actions on Driftnet Fishing and our collaboration through the South Pacific Regional Environmental Programme.

We welcome and encourage the participation of other governments in these important areas where our small island countries have already joined together with some of our larger neighbours to protect our common heritage.

Some of our developed partners present here today may be asking themselves what they can do to help countries like Tuvalu withstand this problem. At a Summit between leaders of the South Pacific sovereign nations with President Bush, held at Hawaii on 27 October, the environment and climatic changes were amongst the contentious issues discussed. At one point, President Bush asked - "What can we, the United States do in order to help countries in the South Pacific?" I replied immediately - "Mr President, can I answer that question?" He looked at me and said - "Go ahead". Then I said - "Well, the United States could help countries like Tuvalu in building coastal protection schemes such as those the FEC are already providing us with though we would need more assistance in this area; we would need to build more water catchments. I went on saying: "I am pretty sure I shall be the only Head of a South Pacific Government that will be present at the forthcoming Second World Climatic Conference in Geneva early next month. At that Conference, Ministers will deliberate on Ministerial Declaration which will, inter alia, include provisions for developed countries to cut down their emission rates of greenhouse gases; for developed countries to provide the necessary resources to developing countries to help them establish the required measures and infrastructures which will lessen the impact of the Greenhouse effect." Then I said, "Mr President, I look forward to the support of the United States on this Ministerial Declaration".

On the same token, and in anticipation of a similar question from our developed partners present here today, I will add the following:

- Provide assistance at the regional level to help us strengthen the South Pacific Regional Environmental Programme
- Help us train our nationals in the areas of environment and climatic changes
- Help us to strengthen both at the national and regional levels our capabilities of monitoring and detecting cyclones and other natural disasters in order to allow us prepare in advance
- Help countries in the South Pacific establish a pragmatic and reliable Disaster Preparedness and Rehabilitation Programme.

Ministerial Declaration

I support the Draft Ministerial Declaration presented to us by our experts merely because I consider it a start of an imperative process towards a Framework Convention on Climate. I must admit however that I am not happy with the commitments made by a number of the industrialised countries which has resulted in a weak Declaration. It appears that science has been ignored by a number of decision makers. I would be content if such stance is done on goodwill. But if science is being deliberately ignored, then I will regard such an attitude as one of total selfishness, and inhuman.

The problem we are addressing right now is of a global nature. We need the cooperation and support of all nations in this world. We in Tuvalu, and this goes as well for our sister countries in the Pacific, the Indian Ocean and the Caribbean, contribute little or nothing to the problem and yet we will be the first to suffer. Our survival is at stake.

I may come from a poor and small nation but the fact of life is that my country and its people in particular are a distinct race of our earth planet. Like yourselves, we are citizens of the world - our world. We have our own language and culture. We have a God given right to live on earth. We may be small but we have a spot there to maintain in our biosphere. We contribute to the diversity and balance of the earth's ecosystem. It will therefore be an injustice should we in Tuvalu and the island nations, be denied our right to live in our homeland.

The nations of the developed world carry an enormous burden of responsibility. The problem is clear and the options for action are clear. This Conference therefore presents a clear opportunity for effective and speedy action. These countries which have been contributing to the accumulation of greenhouse gases for so long continue to pollute our atmosphere. I say this with no sense of criticism for past actions - indeed the world has only in the past few years realised the problem. At times I feel that this is a

of telling us, human beings, to be more responsible in the maintenance of the earth's balanced ecosystem. Afterall the earth was not created by a human being. And if we do not respond positively to the challenge, then I feel the catastrophe will take place as predicted by science. Such is not at all fair to Tuvalu.

My bigger neighbours in the Pacific - Australia and New Zealand - have been quick to act with decisive national policies. However, the effects of their efforts will not be enough on the global scene. It is up to the large industrialised economies of the world to respond to the clear challenge. Let us all bind ourselves together and pragmatically solve the problem as responsible citizens - brothers and sisters - of the world. We will surely bring about peace and prosperity to all if we join together in addressing the problem.

TABLE 2

EMISSIONS REDUCTIONS EXPECTED IN THE YEAR 2000
DUE TO CURRENT ENVIRONMENTAL COMMITMENTS
AND OTHER INITIATIVES ASSUMED IN THE ANALYSIS

<u>CURRENT COMMITMENTS</u>	<u>MILLIONS OF TONNES REDUCED (Carbon Equivalents) 2000⁴</u>
o TREE INITIATIVE	~9
o DOE ENERGY EFFICIENCY INITIATIVES	28
o DOE APPLIANCE STANDARDS	4
o DOE RENEWABLE INITIATIVES	4
o CLEAN AIR ACT	17
o LANDFILL REGULATION	44
o CFC PHASEOUT & MONTREAL PROTOCOL	551

⁴ Assumes a 100 year time horizon in GWP calculations.

another academic endeavour.



