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THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release April 23, 1990

REMARKS BY THE PRESIDENT
TO THE NATIONAL ACADEMY OF SCIENCES

National Academy of Sciences Headquarters Building
Washington, D.C.

2:09 P.M. EDT

THE PRESIDENT: Apologies for being late. To the distinguished members of the National Academy -- all. And to Dr. Press and Dr. Ebert, Dr. Raven, Dr. Gordon, Dr. Blout. Now we start on our side -- Dr. Bromley. (Laughter.) Jim Watkins, a member of our Cabinet. Admiral Truly, ladies and gentlemen: it really is an honor to be with you today.

We stand at a very interesting time. And the advice and council of this academy has been really crucial to American presidents for well over a century. And I'm proud to be the latest to come over here to say thank you. We also stand at a moment of wondrous prosperity. But our wealth goes far beyond the merely material. Ours is an intellectual prosperity, unprecedented in history. For that and the health and security it affords this nation and the world, gratitude is owed to the men and women who have committed their minds and lives to science.

Those devoted to such work -- its patient searching, its passionate struggles -- have engaged themselves in mankind's most exalted mission and the mind's manifest destiny: the search for understanding. That's what it all boils down to.

President Lincoln established this great institution in the dark hours of our nation's greatest crisis -- which testifies to the enduring importance of scientific knowledge. In the years that followed, your academy has responded to urgent national needs in times of war and peace.

When this magnificent building was dedicated, Calvin Coolidge predicted "a new day in scientific research. A new sun is rising," he said. He was right. The awesome scientific advances of this century, many of which you've brought about, bring us ever closer to the understanding that's required of the universe, its origins, and our own. And science has told us a stranger and more wondrous story than myth might ever have written for us.

Fourscore and 10 or 20 billion years ago, the theory goes, it all began -- with a universe of energy and mass unimaginably hot and compressed, containing everything that would become what we now see in the heavens. And then, science tells us, in one incomprehensively powerful instant, energy and matter of every kind exploded in every direction. Or as a layman might explain it, somebody hit that cosmic baseball right out of the park. (Laughter.)

But while the pace of cosmic change may have begin with blinding speed and slowed down since, the pace of our scientific evolution has been rapidly accelerating. Growing in intensity like a series of chain reactions in a critical mass of highly-trained American grey matter -- touching off scientific and technical revolutions in every direction.

Today, I wanted to come over here to outline the role that this administration is playing to advance those revolutions. Because as the pace of science accelerates, I believe that government must keep pace -- and will keep pace.

MORE

First, we've moved to better integrate science and technology into the policy process. We've created an interagency working group that will more closely link science and technology -- link their considerations with the policy-making process of the Economic and Domestic Policy Councils.

My Assistant for Science and Technology, Dr. Bromley, chairs this working group and participates in those councils, advising them on matters related to science and technology, as well as serving on the National Space Council.

And we're also committed to greater cross-fertilization with talent from the private sector, on issues ranging from pure research to manufacturing performance. So this year we created a President's Council of Advisors on Science and Technology -- experts whose guidance I value and depend on. I've already had two meetings with that group, myself. We'll also be looking for counsel from this academy's new manufacturing forum, just announced this month.

We want to advance America's tradition of innovation, and we intend to get the biggest bang for the federal buck. And this administration has also taken steps to reinvigorate the Federal Coordinating Council for Science, Engineering and Technology, in order to assure that the federal investments in R&D programs are closely integrated across these agency boundaries.

In January, we sent a budget to Congres that includes a record $71 billion for research and development; an investment in a stronger economy, a more secure nation and, indeed, a brighter future. Our administration is committed to investing in the future; it's evident in the policies we're creating and the budget we're calling for, with everything from a 24-percent increase for NASA, to our support of a major agricultural research initiative.

To improve the international competitiveness of American industry and our overall standard of living, we've called for a permanent extension of the research and experimentation tax credit. And we're working to lower the cost of capital and clear away regulatory burdens so that industry can make the kinds of investment that the future demands.

Along with the applied, market-driven knowledge so crucial to this country's competitive future, let me reaffirm two other priorities:

First -- and I'm going to keep talking about this one -- math and science education. We understand that only with a new generation of scientists and engineers will your work and America's preeminence be assured. And so we're engaged in a broad initiative of reform and restructuring in cooperation with the states. It's an effort that began with our first-ever education summit with the nation's governors last fall. And our goal is to make American students first in the world in science and math achievement by the end of this century, and to convince more women and minorities to study science.

We're providing a number of new incentives for students, like the National Science Scholars Program that I've proposed. We're opening the doors of federal laboratories, facilities, and agencies to students and teachers. Our budget increases funding by 26 percent to over $1 billion for science, math, and engineering education, through the Departments of Education, Energy, Interior and others, as well as the National Science Foundation and NASA.

And today, I ask our industrial and business communities to create new alliances for education, mobilizing more of this nation's great technical resources for the sake of the future. We are committed to ensuring that America has the brainpower to remain at the forefront.

A second priority of this administration is basic

research -- the historical wellspring of this nation's well-being. Science must be able to continue seeking answers to our most fundamental questions.

For such reasons our budget calls for increasing funding for the U.S. Global Change Research Program by 57 percent, to over $1 billion. And earlier this year, I reiterated my commitment to double the National Science Foundation budget by 1993. Today, I want to call on Congress - put our money where our future is. Put an increased National Science Foundation budget back on track.

Today, science and technology are assuming a broader and more interrelated role in human life than ever before. And they're becoming forces for historical change.

Satellites already help us study the Earth's natural systems and assess environmental threats. And the mission to Planet Earth will further our work of global stewardship.

But this past year, in the Revolution of '89, we've also seen communication satellites, along with video cameras and VCRs and FAX machines, becoming a potent force for peace -- both a product of science and a source of conscience -- bringing the actions of nations before the eyes of the world.

Pictures from Poland and South Africa, scenes on the Berlin Wall -- the eye of technology has proved more powerful than chisels for breaking down barriers, etching the idea of freedom on the psyche of humanity, and setting off a wondrous, hopeful, political chain reaction worldwide.

It's no accident that many of the individuals at the center of today's worldwide political revolutions share a vision of the future based on personal freedom, openness, and freedom of inquiry. These values are shared by our political system and by science alike. Science, like any field of endeavor, relies on freedom of inquiry. And one of the hallmarks of that freedom is objectivity.

Now more than ever -- on issues ranging from climate change to AIDS research, to genetic engineering, to food additives -- government relies on the impartial perspective of science for guidance. And as the frontiers of knowledge are increasingly distant from the understanding of the many, it is ever more important that we can turn to the few for sound, straightforward advice.

The National Academy of Sciences is renowned for objectivity and immunity to partisan pressures. Your impartial guidance has been invaluable to American presidents and to the American people for well over a century. So I am confident that the members of this body, the most distinguished scientists in America, will continue the tradition that has been the Academy's hallmark.

On this I know we agree, because so many of our technical and scientific achievemens have been the products of independent minds. And if the Earth-moving events of 1989 reminded us of anything at all, it's that complex bureaucracies and centralized planning don't work well in the governance of societies. We will not try to impose them on science.

Just as entrepreneurs and small businesses fuel the growth of the American economy, the backbone of American science is its brilliant array of individual investigators spread across the nation.

Among so many, think of Chester Carlson, who invented the photocopy machine in a little room over a Long Island pub. Or Barbara McClintock, working alone, who made monumental discoveries in genetics nearly 50 years ago that the world began to understand only in the last decade.

Look, of course, I can't claim to comprehend how science

does its work. Like many, my scientific understanding has been influenced by those Gary Larson cartoons. (Laughter.) Like the one where, after detailed calculations, Einstein discovers that time is actually money.

I'm not here as an expert, but as a believer. And one of the best things government can do to support the magnificent creativity and energy of the American technical community is to locate individual scientists with talent, furnish them with adequate resources and state-of-the-art instrumentation -- through agencies like our marvelous National Institutes of Health, the National Science Foundation, and then the Departments of Defense and Energy and others -- to help these investigators make progress.

But there are also scientific challenges that, because of their unprecedented scope and importance, demand unusual support and international cooperation. Already, the European Space Agency, Japan, and Canada are making hardware contributions valued at more than $7 billion for Space Station Freedom, a key component of our Space Exploration Initiative. Combined with our total investment of about $19 billion, this will be the largest international R&D project ever undertaken.

We're exploring new ways to encourage international cooperation on the big science projects, like mapping the human genome, global change research, and the superconducting super collider -- a technological giant that will recreate the fireball of our origins and allow us to study forms of matter that haven't existed since the birth of the universe.

There's a vote coming up in Congress this week on that super collider, so I'd like to call on the members to support that project, as well as our NASA budget. Only by doing so will we keep America on the leading edge of advancing human knowledge and pushing the limits of space exploration.

Tomorrow morning, the space shuttle is scheduled to lift into the heavens the most sophisticated celestial object that mankind has ever built -- the Hubble Telescope -- with the power to see the ends of the universe and back to the birth of time. I understand it's half a billion times more sensitive than the human eye. You talk about the vision thing -- try on the Hubble Telescope for size. (Laughter.)

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I'm blessed to be President at this fascinating time in the history of the world, in the history of our country. And as President, I can assure you of this: my administration is committed to supporting you as you pursue the knowledge that illuminates the world. Knowledge that will surely, ceaselessly continue to bring benefit to all mankind.

Thank you very much for what you do, and God bless each and every one of you. Thank you.

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END 2:28 P.M. EDT

NATIONAL ACADEMY OF SCIENCES
WASHINGTON, D.C.
MONDAY, APRIL 23, 1990
2:00 P.M.

DISTINGUISHED MEMBERS OF THE NATIONAL ACADEMY, DR. PRESS, DR. EBERT, DR. RAVEN, DR. GORDON, DR. BLOUT, DR. BROMLEY; ADMIRALS WATKINS AND TRULY ; LADIES AND GENTLEMEN: IT'S AN HONOR TO BE WITH YOU TODAY. THE ADVICE AND COUNSEL OF THIS ACADEMY HAS BEEN CRUCIAL TO AMERICAN PRESIDENTS FOR WELL OVER A CENTURY. I'M PROUD TO BE THE LATEST TO THANK YOU.

WE STAND AT A MOMENT OF WONDROUS PROSPERITY. BUT OUR WEALTH GOES FAR BEYOND THE MERELY MATERIAL. OURS IS AN INTELLECTUAL PROSPERITY, UNPRECEDENTED IN HISTORY. FOR THAT, AND THE HEALTH AND SECURITY IT AFFORDS THIS NATION AND THE WORLD, GRATITUDE IS OWED TO THE MEN AND WOMEN WHO HAVE COMMITTED THEIR MINDS AND LIVES TO SCIENCE.

THOSE DEVOTED TO SUCH WORK -- ITS PATIENT SEARCHING, ITS PASSIONATE STRUGGLES -- HAVE ENGAGED THEMSELVES IN MANKIND'S MOST EXALTED MISSION, AND THE MIND'S MANIFEST DESTINY: THE SEARCH FOR UNDERSTANDING.

PRESIDENT ABRAHAM LINCOLN ESTABLISHED THIS GREAT INSTITUTION IN THE DARK HOURS OF OUR NATION'S GREATEST CRISIS -- WHICH TESTIFIES TO THE ENDURING IMPORTANCE OF SCIENTIFIC KNOWLEDGE. IN THE YEARS THAT FOLLOWED YOUR ACADEMY HAS RESPONDED TO URGENT NATIONAL NEEDS IN TIMES OF WAR AND PEACE.

WHEN THIS MAGNIFICENT BUILDING WAS DEDICATED, CALVIN COOLIDGE PREDICTED "A NEW DAY IN SCIENTIFIC RESEARCH. A NEW SUN IS RISING," HE SAID. HE WAS RIGHT. THE AWESOME SCIENTIFIC ADVANCES OF THIS CENTURY, MANY OF WHICH YOU'VE BROUGHT ABOUT, BRING US EVER CLOSER TO UNDERSTANDING THE UNIVERSE, ITS ORIGINS, AND OUR OWN. AND SCIENCE HAS TOLD US A STRANGER AND MORE WONDROUS STORY THAN MYTH MIGHT EVER HAVE WRITTEN FOR US.

FOURSCORE AND TEN OR TWENTY BILLION YEARS AGO, THE THEORY GOES, IT ALL BEGAN -- WITH A UNIVERSE OF ENERGY AND MASS UNIMAGINABLY HOT AND COMPRESSED, CONTAINING EVERYTHING THAT WOULD BECOME WHAT WE NOW SEE IN THE HEAVENS. AND THEN, SCIENCE TELLS US -- IN ONE INCOMPREHENSIBLY POWERFUL INSTANT -- ENERGY AND MATTER OF EVERY KIND EXPLODED IN EVERY DIRECTION. [[OR AS A LAYMAN MIGHT EXPLAIN IT, SOMEBODY HIT THAT COSMIC BASEBALL RIGHT OUT OF THE PARK.]]

BUT WHILE THE PACE OF COSMIC CHANGE MAY HAVE BEGUN WITH BLINDING SPEED AND SLOWED DOWN SINCE, THE PACE OF OUR SCIENTIFIC EVOLUTION HAS BEEN ACCELERATING RAPIDLY. GROWING IN INTENSITY LIKE A SERIES OF CHAIN REACTIONS IN A CRITICAL MASS OF HIGHLY-TRAINED AMERICAN GREY MATTER -- TOUCHING OFF SCIENTIFIC AND TECHNICAL REVOLUTIONS IN EVERY DIRECTION.

TODAY, I WANT TO OUTLINE THE ROLE THIS ADMINISTRATION IS PLAYING TO ADVANCE THOSE REVOLUTIONS. BECAUSE AS THE PACE OF SCIENCE ACCELERATES, I BELIEVE THAT GOVERNMENT MUST KEEP PACE -- AND <u>WILL</u> KEEP PACE.

FIRST, WE'VE MOVED TO BETTER INTEGRATE SCIENCE AND TECHNOLOGY INTO THE POLICY PROCESS. WE HAVE CREATED AN INTERAGENCY WORKING GROUP THAT WILL MORE CLOSELY LINK SCIENCE AND TECHNOLOGY CONSIDERATIONS WITH THE POLICY-MAKING PROCESS OF THE ECONOMIC AND DOMESTIC POLICY COUNCILS.

MY ASSISTANT FOR SCIENCE AND TECHNOLOGY, DR. ALLAN BROMLEY, CHAIRS THIS WORKING GROUP AND PARTICIPATES IN THOSE COUNCILS, ADVISING THEM ON MATTERS RELATED TO SCIENCE AND TECHNOLOGY -- AS WELL AS SERVING ON THE NATIONAL SPACE COUNCIL.

AND WE'RE ALSO COMMITTED TO GREATER CROSS-FERTILIZATION WITH TALENT FROM THE PRIVATE SECTOR -- ON ISSUES RANGING FROM PURE RESEARCH TO MANUFACTURING PERFORMANCE. SO THIS YEAR WE CREATED A PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY -- EXPERTS WHOSE GUIDANCE I VALUE AND DEPEND ON. WE'LL ALSO BE LOOKING FOR COUNSEL FROM THIS ACADEMY'S NEW MANUFACTURING FORUM, JUST ANNOUNCED THIS MONTH.

WE WANT TO ADVANCE AMERICA'S TRADITION OF INNOVATION -- AND WE INTEND TO GET THE BIGGEST BANG FOR THE FEDERAL BUCK. THIS ADMINISTRATION HAS ALSO TAKEN STEPS TO REINVIGORATE THE FEDERAL COORDINATING COUNCIL FOR SCIENCE, ENGINEERING AND TECHNOLOGY -- IN ORDER TO ASSURE THAT THE FEDERAL INVESTMENTS IN R & D PROGRAMS ARE CLOSELY INTEGRATED ACROSS AGENCY BOUNDARIES.

IN JANUARY, WE SENT A BUDGET TO CONGRESS THAT INCLUDES A RECORD $71 BILLION FOR RESEARCH AND DEVELOPMENT -- AN INVESTMENT IN A STRONGER ECONOMY, A MORE SECURE NATION, AND A BRIGHTER FUTURE. OUR ADMINISTRATION IS COMMITTED TO INVESTING IN THE FUTURE -- IT'S EVIDENT IN THE POLICIES WE'RE CREATING, AND THE BUDGET WE'RE CALLING FOR -- WITH EVERYTHING FROM THE 24 PERCENT INCREASE FOR NASA, TO OUR SUPPORT OF A MAJOR AGRICULTURAL RESEARCH INITIATIVE.

TO IMPROVE THE INTERNATIONAL COMPETITIVENESS OF AMERICAN INDUSTRY, AND OUR OVERALL STANDARD OF LIVING, WE'VE CALLED FOR A PERMANENT EXTENSION OF THE RESEARCH AND EXPERIMENTATION TAX CREDIT. AND WE'RE WORKING TO LOWER THE COST OF CAPITAL AND CLEAR AWAY REGULATORY BURDENS, SO THAT INDUSTRY CAN MAKE THE KINDS OF INVESTMENTS THE FUTURE DEMANDS.

ALONG WITH THE APPLIED, MARKET-DRIVEN KNOWLEDGE SO CRUCIAL TO THIS COUNTRY'S COMPETITIVE FUTURE, LET ME REAFFIRM TWO OTHER PRIORITIES:

FIRST, MATH AND SCIENCE EDUCATION. WE UNDERSTAND THAT ONLY WITH A NEW GENERATION OF SCIENTISTS AND ENGINEERS WILL YOUR WORK, AND AMERICA'S PREEMINENCE, BE ASSURED. SO WE'RE ENGAGED IN A BROAD INITIATIVE OF REFORM AND RESTRUCTURING, IN COOPERATION WITH THE STATES. IT IS AN EFFORT THAT BEGAN WITH OUR FIRST-EVER EDUCATION SUMMIT WITH THE NATION'S GOVERNORS LAST FALL. OUR GOAL IS TO MAKE AMERICAN STUDENTS FIRST IN THE WORLD IN SCIENCE AND MATH ACHIEVEMENT BY THE END OF THIS CENTURY -- AND TO CONVINCE MORE WOMEN AND MINORITIES TO STUDY SCIENCE.

WE'RE PROVIDING A NUMBER OF NEW INCENTIVES FOR STUDENTS, LIKE THE NATIONAL SCIENCE SCHOLARS PROGRAM I'VE PROPOSED. WE'RE OPENING THE DOORS OF FEDERAL LABORATORIES, FACILITIES, AND AGENCIES TO STUDENTS AND TEACHERS. OUR BUDGET INCREASES FUNDING BY 26 PERCENT TO OVER ONE BILLION DOLLARS FOR SCIENCE, MATH, AND ENGINEERING EDUCATION -- THROUGH THE DEPARTMENTS OF EDUCATION, ENERGY, INTERIOR AND OTHERS, AS WELL AS THE NATIONAL SCIENCE FOUNDATION AND NASA.

TODAY I ASK OUR INDUSTRIAL AND BUSINESS COMMUNITIES TO CREATE NEW ALLIANCES FOR EDUCATION, MOBILIZING MORE OF THIS NATION'S GREAT TECHNICAL RESOURCES, FOR THE SAKE OF THE FUTURE.

WE ARE COMMITTED TO ENSURING THAT AMERICA HAS THE BRAINPOWER TO REMAIN AT THE FOREFRONT.

A SECOND PRIORITY OF THIS ADMINISTRATION IS BASIC RESEARCH -- THE HISTORICAL WELLSPRING OF THIS NATION'S WELL-BEING. SCIENCE MUST BE ABLE TO CONTINUE SEEKING ANSWERS TO OUR MOST FUNDAMENTAL QUESTIONS.

FOR SUCH REASONS OUR BUDGET CALLS FOR INCREASING FUNDING FOR THE U.S. GLOBAL CHANGE RESEARCH PROGRAM BY 57 PERCENT -- TO OVER ONE BILLION DOLLARS. AND EARLIER THIS YEAR, I REITERATED MY COMMITMENT TO DOUBLE THE NATIONAL SCIENCE FOUNDATION BUDGET BY 1993. TODAY, I WANT TO CALL ON CONGRESS: PUT OUR MONEY WHERE OUR FUTURE IS. PUT AN INCREASED NATIONAL SCIENCE FOUNDATION BUDGET BACK ON TRACK.

TODAY, SCIENCE AND TECHNOLOGY ARE ASSUMING A BROADER AND MORE INTERRELATED ROLE IN HUMAN LIFE THAN EVER BEFORE. THEY ARE BECOMING FORCES FOR HISTORICAL CHANGE.

SATELLITES ALREADY HELP US STUDY THE EARTH'S NATURAL SYSTEMS AND ASSESS ENVIRONMENTAL THREATS -- AND THE MISSION TO PLANET EARTH WILL FURTHER OUR WORK OF GLOBAL STEWARDSHIP.

BUT THIS PAST YEAR, IN THE REVOLUTION OF '89, WE HAVE ALSO SEEN COMMUNICATIONS SATELLITES, ALONG WITH VIDEO CAMERAS, VCR'S AND FAX MACHINES, BECOMING A POTENT FORCE FOR PEACE -- BOTH A PRODUCT OF SCIENCE AND A SOURCE OF CONSCIENCE -- BRINGING THE ACTIONS OF NATIONS BEFORE THE EYES OF THE WORLD.

PICTURES FROM POLAND AND SOUTH AFRICA, SCENES ON THE BERLIN WALL... THE EYE OF TECHNOLOGY HAS PROVED MORE POWERFUL THAN CHISELS FOR BREAKING DOWN BARRIERS -- ETCHING THE IDEA OF FREEDOM ON THE PSYCHE OF HUMANITY -- AND SETTING OFF A WONDROUS, HOPEFUL, POLITICAL CHAIN REACTION, WORLDWIDE.

IT'S NO ACCIDENT THAT MANY OF THE INDIVIDUALS AT THE CENTER OF TODAY'S WORLDWIDE POLITICAL REVOLUTIONS SHARE A VISION OF THE FUTURE BASED ON PERSONAL FREEDOM, OPENNESS, AND FREEDOM OF INQUIRY. THESE VALUES ARE SHARED BY OUR POLITICAL SYSTEM AND BY SCIENCE ALIKE. SCIENCE, LIKE ANY FIELD OF ENDEAVOR, RELIES ON FREEDOM OF INQUIRY. AND ONE OF THE HALLMARKS OF THAT FREEDOM IS OBJECTIVITY.

NOW MORE THAN EVER -- ON ISSUES RANGING FROM CLIMATE CHANGE, TO A.I.D.S. RESEARCH, TO GENETIC ENGINEERING, TO FOOD ADDITIVES -- GOVERNMENT RELIES ON THE IMPARTIAL PERSPECTIVE OF SCIENCE FOR GUIDANCE. AND AS THE FRONTIERS OF KNOWLEDGE ARE INCREASINGLY DISTANT FROM THE UNDERSTANDING OF THE MANY, IT IS EVER MORE IMPORTANT THAT WE CAN TURN TO THE FEW FOR STRAIGHTFORWARD ADVICE.

THE NATIONAL ACADEMY OF SCIENCES IS RENOWNED FOR OBJECTIVITY AND IMMUNITY TO PARTISAN PRESSURES. YOUR IMPARTIAL GUIDANCE HAS BEEN INVALUABLE TO AMERICAN PRESIDENTS, AND THE AMERICAN PEOPLE, FOR WELL OVER A CENTURY. SO I AM CONFIDENT THAT THE MEMBERS OF THIS BODY -- THE MOST DISTINGUISHED SCIENTISTS IN AMERICA -- WILL CONTINUE THE TRADITION THAT HAS BEEN THE ACADEMY'S HALLMARK.

ON THIS I KNOW WE AGREE -- BECAUSE SO MANY OF OUR TECHNICAL AND SCIENTIFIC ACHIEVEMENTS HAVE BEEN THE PRODUCTS OF INDEPENDENT MINDS. AND IF THE EARTH-MOVING EVENTS OF 1989 REMINDED US OF ANYTHING, IT'S THAT COMPLEX BUREAUCRACIES AND CENTRALIZED PLANNING DON'T WORK WELL IN THE GOVERNANCE OF SOCIETIES. WE WILL NOT TRY TO IMPOSE THEM ON SCIENCE.

JUST AS ENTREPRENEURS AND SMALL BUSINESSES FUEL THE GROWTH OF THE AMERICAN ECONOMY, THE BACKBONE OF AMERICAN SCIENCE IS ITS BRILLIANT ARRAY OF INDIVIDUAL INVESTIGATORS, SPREAD ACROSS THE NATION.

AMONG SO MANY, THINK OF CHESTER CARLSON, WHO INVENTED THE PHOTOCOPY MACHINE IN A LITTLE ROOM OVER A LONG ISLAND PUB. OR BARBARA MCCLINTOCK, WORKING ALONE, WHO MADE MONUMENTAL DISCOVERIES IN GENETICS NEARLY 50 YEARS AGO THAT THE WORLD BEGAN TO UNDERSTAND ONLY IN THE LAST DECADE.

[[OF COURSE, I CAN'T CLAIM TO COMPREHEND HOW SCIENCE DOES ITS WORK. LIKE MANY, MY SCIENTIFIC UNDERSTANDING HAS BEEN INFLUENCED BY THOSE GARY LARSON CARTOONS. LIKE THE ONE WHERE, AFTER DETAILED CALCULATIONS, EINSTEIN DISCOVERS THAT TIME IS ACTUALLY MONEY.]]

ONE OF THE BEST THINGS GOVERNMENT CAN DO TO SUPPORT THE MAGNIFICENT CREATIVITY AND ENERGY OF THE AMERICAN TECHNICAL COMMUNITY IS TO LOCATE INDIVIDUAL SCIENTISTS WITH TALENT, AND FURNISH THEM WITH ADEQUATE RESOURCES AND STATE-OF-THE-ART INSTRUMENTATION -- THROUGH AGENCIES LIKE THE NATIONAL INSTITUTES OF HEALTH, THE NATIONAL SCIENCE FOUNDATION, THE DEPARTMENTS OF DEFENSE AND ENERGY, AND OTHERS -- TO HELP THESE INVESTIGATORS MAKE PROGRESS.

BUT THERE ARE ALSO SCIENTIFIC CHALLENGES THAT, BECAUSE OF THEIR UNPRECEDENTED SCOPE AND IMPORTANCE, DEMAND UNUSUAL SUPPORT -- AND INTERNATIONAL COOPERATION. ALREADY, THE EUROPEAN SPACE AGENCY, JAPAN, AND CANADA ARE MAKING HARDWARE CONTRIBUTIONS VALUED AT MORE THAN SEVEN BILLION DOLLARS FOR SPACE STATION FREEDOM -- A KEY COMPONENT OF OUR SPACE EXPLORATION INITIATIVE. COMBINED WITH OUR TOTAL INVESTMENT OF ABOUT 19 BILLION DOLLARS, THIS WILL BE THE LARGEST INTERNATIONAL R & D PROJECT EVER UNDERTAKEN.

WE'RE EXPLORING NEW WAYS TO ENCOURAGE INTERNATIONAL COOPERATION ON OTHER BIG SCIENCE PROJECTS -- LIKE MAPPING THE HUMAN GENOME [GEE-NOME], GLOBAL CHANGE RESEARCH, AND THE SUPERCONDUCTING SUPER COLLIDER -- A TECHNOLOGICAL GIANT THAT WILL RECREATE THE FIREBALL OF OUR ORIGINS, AND ALLOW US TO STUDY FORMS OF MATTER THAT HAVEN'T EXISTED SINCE THE BIRTH OF THE UNIVERSE.

THERE'S A VOTE COMING UP IN CONGRESS THIS WEEK ON THAT SUPER COLLIDER -- SO I'D LIKE TO CALL ON THE MEMBERS TO SUPPORT THAT PROJECT, AS WELL AS OUR NASA BUDGET. ONLY BY DOING SO WILL WE KEEP AMERICA ON THE LEADING EDGE OF ADVANCING HUMAN KNOWLEDGE, AND PUSHING THE LIMITS OF SPACE EXPLORATION.

TOMORROW MORNING, THE SPACE SHUTTLE IS SCHEDULED TO LIFT INTO THE HEAVENS THE MOST SOPHISTICATED CELESTIAL OBJECT THAT MANKIND HAS EVER BUILT -- THE HUBBLE TELESCOPE -- WITH THE POWER TO SEE TO THE ENDS OF THE UNIVERSE, AND BACK TO THE BIRTH OF TIME. [[I UNDERSTAND IT'S HALF A BILLION TIMES MORE SENSITIVE THAN THE HUMAN EYE. TALK ABOUT THE VISION THING...]]

ON THE SOUTHWEST GROUNDS OF THIS GREAT ACADEMY RESTS A BRONZE MEMORIAL TO A SCIENTIST WHO HELPED REDEFINE MANKIND'S UNDERSTANDING OF TIME AND SPACE, OF MATTER AND ENERGY. AMONG THE ENGRAVINGS ON THAT MEMORIAL ARE WORDS OF WONDER -- ABOUT THE "JOY AND AMAZEMENT" EINSTEIN FELT, "AT THE BEAUTY AND GRANDEUR OF THIS WORLD, OF WHICH MAN CAN JUST FORM A FAINT NOTION."

YOUR WORK, THE WORK OF SCIENCE, DAILY BRINGS THAT BEAUTY AND GRANDEUR INTO SHARPER FOCUS.

AS PRESIDENT I CAN ASSURE YOU OF THIS: MY ADMINISTRATION IS COMMITTED TO SUPPORTING YOU, AS YOU PURSUE THE KNOWLEDGE THAT ILLUMINATES THE WORLD. KNOWLEDGE THAT WILL SURELY, CEASELESSLY CONTINUE TO BRING BENEFIT TO ALL MANKIND.

THANK YOU. GOD BLESS YOU. AND GOD BLESS THIS GREAT ACADEMY.

# # #

Document No. 134261

WHITE HOUSE STAFFING MEMORANDUM

DATE: 04/19/90 **ACTION/CONCURRENCE/COMMENT DUE BY:** 2:00p.m. 04/20

SUBJECT: PRESIDENTIAL REMARKS: NATIONAL ACADEMY OF SCIENCES (04/19 3:15p.m. draft)

	ACTION	FYI		ACTION	FYI
VICE PRESIDENT	☐	☑	MCCLURE	☑	☐
SUNUNU	☐	☑	NEWMAN	☐	☐
SCOWCROFT	☑	☐	PORTER	☑	☐
DARMAN	☑	☐	ROGICH	☑	☐
BATES	☑	☐	UNTERMEYER	☑	☐
CARD	☐	☑	ROGERS	☐	☑
CICCONI	☐	☑	PINKERTON N/C	☑	☐
DEMAREST	☑	☐	WINSTON	☐	☑
FITZWATER	☐	☑	BROMLEY	☑	☐
GRAY	☑	☐	_____	☐	☐
HAGIN	☐	☐	_____	☐	☐

REMARKS:

Please provide any comments/recommendations directly to Chriss Winston by 2:00 p.m. on Friday 04/20, with a copy to my office. Thanks.

RESPONSE:

James W. Cicconi
Assistant to the President
and Deputy to the Chief of Staff
Ext. 2702

Mission to Planet Earth
Global Stewardship

(Lange/Cawley)
April 19, 1990
3:15 P.M.
[SCI.DOC]

PRESIDENTIAL ADDRESS: NATIONAL ACADEMY OF SCIENCES
WASHINGTON, D.C.
MONDAY, APRIL 23, 1990
2:00 P.M.

Thank you, Frank [Press]. Distinguished members of the National Academy, Dr. Press, Dr. Bromley, ladies and gentlemen: It's an honor to be with you today. The advice and counsel of this Academy has been crucial to American Presidents for well over a century. I'm proud to be the latest to thank you.

We stand at a moment of wondrous prosperity. But our wealth goes far beyond the merely material. Ours is an **intellectual** prosperity, unprecedented in history. For that, and the health and security it affords this nation and the world, gratitude is owed to the men and women who have committed their minds and lives to science.

Those devoted to such work -- its patient searching, its passionate struggles -- have engaged themselves in mankind's most exalted mission, and the mind's manifest destiny: the search for understanding.

President Abraham Lincoln established this great institution in the dark hours of our nation's greatest crisis -- which testifies to the enduring importance of scientific knowledge. And when this magnificent building was ~~finally~~ dedicated, Calvin Coolidge predicted "a new day in scientific research. A new sun is rising," he said.

In the times that followed your academy ~~has~~ responded to urgent national needs in war and peace.

He was right. The awesome scientific advances of this century, many of which you've brought about, bring us ever closer to understanding the universe, its origins, and our own. And science has told us a stranger and more wondrous story than myth might ever have written for us.

Fourscore and ten or twenty billion years ago, it all began. With a quantity of energy and mass unimaginably hot and dense, about the size of a baseball, containing everything that would become the universe, they say. And then, in one incomprehensibly powerful instant, energy and matter of every kind exploded in at least four dimensions. Or in a layman's terms, somebody hit that cosmic baseball right out of the park.

But while the pace of ~~universal~~ cosmic change may have begun with blinding speed and slowed down since, the pace of our **scientific** evolution has been accelerating rapidly. Growing in intensity throughout this century like a series of chain reactions in a critical mass of highly-trained American grey matter -- touching off revolutions in every direction.

Today, I want to outline the role this Administration is playing to fuel those revolutions. Because as the pace of science accelerates, I believe that **government must keep pace -- and <u>will</u> keep pace.** ~~-- with science~~.

First, we've moved to better integrate science and technology into the policy process. My assistant for Science and Technology, Dr. Allan Bromley, is an active participant ~~member~~ of the Economic and Domestic Policy Councils, and chairs a White House Working Group as well as serving on the National Space Council.

that advises the Domestic Policy Council. And we're already working to better integrate our science and technology efforts across the spectrum -- to get the "biggest bang" out of those big bucks.

But beyond the Federal role, we're committed to greater cross-fertilization with talent from the private sector -- on issues ranging from pure research to manufacturing performance.

So this year we created a President's Council of Science and Technology Advisors -- experts whose guidance ~~has already been invaluable~~. We'll also be looking for counsel from this Academy's new Manufacturing Forum, just established this month.

We're committed to advancing America's tradition of innovation -- so our '91 budget called for a substantial increase in civilian research and development, and a permanent extension of the research and experimentation tax credit. But along with the applied, market-driven knowledge so crucial to this country's competitive future, let me reaffirm two priorities.

First, **math and science education** -- where we're engaged in a broad effort of reform and restructuring in cooperation with the states that began with our first-ever Education Summit with the nation's governors last fall. Our goal is to make American students first in the world in science and math achievement by the end of this century.

Today, I call on all Federal laboratories, facilities, and agencies to open their doors to students and teachers -- and get involved with education at the local level. And I ask our

industrial and business communities to create new alliances for education, mobilizing more of this nation's great technical resources, for the sake of the future.

The second priority I'd reaffirm is **basic research** -- the historical wellspring of this nation's well-being. Science must be able to continue seeking answers to our most fundamental questions. ~~But here, some vigilance is needed~~. Earlier this year, I ~~proposed~~ reiterated my commitment to double the National Science Foundation budget by 1993. **Today, I want to call on Congress: Put our money where our future is. Put ~~the~~ an increased National Science Foundation budget back on track.**

Without strong science we are blind: unable to grasp the real parameters of the present, or real potential of the future. But with the past as prologue, we know that **the investments we make in science are some of mankind's most promising.**

Satellites already help us study the earth's natural systems and assess environmental threats. And combined with video cameras they've become a potent force for peace -- both a product of science and a source of conscience -- **bringing the actions of nations before the eyes of the world.**

Pictures from Poland, scenes on the Berlin Wall... the eye of technology has proved more powerful than chisels for breaking down barriers -- etching the idea of freedom on the psyche of humanity -- and setting off a wondrous, hopeful, **political** chain reaction, worldwide.

Molecular biology, already responsible for agricultural advances that help feed the world, is tackling the challenge and promise of mapping the genome [GEE-nome] -- breaking the code of human life that might allow us to isolate and conquer such diseases as A.I.D.S., and cancer.

And just this month -- while one group of scientists pulled strands of D.N.A. from a 17 million-year-old magnolia leaf buried at the bottom of an ancient lake in northern Utah -- another group in San Jose managed to see and manipulate single **atoms** under a new scanning microscope -- bringing us a step closer to the creation of man-made molecules, new generations of tailored materials with undreamed-of properties, and computers with inconceivable power.

[[Of course, I can't claim to comprehend all of this. Like many, I've gained my scientific understanding from those Gary Larson cartoons. Like the one where, after detailed calculations, Einstein discovers that Time is actually Money.]]

While this administration is convinced that science is a priority investment -- and we're **committed** to keeping pace with science, as partner and catalyst -- we will not attempt to <u>direct</u> the course of science, any more than we would dictate the work of art, music, or literature.

Now more than ever -- on issues ranging from climate change, to A.I.D.S. research, to genetic engineering, to food additives -- we rely on the objective perspective of science for guidance. And as the frontiers of knowledge are increasingly distant from

the understanding of the many, it is ever more important that we can turn to the few for straightforward advice.

The National Academy of Sciences is **renowned** for objectivity and immunity to partisan pressures. So it is **essential** that the members of this body -- the most distinguished scientists in America -- preserve the objectivity that has been the Academy's hallmark.

On this I know we agree -- because so many of our technical and scientific achievements have been the products of independent minds. And if the earth-moving events of 1989 reminded us of anything, it's that complex bureaucracies and centralized planning don't work well in the governance of societies. **We will not try to impose them on science.**

Just as entrepreneurs and small businesses fuel the growth of the American economy, the backbone of American science is its brilliant array of individual investigators, spread across the nation, well, like a "thousand points of enlightenment."

Among so many, think of two physicists who worked in secret because their firm wouldn't approve it, and discovered low-temperature superconductivity. Or Chester Carlson, who invented the Xerox machine in a little room behind a beauty parlor. Or Barbara McClintock, working alone, who made monumental discoveries in genetics 40 years ago that the world began to understand only in the last decade.

One of the **best** things government can do to support the magnificent creativity and energy of the American technical

community is to locate individual scientists with talent, and through agencies like N.I.H., N.S.F., and others, furnish them with the equivalent of venture capital. But there are **also** scientific challenges that, because of their unprecedented scope, demand unusual support.

So we maintain a balanced commitment to projects like Space Station Freedom. And the new Supercollider -- so critical to retaining our scientific talent -- that will re-create the unimaginable fireball of our origins in miniature, allowing us to study matter that hasn't existed since the birth of the universe.

Leading-edge technologies often help us find what we aren't even looking for -- whether it's breaking the genetic code of life, or getting a new look at the most ancient forms of light.

Our space program is a leading example -- as is the Hubble telescope -- the most sophisticated celestial object mankind has ever tried to lift into the heavens, with the power to see to the ends of the universe, and back to the birth of time.

[[I understand it's half a billion times more sensitive than the human eye. Talk about the vision thing...]]

On the southwest grounds of this great Academy rests a bronze memorial to a scientist who helped redefine mankind's understanding of time and space, of matter and energy. Among the engravings on that memorial are words of wonder -- about the "joy and amazement" Einstein felt, "at the beauty and grandeur of this world, of which man can just form a faint notion." Your work,

the work of science, daily brings that beauty and grandeur into sharper focus.

Still, if Nature were a goddess, she would be a clever and imaginative one, with an endlessly amusing habit of resting just beyond anticipation... but not quite beyond the reach of imagination.

We count on you to ask the questions that confound us -- and to struggle, that solutions might not manage forever to evade us. Because for those whose hearts are as open as their minds, the answers will surely, ceaselessly, enlighten and amaze us.

Thank you. And God bless you.

# # #

INSERT F:

Big Sci:

Even as individual scientists continue to make breathtaking discoveries, some science and technology has grown larger than any one person, or even any one nation. Some scientific challenges, because of their unprecedented scope, and because they produce knowledge that benefits all mankind, demand international cooperation. Already, the European Space Agency, Japan, and Canada are making hardware contributions valued at more than $7 billion for Space Station Freedom. Combined with the total U.S. investment of about $16 billion, this will be the largest international R&D project ever undertaken. We are exploring new ways to encourage international cooperation on other big science projects, like the Superconducting Super Collider, mapping the human genome, and global change research.

International cooperation has also been a big part of one of the most exciting scientific projects of our time. Tomorrow morning the Space Shuttle is scheduled to lift the Hubble space telescope into orbit -- the most sophisticated celestial object that mankind has ever built, with the power to see to the ends of the universe, and back to the birth of time. Some have compared the views we'll get from the space telescope with the first views Galileo had of the heavens when he raised his homemade telescope toward the sky.

Presidential Address to National Academy of Sciences
Comments from the Department of Energy

p. 1, para. 4: The other President worth mentioning here is Woodrow Wilson, who established the National Academy of Sciences' operating arm--the National Research Council--in 1918. This Research Council allows scientists nationwide to participate in the Academy's mission of advising the U.S. government, and is an institution unique among Academies of Science worldwide.

#1

Suggested sentence to follow "importance of scientific knowledge." in the text: *"After the Academy organized our scientific efforts to win the First World War, President Wilson perpetuated your National Research Council--a source of impartial scientific advice without parallel in the world."*

p. 3, para. 5 Not strong enough. Need words "new mission." Point of business alliances is that they are with Federal agencies. This President has got to talk about volunteerism and about women and minorities. Must credit NASA and DOE leadership.

#2 reworked - see inserted page (after p. 3)

"Therefore, I am charging our Federal research complex with a new mission. Starting today, all laboratories, facilities and agencies must open their doors to students and teachers -- and become the world's greatest scientific instrument for education.

The rest of the Federal government must follow the lead of NASA and the Department of Energy and send our scientists and engineers into the community as volunteer teachers. We must bring greater numbers of women and minorities into science and technology careers. And we must work in tandem with the States the education communities and with business and industry to create new alliances for education, mobilizing more of this nation's great technical resources, for the sake of our future."

p. 4, para. 3-4: Two ideas are coupled here that don't belong with each other. Satellites do help us study the earth. But the only country that releases video images of newsworthy events taken from satellites is France (the SPOT satellite). At the current time, the U.S. government does not do so, presumably because such images would compromise our intelligence capabilities. Suggest that you refocus these two paragraphs on the Administration's initiative in the FY 91 budget on "Mission to Planet Earth" and the President's theme of "Global Stewardship."

#3

Suggested sentences to replace paragraphs beginning "Satellites already..." and "Pictures from Poland..." in the text: *"Satellites already help us study the earth's natural systems*

and assess environmental threats. With strong input from the scientific community, my Administration has put together a comprehensive plan for a 'Mission to Planet Earth.' This initiative will use satellites to acquire the kind of simultaneous data, on a global scale, that will take us to a new level of sophistication in our understanding of the earth as an integrated system. My vision of 'Global Stewardship' is crucially dependent on the knowledge and insights that will come from the earth, atmospheric, and environmental sciences."

p. 5, para. 1: Most of the big advances in agriculture have come from "old-fashioned" genetics and cross-breeding, not molecular biology. There are a lot of geneticists in the Academy who will perceive the first sentence in this paragraph as inaccurate. What molecular biology has done recently is revolutionize the production of pharmaceuticals (e.g., insulin, interferon, TPA) and medical diagnostics. You should emphasize this.

#4

Suggested phrase to replace "~~already responsible for agricultural advances that help feed the world~~" in the text: *"which has revolutionized medical diagnosis and the production of pharmaceuticals".*

Also, suggest you change "isolate and conquer" to *"understand and conquer".* We've already isolated the HIV virus that causes AIDS, and cancer is caused by a multiplicity of agents--not by a bacterium or virus to be isolated.

p. 5, para. 2: "Man-made molecules" are a dime a dozen. Nylon and many commodity chemicals would qualify in this category. This sentence reads better and is more accurate without such a reference.

#5

Suggest changing the end of the paragraph to read *"--bringing us a step closer to new generations of tailored materials with undreamed-of properties; materials that can be used, for example, to create computers with inconceivable power."*

p. 5, para. 4: The reference to not "directing" the course of science may seem odd to your audience. From their perspective, the Administration directs the course of science in each fiscal year's budget that establishes, for example, how much the NSF Division of Physics gets as compared to how much the NSF Division of Chemistry gets. The point that you want to make, it seems, is better stated in paragraph 2 of page 6 ("complex bureaucracies and centralized planning"). So it's not really needed here, and the paragraph would be stronger without this reference.

#6

seems to be addressing the NEA controversy — why do it? (DPC)

Suggest deleting the last phrase of paragraph, beginning with "we will not attempt..." and removing the first word of the sentence, "While."

p. 6, para. 4: The reference to "who worked in secret because their firm wouldn't approve it" is dead wrong, and a potential embarrassment coming from the President. The two scientists (both of whom, by the way, are Foreign Associates of the National Academy of Sciences) were IBM Fellows, a position in IBM that explicitly permits incumbents the freedom to pursue independent projects. We should be praising this sort of far-sighted research management in industry, not damning IBM for it. And they discovered "high-temperature superconductivity."

#7

Suggest replacing the first sentence with *"Among so many, think of two Foreign Associates of this Academy--[Gerd] Binnig and [Heinrich] Rohrer--who debunked conventional wisdom with their discovery of high-temperature superconductivity in ceramic materials."*

p. 7, para. 1: In line 2, DOE deserves mention with NIH and NSF--our research and development budget is three times that of NSF.

#8

p. 7, para. 1: The reference to "venture capital" is likely to strike the audience as advocating stingy funding of single-investigator science. A major issue for scientists is the fact that packages of support from individual agencies are too small to conduct work efficiently, so they must write multiple grant proposals to fund a single project. While the President can't solve this problem in his speech the following replacement wording will make a better impression before he gets into the part of the speech on "big science."

#9

Suggest replacing end of first sentence on page, after "and others," with the following text: *"and others, furnish them with adequate resources--including state-of-the-art instrumentation--to make optimal progress."*

p. 7, para. 2: The sentence about the Supercollider needs brushing up. The parenthetical comment is overbroad and likely to draw fire. A more accurate sentence would be:

#10

"And the new Supercollider--so critical to understanding the origin of mass--that will recreate the unimaginable fireball of our origins in miniature, allowing us to study matter at energy levels that haven't existed since the birth of the universe."

Rob:

Would there be any way to orient this more toward upcoming votes with something like this:

"There is a series of votes coming up in Congress on our space and science program, beginning this week with a vote on the supercollider. I call on Congress to fully fund these projects and my NASA budget. Only by doing so will we keep America on the cutting edge of advancing human knowledge and pushing the limits of space exploration."

Anything like that would be very helpful. Thanks.....

Jack

add

P.S. ?

mclure

The budget proposes several initiatives that could improve the international competitiveness of American industry and our overall standard of living. That's the third area I wanted to discuss. We're proposing steps, such as developing advanced technologies and making the research and experimentation tax credit permanent, that have both public and private benefits. We're also working to lower the cost of capital and clear away regulatory burdens so that industry can make the investments in the future that this country needs.

Insert A

Regarding technology, this administration is committed to working with industry to develop the generic, precompetitive technologies that support both economic competitiveness and our national security. These technologies do not give an advantage to any one company, but they help whole industries and economic sectors advance in the global marketplace. We need to find ways that American industry can better translate new ideas and technologies into marketable products. Many of these same technologies also support our national security, by giving us the technological edge that will be essential in a rapidly changing world.

Finally, I want to point out that none of the things I've been discussing will occur if this country does not produce the new generation of scientists and engineers needed to carry on your work, as well as to operate an increasingly technical society.

INSERT D:

Education is important for another reason. We all know that science and technology have become more and more intertwined with our daily lives. But today science and technology are assuming an even broader role -- they are becoming forces for historical change.

INSERT 4:

There are many things that must be done to achieve this goal. We must provide students with new incentives to study science and engineering, such as the National Science Scholars program that I have proposed. We must convince more women and minorities to study science. The budget proposes increasing federal funding for science, mathematics, and engineering education in five federal agencies by 26 percent, to a total of over $1 billion.

We must also work together -- the federal government and the scientific community -- to improve science, mathematics, and engineering education.

THE WHITE HOUSE

WASHINGTON

Bates

INSERT: (PAGE 3)

Therefore, I am charging our Federal research complex with a new mission. Starting today, all Federal laboratories, facilities and agencies must open their doors to students and teachers -- and become the world's greatest scientific instrument for education. Through the Departments of Education, Energy, Interior and others, the National Science Foundation and NASA, we are already reaching thousands of youngsters. Through this new effort we should reach thousands more. We must bring greater numbers of women and minorities into science and technology careers. I look to my Domestic Policy Council and to the Federal Coordinating Council on Science, Engineering and Technology to coordinate this new initiative. And I ask our . . .

p. 3 rewrite

see also Energy

(Lange/Cawley)
April 20, 1990
7:15 P.M.
[SCI.DOC]

PRESIDENTIAL ADDRESS: NATIONAL ACADEMY OF SCIENCES
WASHINGTON, D.C.
MONDAY, APRIL 23, 1990
2:00 P.M.

Distinguished members of the National Academy, Dr. Press, Dr. Ebert, Dr. Raven, Dr. Gordon, Dr. Blout, Dr. Bromley, ladies and gentlemen: It's an honor to be with you today. The advice and counsel of this Academy has been crucial to American Presidents for well over a century. I'm proud to be the latest to thank you.

We stand at a moment of wondrous prosperity. But our wealth goes far beyond the merely material. Ours is an **intellectual** prosperity, unprecedented in history. For that, and the health and security it affords this nation and the world, gratitude is owed to the men and women who have committed their minds and lives to science.

Those devoted to such work -- its patient searching, its passionate struggles -- have engaged themselves in mankind's most exalted mission, and the mind's manifest destiny: the search for understanding.

President Abraham Lincoln established this great institution in the dark hours of our nation's greatest crisis -- which testifies to the enduring importance of scientific knowledge. In the years that followed your academy has responded to urgent national needs in war and in peace.

When this magnificent building was finally dedicated, Calvin Coolidge predicted "a new day in scientific research. A new sun is rising," he said. He was right. The awesome scientific advances of this century, many of which you've brought about, bring us ever closer to understanding the universe, its origins, and our own. And science has told us a stranger and more wondrous story than myth might ever have written for us.

Fourscore and ten or twenty billion years ago, the theory goes, it all began -- with a universe of energy and mass unimaginably hot and compressed, containing everything that would become what we now see in the heavens. And then, they say -- in one incomprehensibly powerful instant -- energy and matter of every kind exploded in every direction. [[Or as a layman might explain it, somebody hit that cosmic baseball right out of the park.]]

But while the pace of **cosmic** change may have begun with blinding speed and slowed down since, the pace of our **scientific** evolution has been accelerating rapidly. Growing in intensity ~~throughout this century~~ like a series of chain reactions in a critical mass of highly-trained American grey matter -- touching off scientific and technical revolutions in every direction.

Today, I want to outline the role this Administration is playing to advance those revolutions. Because as the pace of science accelerates, I believe that **government must keep pace -- and <u>will</u> keep pace.**

First, we've moved to better integrate science and technology into the policy process. My Assistant for Science and Technology, Dr. Allan Bromley, is an active participant ~~of~~ in the Economic and Domestic Policy Councils, as well as serving on the National Space Council, and he chairs a White House Working Group that is going to ~~pull together and~~ improve coordination in Federal programs in areas like education, computing, and high technology -- **so that America remains at the forefront.**

We're committed to greater cross-fertilization with talent from the private sector -- on issues ranging from pure research to manufacturing performance. So this year we created a President's Council of Advisors on Science and Technology -- experts whose guidance I value and depend on. We'll also be looking for counsel from this Academy's new Manufacturing Forum, just established this month.

We want to advance America's tradition of innovation -- and we intend to get the biggest bang for the Federal buck. So in January we sent a budget to Congress that includes a **record $71 billion for research and development** -- an investment in a stronger economy, a more secure nation, and a brighter future.

Our budget calls for increasing funding for the U.S. Global Change Research Program by 57 percent -- to over one billion dollars.

To improve the international competitiveness of American industry, and our overall standard of living, we've

called for a permanent extension of the research and experimentation tax credit. And we're working to lower the cost of capital and clear away regulatory burdens, so that industry can make the kinds of investments the future demands.

But along with the applied, market-driven knowledge so crucial to this country's competitive future, let me reaffirm two priorities:

First, **math and science education** -- where we're engaged in a broad initiative of reform and restructuring, in cooperation with the states. It is an effort that began with our first-ever Education Summit with the nation's governors last fall. Our goal is to make American students first in the world in science and math achievement by the end of this century -- and to convince more women and minorities to study science.

So we're providing new incentives for students, like the National Science Scholars program I've proposed. We're opening the doors of Federal laboratories, facilities, and agencies to students and teachers. Our budget increases funding to **over one billion dollars** for science, math, and engineering education -- through the Departments of Education, Energy, Interior and others, as well as the National Science Foundation and NASA.

A second priority I'd reaffirm is **basic research** -- the historical wellspring of this nation's well-being. Science must be able to continue seeking answers to our most fundamental questions. Earlier this year, I reiterated my commitment to double the National Science Foundation budget by 1993. **Today, I**

want to call on Congress: Put our money where our future is. Put an increased National Science Foundation budget back on track.

Today, science and technology are assuming a broader and more interrelated role in human life than ever before. They are becoming forces for historical change.

Satellites already help us study the earth's natural systems and assess environmental threats -- and the Mission to Planet Earth will further our work of global stewardship. ~~Combined with video cameras,~~ Communications satellites, along with video cameras, VCRs and FAX machines, have become a potent force for peace -- both a product of science and a source of conscience -- **bringing the actions of nations before the eyes of the world.**

Pictures from Poland and South Africa, scenes on the Berlin Wall... the eye of technology has proved more powerful than chisels for breaking down barriers -- etching the idea of freedom on the psyche of humanity -- and setting off a wondrous, hopeful, **political** chain reaction, worldwide.

It's no accident that many of the individuals at the center of today's worldwide political revolutions share a vision of the future based on personal freedom, openness, and freedom of inquiry. These values are shared by our political system and by science alike.

Now more than ever -- on issues ranging from climate change, to A.I.D.S. research, to genetic engineering, to food additives

-- government relies on the ~~objective~~ impartial perspective of science for guidance. And as the frontiers of knowledge are increasingly distant from the understanding of the many, it is ever more important that we can turn to the few for straightforward advice.

The National Academy of Sciences is **renowned** for objectivity and immunity to partisan pressures. Your impartial guidance has been invaluable to American Presidents, and the American people, for well over a century. So I am ~~quite~~ confident that the members of this body -- the most distinguished scientists in America -- will continue ~~the~~ in the tradition ~~of objectivity~~ that has been the Academy's hallmark.

On this I know we agree -- because so many of our technical and scientific achievements have been the products of independent minds. And if the earth-moving events of 1989 reminded us of anything, it's that complex bureaucracies and centralized planning don't work well in the governance of societies. **We will not try to impose them on science.**

Just as entrepreneurs and small businesses fuel the growth of the American economy, the backbone of American science is its brilliant array of individual investigators, spread across the nation ~~like, well, "a thousand points of enlightenment."~~

Among so many, think of Chester Carlson, who invented the photocopy machine in a little room behind a beauty parlor. Or Barbara McClintock, working alone, who made monumental discoveries in genetics nearly 50 years ago that the world began to understand only in the last decade.

[[Of course, I can't claim to comprehend how science does its work. Like many, my scientific understanding has been influenced by those Gary Larson cartoons. Like the one where, after detailed calculations, Einstein discovers that Time is actually Money.]]

One of the **best** things government can do to support the magnificent creativity and energy of the American technical community is to locate individual scientists with talent, and furnish them with adequate resources and state-of-the-art instrumentation -- through agencies like the National Institutes of Health, the National Science Foundation, the Departments of Defense and Energy, and others -- to help these investigators make progress.

But there are **also** scientific challenges that, because of their unprecedented scope and importance, demand unusual support -- and international cooperation. Already, the European Space Agency, Japan, and Canada are making hardware contributions valued at more than seven billion dollars for **Space Station Freedom**. Combined with our total investment of about 16 billion dollars, this will be the largest international R & D project ever undertaken.

We're exploring new ways to encourage international cooperation on other big science projects -- like mapping the human genome [GEE-nome], global change research, and the Superconducting Super Collider, that will recreate the fireball of our origins, and allow us to study forms of matter that haven't existed since the birth of the universe.

There's a vote coming up in Congress this week on that Super Collider -- so I'd like to call on the members to fully fund that project, as well as our NASA budget. Only by doing so will we keep America on the leading edge of advancing human knowledge, and pushing the limits of space exploration.

Tomorrow morning, the Space Shuttle is scheduled to lift into the heavens the most sophisticated celestial object that mankind has ever built -- with the power to see to the ends of the universe, and back to the birth of time. [[I understand it's half a billion times more sensitive than the human eye. Talk about the vision thing...]]

On the southwest grounds of this great Academy rests a bronze memorial to a scientist who helped redefine mankind's understanding of time and space, of matter and energy. Among the engravings on that memorial are words of wonder -- about the "joy and amazement" Einstein felt, "at the beauty and grandeur of this world, of which man can just form a faint notion."

Your work, the work of science, daily brings that beauty and grandeur into sharper focus.

As President I can assure you of this: my administration is committed to supporting you, as you pursue the knowledge that illuminates the world. Knowledge that will surely, ceaselessly continue to bring benefit to all mankind.

Thank you. God bless you. And God bless this great Academy.

# # #

(Lange/Cawley)
April 19, 1990
3:15 P.M.
[SCI.DOC]

PRESIDENTIAL ADDRESS: NATIONAL ACADEMY OF SCIENCES
WASHINGTON, D.C.
MONDAY, APRIL 23, 1990
2:00 P.M.

Thank you, Frank [Press]. Distinguished members of the National Academy, Dr. Press, Dr. Bromley, ladies and gentlemen: It's an honor to be with you today. The advice and counsel of this Academy has been crucial to American Presidents for well over a century. I'm proud to be the latest to thank you.

We stand at a moment of wondrous prosperity. But our wealth goes far beyond the merely material. Ours is an **intellectual** prosperity, unprecedented in history. For that, and the health and security it affords this nation and the world, gratitude is owed to the men and women who have committed their minds and lives to science.

Those devoted to such work -- its patient searching, its passionate struggles -- have engaged themselves in mankind's exalted mission ~~and the mind's manifest destiny.~~ the search for understanding.

President Abraham Lincoln established this great institution in the dark hours of our nation's greatest crisis -- ~~which~~ ~~testifies~~ to the enduring importance of scientific knowledge. ~~And~~ when this magnificent building was ~~finally~~ dedicated, Calvin Coolidge predicted "a new day in scientific research. A new sun is rising," he said.

And in the times to follow your academy has responded to urgent national needs in war and in peace — vivid testimony

He was right. The awesome scientific advances of this century, many of which you've brought about, bring us ever closer to understanding the universe, its origins, and our own. And science has told us a stranger and more wondrous story than myth might ever have written for us.

Fourscore and ten or twenty billion years ago, it all began. With a quantity of energy and mass unimaginably hot and dense, about the size of a baseball, containing everything that would become the universe, they say. And then, in one incomprehensibly powerful instant, energy and matter of every kind exploded in at least four dimensions. Or in a layman's terms, somebody hit that cosmic baseball right out of the park.

But while the pace of **universal** change may have begun with blinding speed and slowed down since, the pace of our **scientific** evolution has been accelerating rapidly. Growing in intensity throughout this century like a series of chain reactions in a critical mass of highly-trained American grey matter -- touching off revolutions in every direction.

Today, I want to outline the role this Administration is playing to fuel ~~those revolutions~~ the advance of science. Because as the pace of science accelerates, I believe that **government must keep pace -- and <u>will</u> keep pace.**

First, we've moved to better integrate science and technology into the policy process. My assistant for Science and Technology, Dr. Allan Bromley, is an active member of the Economic Policy Council, and chairs a White House Working Group

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It has told us about a universe 10 to 20 billion years old that originated in a quantity of mass no larger than a baseball. It has told us about a single molecule, the ribbon of DNA, that carries the genetic code of life. Science has made it possible to travel beyond the Earth's atmosphere and to unlock the secrets of matter and to cure diseases that once terrorized mankind. In the words of Louis Pasteur, science has become the "torch that illuminates the world."

Like most Americans, I don't claim to understand all of these things. But I know what they mean in terms of intellectual excitement, and national prestige, and the contribution to human knowledge. They mean the difference between leading and being left behind in a great human adventure.

INSERT B:

During my campaign I promised to make my science advisor an assistant to the President, and I've done that. Allan Bromley serves on the Economic Policy Council, the Domestic Policy Council, and the National Space Council, and he works closely with the National Security Council and the Competitiveness Council on matters involving science and technology. He chairs a working group on science and technology and another that is looking specifically at the complex subject of global change for the economic and domestic policy councils. I have also, for the first time, nominated, and the Senate has confirmed, all four of the Associate Directors called for in the legislation that established the Office of Science and Technology Policy.

I promised to create a President's Council of Advisors on Science and Technology, and in February we held our first meeting up at Camp David, with another meeting here in Washington last month. I'm committed to greater cross-fertilization with the private sector, on issues ranging from pure research to manufacturing performance. PCAST will help provide that advice, as will your own Academy. For example, we'll be looking to the Academy's new Manufacturing Forum, just established this month, for ways to turn around the competitive declines that have affected key U.S. industries.

We're also working to better integrate our science and technology efforts across the spectrum -- to get the biggest bang

for the federal buck. We're reinvigorating the Federal Coordinating Counsel for Science, Engineering, and Technology, which goes by the rather appropriate name of "fix-it." This administration is going to pull together and coordinate federal programs in such areas as education, computing, and high technology so that America remains at the forefront of science and technology.

The second major initiative this Administration is taking involves the budget. In January we sent a budget to Congress that includes a record $71 billion for research and development, and we intend to increase that funding in the years ahead. Investing in science and technology is one of the best investments we can make in our future. It's an investment in a stronger economy, a more secure nation, a better future for everyone.

Within that budget, we're increasing funding for basic research -- the historical wellspring of this nation's well-being. [Insert paragraphs 1, 2, 3, and 4 from pages 4, 6, and 7.]

The budget proposes to increase funding for the U.S. Global Change Research Program by 57 percent -- to over $1 billion -- so that we better understand the complex dynamics of the global environment. It increases funding to map and sequence the human genome, which will make it possible to treat incurable diseases and understand more about how living things develop. And it extends federal support of biotechnology, which could become one of the 21st century's biggest industries.

The budget proposes several initiatives that could improve the international competitiveness of American industry and our overall standard of living. That's the third area I wanted to discuss. We're proposing steps, such as developing advanced technologies and making the research and experimentation tax credit permanent, that have both public and private benefits. We're also working to lower the cost of capital and clear away regulatory burdens so that industry can make the investments in the future that this country needs.

Regarding technology, this administration is committed to working with industry to develop the generic, precompetitive technologies that support both economic competitiveness and our national security. These technologies do not give an advantage to any one company, but they help whole industries and economic sectors advance in the global marketplace. We need to find ways that American industry can better translate new ideas and technologies into marketable products. Many of these same technologies also support our national security, by giving us the technological edge that will be essential in a rapidly changing world.

Finally, I want to point out that none of the things I've been discussing will occur if this country does not produce the new generation of scientists and engineers needed to carry on your work, as well as to operate an increasingly technical society.

that advises the Domestic Policy Council. And we're already working to better integrate our science and technology efforts across the spectrum -- to get the "biggest bang" out of those big bucks.

But beyond the Federal role, we're committed to greater cross-fertilization with talent from the private sector -- on issues ranging from pure research to manufacturing performance.

So this year we created a President's Council of Science and Technology Advisors -- experts whose guidance has already been invaluable. We'll also be looking for counsel from this Academy's new Manufacturing Forum, just established this month.

We're committed to advancing America's tradition of innovation -- so our '91 budget called for a substantial increase in civilian research and development, and a permanent extension of the research and experimentation tax credit. But along with the applied, market-driven knowledge so crucial to this country's competitive future, let me reaffirm two priorities.

As a result, my administration is ~~First, math and science education -- where we're~~ engaged in a broad effort of reform and restructuring in cooperation with the states that began with our first-ever Education Summit with the nation's governors last fall. Our goal is to make American students first in the world in science and math achievement by the end of this century.

Insert C →

Today, I call on <u>all</u> Federal laboratories, facilities, and agencies to open their doors to students and teachers -- and get involved with education at the local level. And I ask our

INSERT C:

There are many things that must be done to achieve this goal. We must provide students with new incentives to study science and engineering, such as the National Science Scholars program that I have proposed. We must convince more women and minorities to study science. The budget proposes increasing federal funding for science, mathematics, and engineering education in five federal agencies by 26 percent, to a total of over $1 billion.

We must also work together -- the federal government and the scientific community -- to improve science, mathematics, and engineering education.

industrial and business communities to create new alliances for education, mobilizing more of this nation's great technical resources, for the sake of the future.

The second priority I'd reaffirm is **basic research** -- the historical wellspring of this nation's well-being. Science must be able to continue seeking answers to our most fundamental questions. But here, some vigilance is needed. Earlier this year, I proposed to double the National Science Foundation budget. **Today, I want to call on Congress: Put our money where our future is. Put the National Science Foundation budget back on track.**

Without strong science we are blind: unable to grasp the real parameters of the present, or real potential of the future. But with the past as prologue, we know that **the investments we make in science are some of mankind's most promising.**

Satellites already help us study the earth's natural systems and assess environmental threats. And combined with video cameras, they've become a potent force for peace -- both a product of science and a source of conscience -- **bringing the actions of nations before the eyes of the world.**

Pictures from Poland, scenes on the Berlin Wall... the eye of technology has proved more powerful than chisels for breaking down barriers -- etching the idea of freedom on the psyche of humanity -- and setting off a wondrous, hopeful, **political** chain reaction, worldwide.

INSERT D:

Education is important for another reason. We all know that science and technology have become more and more intertwined with our daily lives. But today science and technology are assuming an even broader role -- they are becoming forces for historical change.

INSERT E:

It is no accident that many of the individuals at the center of today's worldwide political revolutions share a vision of the future based on personal freedom, openness, and freedom of inquiry. These are values shared by our political system and by science alike.

They are also that values that have fueled this country's great economic expansion and now promise to bring equal prosperity to nations that are throwing off the shackles of central planning. We have always been a nation of tinkerers and inventors, and from our small laboratories and workshops have come the discoveries that have changed the world.

Molecular biology, already responsible for agricultural advances that help feed the world, is tackling the challenge and promise of mapping the genome [GEE-nome] -- breaking the code of human life that might allow us to isolate and conquer such diseases as A.I.D.S., and cancer.

And just this month -- while one group of scientists pulled strands of D.N.A. from a 17 million-year-old magnolia leaf buried at the bottom of an ancient lake in northern Utah -- another group in San Jose managed to see and manipulate single **atoms** under a new scanning microscope -- bringing us a step closer to the creation of man-made molecules, new generations of tailored materials with undreamed-of properties, and computers with inconceivable power.

[[Of course, I can't claim to comprehend all of this. Like many, I've gain my scientific understanding from those Gary Larson cartoons. Like the one where, after detailed calculations, Einstein discovers that Time is actually Money.]]

While this administration is convinced that science is a priority investment -- and we're **committed** to keeping pace with science, as partner and catalyst -- we will not attempt to direct the course of science, any more than we would dictate the work of art, music, or literature.

Now more than ever -- on issues ranging from climate change, to A.I.D.S. research, to genetic engineering, to food additives -- we rely on the objective perspective of science for guidance. And as the frontiers of knowledge are increasingly distant from

the understanding of the many, it is ever more important that we can turn to the few for straightforward advice.

The National Academy of Sciences is **renowned** for objectivity and immunity to partisan pressures. I am confident that the members of this body -- the most distinguished scientists in America -- will preserve the objectivity that has been the Academy's hallmark.

On this I know we agree -- because so many of our technical and scientific achievements have been the products of independent minds. And if the earth-moving events of 1989 reminded us of anything, it's that complex bureaucracies and centralized planning don't work well in the governance of societies. **We will not try to impose them on science.**

Just as entrepreneurs and small businesses fuel the growth of the American economy, the backbone of American science is its brilliant array of individual investigators, spread across the nation like a thousand points of enlightenment.

Among so many, think of two physicists who worked in secret because their firm wouldn't approve it, and discovered low-temperature superconductivity. Or Chester Carlson, who invented the Xerox machine in a little room behind a beauty parlor. Or Barbara McClintock, working alone, who made monumental discoveries in genetics 40 years ago that the world began to understand only in the last decade.

One of the **best** things government can do to support the magnificent creativity and energy of the American technical

community is to locate individual scientists with talent, and through agencies like ~~N.I.H., N.S.F., and others~~ the National Institutes of Health, the National Science Foundation, the Department of Defense, furnish them with the equivalent of venture capital. But there are **also** scientific challenges that, because of their unprecedented scope and importance, demand unusual support.

So we maintain a balanced commitment to projects like Space Station Freedom. And the new Supercollider -- so critical to retaining our scientific talent -- that will re-create the unimaginable fireball of our origins in miniature, allowing us to study matter that hasn't existed since the birth of the universe.

Leading-edge technologies often help us find what we aren't even looking for -- whether it's ~~breaking~~ mapping the genetic code of life, or getting a new look at the most ancient forms of light.

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Our space program is a leading example -- as is the Hubble telescope -- the ~~most~~ sophisticated celestial object mankind has ever tried to lift into the heavens, ~~with~~ the power to see to the ends of the universe, and back to the birth of time.

[[I understand it's half a <u>billion</u> times more sensitive than the human eye. Talk about the vision thing...]]

On the southwest grounds of this great Academy surrounded by a representation of the cosmos, rests a bronze memorial to a scientist who helped redefine mankind's understanding of time and space, of matter and energy. Among the engravings on that memorial are words of wonder -- about the "joy and amazement" Einstein felt, "at the beauty and grandeur of this world, of which man can just form a faint notion." Your work,

INSERT F:

Even as individual scientists continue to make breathtaking discoveries, some science and technology has grown larger than any one person, or even any one nation. Some scientific challenges, because of their unprecedented scope, and because they produce knowledge that benefits all mankind, demand international cooperation. Already, the European Space Agency, Japan, and Canada are making hardware contributions valued at more than $7 billion for Space Station Freedom. Combined with the total U.S. investment of about $16 billion, this will be the largest international R&D project ever undertaken. We are exploring new ways to encourage international cooperation on other big science projects, like the Superconducting Super Collider, mapping the human genome, and global change research.

International cooperation has also been a big part of one of the most exciting scientific projects of our time. Tomorrow morning the Space Shuttle is scheduled to lift the Hubble space telescope into orbit -- the most sophisticated celestial object that mankind has ever built, with the power to see to the ends of the universe, and back to the birth of time. Some have compared the views we'll get from the space telescope with the first views Galileo had of the heavens when he raised his homemade telescope toward the sky.

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Still, if Nature were a goddess, she would be a clever and imaginative ~~one~~, with an endlessly amusing habit of resting just beyond anticipation... ~~but~~ not quite beyond the reach of imagination.

We count on you to ask the questions ~~that~~ confound us -- and to struggle, that solutions might not manage forever to evade us. Because for those whose hearts are as open as their minds, ~~the~~ answers will surely, ceaselessly, enlighten and amaze us.

Thank you. And God bless you.

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Einstein wrote something else that I think is important. In a letter to a friend, he wrote that "The pursuit of scientific truth, detached from the practical interests of everyday life, ought to be treated as sacred by every government. . . ." Einstein was right, and my administration is committed to supporting you as you pursue the knowledge that, surely, ceaselessly, will enlighten and amaze us.

(Lange/Cawley)
April 19, 1990
3:15 P.M.
[SCI.DOC]

PRESIDENTIAL ADDRESS: NATIONAL ACADEMY OF SCIENCES
WASHINGTON, D.C.
MONDAY, APRIL 23, 1990
2:00 P.M.

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As a result, my administration is ~~First, **math and science education** -- where we're~~ engaged in a broad effort of reform and restructuring in cooperation with the states that began with our first-ever Education Summit with the nation's governors last fall. Our goal is to make American students first in the world in science and math achievement by the end of this century.

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Today, I call on <u>all</u> Federal laboratories, facilities, and agencies to open their doors to students and teachers -- and get involved with education at the local level. And I ask our

industrial and business communities to create new alliances for education, mobilizing more of this nation's great technical resources, for the sake of the future.

A1

~~The second priority I'd reaffirm is **basic research** -- the historical wellspring of this nation's well-being.~~ Science must be able to continue seeking answers to our most fundamental questions. ~~But here, some vigilance is needed.~~ Earlier this year, I proposed to double the National Science Foundation budget. **Today, I want to call on Congress: Put our money where our future is. Put the National Science Foundation budget back on track.**

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Pictures from Poland, scenes on the Berlin Wall... the eye of technology has proved more powerful than chisels for breaking down barriers -- etching the idea of freedom on the psyche of humanity -- and setting off a wondrous, hopeful, **political** chain reaction, worldwide.

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It is no accident that many of the individuals at the center of today's worldwide political revolutions share a vision of the future based on personal freedom, openness, and freedom of inquiry. These are values shared by our political system and by science alike.

They are also that values that have fueled this country's great economic expansion and now promise to bring equal prosperity to nations that are throwing off the shackles of central planning. We have always been a nation of tinkerers and inventors, and from our small laboratories and workshops have come the discoveries that have changed the world.

Molecular biology, already responsible for agricultural advances that help feed the world, is tackling the challenge and promise of mapping the genome [GEE-nome] -- breaking the code of human life that might allow us to isolate and conquer such diseases as A.I.D.S., and cancer.

Move to next page

And just this month -- while one group of scientists pulled strands of D.N.A. from a 17 million-year-old magnolia leaf buried at the bottom of an ancient lake in northern Utah -- another group in San Jose managed to see and manipulate single **atoms** under a new scanning microscope -- bringing us a step closer to the creation of man-made molecules, new generations of tailored materials with undreamed-of properties, and computers with inconceivable power.

[[Of course, I can't claim to comprehend all of this. Like many, I've gain my scientific understanding from those Gary Larson cartoons. Like the one where, after detailed calculations, Einstein discovers that Time is actually Money.]]

Insert E

This line of thought will confuse the members.

While this administration is convinced that science is a priority investment -- and we're **committed** to keeping pace with science, as partner and catalyst -- we will not attempt to <u>direct</u> the course of science, any more than we would dictate the work of art, music, or literature.

Now more than ever -- on issues ranging from climate change, to A.I.D.S. research, to genetic engineering, to food additives -- we rely on the objective perspective of science for guidance. And as the frontiers of knowledge are increasingly distant from

the understanding of the many, it is ever more important that we can turn to the few for straightforward advice.

The National Academy of Sciences is **renowned** for objectivity and immunity to partisan pressures. So it is essential that the members of this body -- the most distinguished scientists in America -- preserve the objectivity that has been the Academy's hallmark.

On this I know we agree -- because so many of our technical and scientific achievements have been the products of independent minds. And if the earth-moving events of 1989 reminded us of anything, it's that complex bureaucracies and centralized planning don't work well in the governance of societies. **We will not try to impose them on science.**

Just as entrepreneurs and small businesses fuel the growth of the American economy, the backbone of American science is its brilliant array of individual investigators, spread across the nation, well, like a thousand points of enlightenment.

~~Among so many, think of~~ two physicists ~~who~~ worked ~~in~~ secret because their firm wouldn't approve it, ~~and~~ discovered ~~low~~-temperature superconductivity. ~~Or~~ Chester Carlson, who invented the Xerox machine in a little room behind a beauty parlor. Or Barbara McClintock, working alone, who made monumental discoveries in genetics 40 years ago that the world began to understand only in the last decade.

One of the **best** things government can do to support the magnificent creativity and energy of the American technical

community is to locate individual scientists with talent, and through agencies like ~~N.I.H., N.S.F., and others~~ the National Institutes of Health, the National Science Foundation, the Department of Defense, furnish them with the equivalent of venture capital. But there are **also** scientific challenges that, because of their unprecedented scope and importance, demand unusual support.

So we maintain a balanced commitment to projects like Space Station Freedom. And the new Supercollider -- so critical to retaining our scientific talent -- that will re-create the unimaginable fireball of our origins in miniature, allowing us to study matter that hasn't existed since the birth of the universe.

~~Leading-edge~~ technologies often help us find what we aren't even looking for -- whether it's breaking ~~the~~ genetic code of life, or getting a new look at the most ancient forms of light.

Insert F

Our space program is a leading example -- as is the Hubble telescope -- the ~~most~~ sophisticated celestial object mankind has ever tried to lift into the heavens, ~~with~~ the power to see to the ends of the universe, and back to the birth of time.

[[I understand it's half a billion times more sensitive than the human eye. Talk about the vision thing...]]

On the southwest grounds of this great Academy surrounded by a representation of the cosmos, rests a bronze memorial to a scientist who helped redefine mankind's understanding of time and space, of matter and energy. Among the engravings on that memorial are words of wonder -- about the "joy and amazement" Einstein felt, "at the beauty and grandeur of this world, of which man can just form a faint notion." Your work,

the work of science, daily brings that beauty and grandeur into sharper focus.

Insert G

Still, if Nature were a goddess, she would be a clever and imaginative one, with an endlessly amusing habit of resting just beyond anticipation... but not quite beyond the reach of imagination.

We count on you to ask the questions that confound us -- and to struggle, that solutions might not manage forever to evade us. Because for those whose hearts are as open as their minds, the answers will surely, ceaselessly, enlighten and amaze us.

Thank you. And God bless you.

# # #

INSERT G:

Einstein wrote something else that I think is important. In a letter to a friend, he wrote that "The pursuit of scientific truth, detached from the practical interests of everyday life, ought to be treated as sacred by every government. . . ." Einstein was right, and my administration is committed to supporting you as you pursue the knowledge that, surely, ceaselessly, will enlighten and amaze us.

THE WHITE HOUSE

WASHINGTON

INSERT: (PAGE 3)

Therefore, I am charging our Federal research complex with a new mission. Starting today, all Federal laboratories, facilities and agencies must open their doors to students and teachers -- and become the world's greatest scientific instrument for education. Through the Departments of Education, Energy, Interior and others, the National Science Foundation and NASA, we are already reaching thousands of youngsters. Through this new effort we should reach thousands more. We must bring greater numbers of women and minorities into science and technology careers. I look to my Domestic Policy Council and to the Federal Coordinating Council on Science, Engineering and Technology to coordinate this new initiative. And I ask our . . .

Porter

that advises the Domestic Policy Council. And we're already working to better integrate our science and technology efforts across the spectrum -- to get the "biggest bang" out of those big bucks.

But beyond the Federal role, we're committed to greater cross-fertilization with talent from the private sector -- on issues ranging from pure research to manufacturing performance.

So this year we created a President's Council of Science and Technology Advisors -- experts whose guidance has already been invaluable. We'll also be looking for counsel from this Academy's new Manufacturing Forum, just established this month.

We're committed to advancing America's tradition of innovation -- so our '91 budget called for a substantial increase in civilian research and development, and a permanent extension of the research and experimentation tax credit. But along with the applied, market-driven knowledge so crucial to this country's competitive future, let me reaffirm two priorities.

First, **math and science education** -- where we're engaged in a broad effort of reform and restructuring in cooperation with the states that began with our first-ever Education Summit with the nation's governors last fall. Our goal is to make American students first in the world in science and math achievement by the end of this century.

WE ARE OPENING THE DOORS OF
~~Today, I call on all~~ Federal laboratories, facilities, and agencies ~~to open their doors~~ to students and teachers. I and MANY FEDERAL APPOINTEES ~~get involved~~ with education at the local level. And I ask our

AND CIVIL SERVANTS ARE ACTIVELY ASSISTING

(Lange/Cawley)
April 23, 1990
11:57 A.M.
[SCI.DOC]

PRESIDENTIAL ADDRESS: NATIONAL ACADEMY OF SCIENCES
WASHINGTON, D.C.
MONDAY, APRIL 23, 1990
2:00 P.M.

Distinguished members of the National Academy, Dr. Press, Dr. Ebert, Dr. Raven, Dr. Gordon, Dr. Blout, Dr. Bromley; Admirals Watkins and Truly ; ladies and gentlemen: It's an honor to be with you today. The advice and counsel of this Academy has been crucial to American Presidents for well over a century. I'm proud to be the latest to thank you.

We stand at a moment of wondrous prosperity. But our wealth goes far beyond the merely material. Ours is an **intellectual** prosperity, unprecedented in history. For that, and the health and security it affords this nation and the world, gratitude is owed to the men and women who have committed their minds and lives to science.

Those devoted to such work -- its patient searching, its passionate struggles -- have engaged themselves in mankind's most exalted mission, and the mind's manifest destiny: the search for understanding.

President Abraham Lincoln established this great institution in the dark hours of our nation's greatest crisis -- which testifies to the enduring importance of scientific knowledge. In the years that followed your academy has responded to urgent national needs in times of war and peace.

When this magnificent building was dedicated, Calvin Coolidge predicted "a new day in scientific research. A new sun is rising," he said. He was right. The awesome scientific advances of this century, many of which you've brought about, bring us ever closer to understanding the universe, its origins, and our own. And science has told us a stranger and more wondrous story than myth might ever have written for us.

Fourscore and ten or twenty billion years ago, the theory goes, it all began -- with a universe of energy and mass unimaginably hot and compressed, containing everything that would become what we now see in the heavens. And then, science tells us -- in one incomprehensibly powerful instant -- energy and matter of every kind exploded in every direction. [[Or as a layman might explain it, somebody hit that cosmic baseball right out of the park.]]

But while the pace of **cosmic** change may have begun with blinding speed and slowed down since, the pace of our **scientific** evolution has been accelerating rapidly. Growing in intensity like a series of chain reactions in a critical mass of highly-trained American grey matter -- touching off scientific and technical revolutions in every direction.

Today, I want to outline the role this Administration is playing to advance those revolutions. Because as the pace of science accelerates, I believe that **government must keep pace -- and <u>will</u> keep pace.**

First, we've moved to better integrate science and technology into the policy process. We have created an Interagency Working Group that will more closely link science and technology considerations with the policy-making process of the Economic and Domestic Policy Councils.

My Assistant for Science and Technology, Dr. Allan Bromley, chairs this working group and participates in those Councils, advising them on matters related to science and technology -- as well as serving on the National Space Council.

And we're also committed to greater cross-fertilization with talent from the private sector -- on issues ranging from pure research to manufacturing performance. So this year we created a President's Council of Advisors on Science and Technology -- experts whose guidance I value and depend on. We'll also be looking for counsel from this Academy's new Manufacturing Forum, just announced this month.

We want to advance America's tradition of innovation -- and we intend to get the biggest bang \\ for the Federal buck. This administration has also taken steps to reinvigorate the Federal Coordinating Council for Science, Engineering and Technology -- in order to assure that the Federal investments in R & D programs are closely integrated across agency boundaries.

In January, we sent a budget to Congress that includes a **record $71 billion for research and development** -- an investment in a stronger economy, a more secure nation, and a brighter future. Our administration <u>is</u> committed to investing in the

future -- it's evident in the policies we're creating, and the budget we're calling for -- with everything from the 24 percent increase for NASA, to our support of a major agricultural research initiative.

To improve the international competitiveness of American industry, and our overall standard of living, we've called for a permanent extension of the research and experimentation tax credit. And we're working to lower the cost of capital and clear away regulatory burdens, so that industry can make the kinds of investments the future demands.

Along with the applied, market-driven knowledge so crucial to this country's competitive future, let me reaffirm two other priorities:

First, **math and science education.** We understand that only with a new generation of scientists and engineers will your work, and America's preeminence, be assured. So we're engaged in a broad initiative of reform and restructuring, in cooperation with the states. It is an effort that began with our first-ever Education Summit with the nation's governors last fall. Our goal is to make American students first in the world in science and math achievement by the end of this century -- and to convince more women and minorities to study science.

We're providing a number of new incentives for students, like the National Science Scholars program I've proposed. We're opening the doors of Federal laboratories, facilities, and agencies to students and teachers. Our budget increases funding

by **26 percent** to **over one billion dollars** for science, math, and engineering education -- through the Departments of Education, Energy, Interior and others, as well as the National Science Foundation and NASA.

Today I ask our industrial and business communities to create new alliances for education, mobilizing more of this nation's great technical resources, for the sake of the future. We are committed to ensuring that **America has the brainpower to remain at the forefront.**

A second priority of this administration is **basic research** -- the historical wellspring of this nation's well-being. Science must be able to continue seeking answers to our most fundamental questions.

For such reasons our budget calls for increasing funding for the U.S. Global Change Research Program by 57 percent -- to over one billion dollars. And earlier this year, I reiterated my commitment to double the National Science Foundation budget by 1993. **Today, I want to call on Congress: Put our money where our future is. Put an increased National Science Foundation budget back on track.**

Today, science and technology are assuming a broader and more interrelated role in human life than ever before. They are becoming forces for historical change.

Satellites already help us study the earth's natural systems and assess environmental threats -- and the Mission to Planet Earth will further our work of global stewardship.

But this past year, in the Revolution of '89, we have also seen communications satellites, along with video cameras, VCR's and FAX machines, becoming a potent force for peace -- both a product of science and a source of conscience -- **bringing the actions of nations before the eyes of the world.**

Pictures from Poland and South Africa, scenes on the Berlin Wall... the eye of technology has proved more powerful than chisels for breaking down barriers -- etching the idea of freedom on the psyche of humanity -- and setting off a wondrous, hopeful, **political** chain reaction, worldwide.

It's no accident that many of the individuals at the center of today's worldwide political revolutions share a vision of the future based on personal freedom, openness, and freedom of inquiry. These values are shared by our political system and by science alike. Science, like any field of endeavor, relies on freedom of inquiry. And one of the hallmarks of that freedom is objectivity.

Now more than ever -- on issues ranging from climate change, to A.I.D.S. research, to genetic engineering, to food additives -- government relies on the impartial perspective of science for guidance. And as the frontiers of knowledge are increasingly distant from the understanding of the <u>many</u>, it is ever more important that we can turn to the <u>few</u> for straightforward advice.

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for well over a century. So I am confident that the members of this body -- the most distinguished scientists in America -- will continue the tradition that has been the Academy's hallmark.

On this I know we agree -- because so many of our technical and scientific achievements have been the products of independent minds. And if the earth-moving events of 1989 reminded us of anything, it's that complex bureaucracies and centralized planning don't work well in the governance of societies. **We will not try to impose them on science.**

Just as entrepreneurs and small businesses fuel the growth of the American economy, the backbone of American science is its brilliant array of individual investigators, spread across the nation.

Among so many, think of Chester Carlson, who invented the photocopy machine in a little room over a Long Island pub. Or Barbara McClintock, working alone, who made monumental discoveries in genetics nearly 50 years ago that the world began to understand only in the last decade.

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furnish them with adequate resources and state-of-the-art instrumentation -- through agencies like the National Institutes of Health, the National Science Foundation, the Departments of Defense and Energy, and others -- to help these investigators make progress.

But there are **also** scientific challenges that, because of their unprecedented scope and importance, demand unusual support -- and international cooperation. Already, the European Space Agency, Japan, and Canada are making hardware contributions valued at more than seven billion dollars for **Space Station Freedom** -- a key component of our Space Exploration Initiative. Combined with our total investment of about 19 billion dollars, Space Station Freedom will be the largest international R & D project ever undertaken.

We're exploring new ways to encourage international cooperation on other big science projects -- like mapping the human genome [GEE-nome], global change research, and the Superconducting Super Collider -- a technological giant that will recreate the fireball of our origins, and allow us to study forms of matter that haven't existed since the birth of the universe.

There's a vote coming up in Congress this week on that Super Collider -- so I'd like to call on the members to support that project, as well as our NASA budget. Only by doing so will we keep America on the leading edge of advancing human knowledge, and pushing the limits of space exploration.

Tomorrow morning, the Space Shuttle is scheduled to lift into the heavens the most sophisticated celestial object that mankind has ever built -- the Hubble Telescope -- with the power to see to the ends of the universe, and back to the birth of time. [[I understand it's half a billion times more sensitive than the human eye. Talk about the vision thing...]]

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As President I can assure you of this: my administration is committed to supporting you, as you pursue the knowledge that illuminates the world. Knowledge that will surely, ceaselessly continue to bring benefit to all mankind.

Thank you. God bless you. And God bless this great Academy.

# # #

(Lange/Cawley)
April 23, 1990
9:50 A.M.
[SCI.DOC]

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WASHINGTON, D.C.
MONDAY, APRIL 23, 1990
2:00 P.M.

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# # #

Final to CWTJC 4pm

Document No. 134261

WHITE HOUSE STAFFING MEMORANDUM

DATE: 04/19/90 **ACTION/CONCURRENCE/COMMENT DUE BY:** 2:00p.m. 04/20

SUBJECT: PRESIDENTIAL REMARKS: NATIONAL ACADEMY OF SCIENCES (04/19 3:15p.m. draft)

	ACTION	FYI		ACTION	FYI
VICE PRESIDENT	☐	☑	MCCLURE	☑	☐
SUNUNU	☐	☑	NEWMAN	☐	☐
SCOWCROFT	☑	☐	PORTER	☑	☐
DARMAN	☑	☐	ROGICH	☑	☐
BATES	☑	☐	UNTERMEYER	☑	☐
CARD	☐	☑	ROGERS	☐	☑
CICCONI	☐	☑	PINKERTON	☑	☐
DEMAREST	☑	☐	WINSTON	☐	☑
FITZWATER	☐	☑	BROMLEY	☑	☐
GRAY	☑	☐	_____	☐	☐
HAGIN	☐	☐	_____	☐	☐

REMARKS:

Please provide any comments/recommendations directly to Chriss Winston by 2:00 p.m. on Friday 04/20, with a copy to my office. Thanks.

RESPONSE:

See Comments
4-20-90
Holly Williamson

James W. Cicconi
Assistant to the President
and Deputy to the Chief of Staff
Ext. 2702

(Lange/Cawley)
April 19, 1990
3:15 P.M.
[SCI.DOC]

PRESIDENTIAL ADDRESS: NATIONAL ACADEMY OF SCIENCES
WASHINGTON, D.C.
MONDAY, APRIL 23, 1990
2:00 P.M.

Thank you, Frank [Press]. Distinguished members of the National Academy, Dr. Press, Dr. Bromley, ladies and gentlemen: It's an honor to be with you today. The advice and counsel of this Academy has been crucial to American Presidents for well over a century. I'm proud to be the latest to thank you.

We stand at a moment of wondrous prosperity. But our wealth goes far beyond the merely material. Ours is an **intellectual** prosperity, unprecedented in history. For that, and the health and security it affords this nation and the world, gratitude is owed to the men and women who have committed their minds and lives to science.

Those devoted to such work -- its patient searching, its passionate struggles -- have engaged themselves in mankind's exalted mission, and the mind's manifest destiny: the search for understanding.

See DOE/energy comment #1

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He was right. The awesome scientific advances of this century, many of which you've brought about, bring us ever closer to understanding the universe, its origins, and our own. And science has told us a stranger and more wondrous story than myth might ever have written for us.

Fourscore and ten or twenty billion years ago, it all began. With a quantity of energy and mass unimaginably hot and dense, about the size of a baseball, containing everything that would become the universe, they say. And then, in one incomprehensibly powerful instant, energy and matter of every kind exploded in at least four dimensions. Or in a layman's terms, somebody hit that cosmic baseball right out of the park.

But while the pace of **universal** change may have begun with blinding speed and slowed down since, the pace of our **scientific** evolution has been accelerating rapidly. Growing in intensity throughout this century like a series of chain reactions in a critical mass of highly-trained American grey matter -- touching off revolutions in every direction.

Today, I want to outline the role this Administration is playing to fuel those revolutions. Because as the pace of science accelerates, I believe that **government must keep pace -- and <u>will</u> keep pace -- with science.**

First, we've moved to better integrate science and technology into the policy process. My assistant for Science and Technology, Dr. Allan Bromley, is an active member of the * Economic and Domestic Policy Councils, and has recently been appointed to chairs a White House Working Group

(See Steve Danzansky's Note to you.)
- next page -

THE WHITE HOUSE
WASHINGTON

Date: 4-20-90

TO: CHRIS WINSTON

FROM: STEPHEN I. DANZANSKY
Deputy Assistant to the President
and Director of Cabinet Affairs

Per our conversation, these are the changes in the National Academy of Science speech that Allan Bromley and I had agreed would be incorporated into a Presidential speech. Jim Cicconi had suggested such a vehicle to settle another problem, and I feel certain he would not object to this formulation.

The changes I have made to the draft more accurately reflect the bureaucratic reality.

Thanks for your help on this.

cc: Jim Cicconi

Chris - these changes are reflected in our master copy of all comments.
Thanks - Holly W.

He was right. The awesome scientific advances of this century, many of which you've brought about, bring us ever closer to understanding the universe, its origins, and our own. And science has told us a stranger and more wondrous story than myth might ever have written for us.

Fourscore and ten or twenty billion years ago, it all began. With a quantity of energy and mass unimaginably hot and dense, about the size of a baseball, containing everything that would become the universe, they say. And then, in one incomprehensibly powerful instant, energy and matter of every kind exploded in at least four dimensions. Or in a layman's terms, somebody hit that cosmic baseball right out of the park.

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that ~~advises~~ the Domestic Policy Council. And we're already working to better integrate our science and technology efforts across the spectrum -- to get the "biggest bang" out of those big bucks.

But beyond the Federal role, we're committed to greater cross-fertilization with talent from the private sector -- on issues ranging from pure research to manufacturing performance.

So this year we created a President's Council of Science and Technology Advisors -- experts whose guidance has already been invaluable. We'll also be looking for counsel from this Academy's new Manufacturing Forum, just established this month.

We're committed to advancing America's tradition of innovation -- so our '91 budget called for a substantial increase in civilian research and development, and a permanent extension of the research and experimentation tax credit. But along with the applied, market-driven knowledge so crucial to this country's competitive future, let me reaffirm two priorities.

First, **math and science education** -- where we're engaged in a broad effort of reform and restructuring in cooperation with the states that began with our first-ever Education Summit with the nation's governors last fall. Our goal is to make American students first in the world in science and math achievement by the end of this century.

Today, I call on <u>all</u> Federal laboratories, facilities, and agencies to open their doors to students and teachers -- and get involved with education at the local level. And I ask our

presents Science + Technology advice and policy options to
that ~~advises~~ the Domestic Policy Council and Economic, And we're already through both
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See insert (next page)
DPC feels strongly about this as does Energy. Please call us

industrial and business communities to create new alliances for education, mobilizing more of this nation's great technical resources, for the sake of the future.

The second priority I'd reaffirm is **basic research** -- the historical wellspring of this nation's well-being. Science must be able to continue seeking answers to our most fundamental questions. But here, some vigilance is needed. Earlier this year, I proposed to double the National Science Foundation budget. **Today, I want to call on Congress: Put our money where our future is. Put the National Science Foundation budget back on track.**

Without strong science we are blind: unable to grasp the real parameters of the present, or real potential of the future. But with the past as prologue, we know that **the investments we make in science are some of mankind's most promising.**

Satellites already help us study the earth's natural systems and assess environmental threats. And combined with video cameras they've become a potent force for peace -- both a product of science and a source of conscience -- **bringing the actions of nations before the eyes of the world.**

Pictures from Poland, scenes on the Berlin Wall... the eye of technology has proved more powerful than chisels for breaking down barriers -- etching the idea of freedom on the psyche of humanity -- and setting off a wondrous, hopeful, **political** chain reaction, worldwide.

See Energy comments #4

Molecular biology, already responsible for agricultural advances that help feed the world, is tackling the challenge and promise of mapping the genome [GEE-nome] -- breaking the code of human life that might allow us to isolate and conquer such diseases as A.I.D.S., and cancer.

See Energy comments #5

And just this month -- while one group of scientists pulled strands of D.N.A. from a 17 million-year-old magnolia leaf buried at the bottom of an ancient lake in northern Utah -- another group in San Jose managed to see and manipulate single **atoms** under a new scanning microscope -- bringing us a step closer to the creation of man-made molecules, new generations of tailored materials with undreamed-of properties, and computers with inconceivable power.

[[Of course, I can't claim to comprehend all of this. Like many, I've gain my scientific understanding from those Gary Larson cartoons. Like the one where, after detailed calculations, Einstein discovers that Time is actually Money.]]

DOE Education Humorous yet portrays the "nerd" image of scientists and other technical people

See Energy comments #6

While this administration is convinced that science is a priority investment -- and we're **committed** to keeping pace with science, as partner and catalyst -- we will not attempt to <u>direct</u> the course of science, any more than we would dictate the work of art, music, or literature.

Now more than ever -- on issues ranging from climate change, to A.I.D.S. research, to genetic engineering, to food additives -- we rely on the objective perspective of science for guidance. And as the frontiers of knowledge are increasingly distant from

the understanding of the many, it is ever more important that we can turn to the few for straightforward advice.

The National Academy of Sciences is renowned for objectivity and immunity to partisan pressures. So it is essential that the members of this body -- the most distinguished scientists in America -- preserve the objectivity that has been the Academy's hallmark.

On this I know we agree -- because so many of our technical and scientific achievements have been the products of independent minds. And if the earth-moving events of 1989 reminded us of anything, it's that complex bureaucracies and centralized planning don't work well in the governance of societies. We will not try to impose them on science.

Just as entrepreneurs and small businesses fuel the growth of the American economy, the backbone of American science is its brilliant array of individual investigators, spread across the nation, well, like a thousand points of enlightenment.

(see Ners') comments #7

Among so many, think of two physicists who worked in secret because their firm wouldn't approve it, and discovered ~~low~~ high temperature superconductivity. Or Chester Carlson, who invented the Xerox machine in a little room behind a beauty parlor. Or Barbara McClintock, working alone, who made monumental discoveries in genetics 40 years ago that the world began to understand only in the last decade.

One of the best things government can do to support the magnificent creativity and energy of the American technical

community is to locate individual scientists with talent, and through agencies like N.I.H., N.S.F., and others, furnish them with the equivalent of venture capital. But there are also scientific challenges that, because of their unprecedented scope, demand unusual support.

So we maintain a balanced commitment to projects like Space Station Freedom. And the new Supercollider -- so critical to retaining our scientific talent -- that will re-create the unimaginable fireball of our origins in miniature, allowing us to study matter that hasn't existed since the birth of the universe.

Leading-edge technologies often help us find what we aren't even looking for -- whether it's breaking the genetic code of life, or getting a new look at the most ancient forms of light.

Our space program is a leading example -- as is the Hubble telescope -- the most sophisticated celestial object mankind has ever tried to lift into the heavens, with the power to see to the ends of the universe, and back to the birth of time.

[[I understand it's half a billion times more sensitive than the human eye. Talk about the vision thing...]]

On the southwest grounds of this great Academy rests a bronze memorial to a scientist who helped redefine mankind's understanding of time and space, of matter and energy. Among the engravings on that memorial are words of wonder -- about the "joy and amazement" Einstein felt, "at the beauty and grandeur of this world, of which man can just form a faint notion." Your work,

the work of science, daily brings that beauty and grandeur into sharper focus.

Still, if Nature were a goddess, she would be a clever and imaginative one, with an endlessly amusing habit of resting just beyond anticipation... but not quite beyond the reach of imagination.

We count on you to ask the questions that confound us -- and to struggle, that solutions might not manage forever to evade us. Because for those whose hearts are as open as their minds, the answers will surely, ceaselessly, enlighten and amaze us.

Thank you. And God bless you.

# # #

Presidential Address to National Academy of Sciences
Comments from the Department of Energy

p. 1, para. 4: The other President worth mentioning here is Woodrow Wilson, who established the National Academy of Sciences' operating arm--the National Research Council--in 1918. This Research Council allows scientists nationwide to participate in the Academy's mission of advising the U.S. government, and is an institution unique among Academies of Science worldwide.

#1

Suggested sentence, to follow "importance of scientific knowledge." in the text: *"After the Academy organized our scientific efforts to win the First World War, President Wilson perpetuated your National Research Council--a source of impartial scientific advice without parallel in the world."*

p. 3, para. 5 Not strong enough. Need words "new mission." Point of business alliances is that they are with Federal agencies. This President has got to talk about volunteerism and about women and minorities. Must credit NASA and DOE leadership.

#2 reworked - see inserted page (after p. 3)

"Therefore, I am charging our Federal research complex with a new mission. Starting today, all laboratories, facilities and agencies must open their doors to students and teachers -- and become the world's greatest scientific instrument for education.

The rest of the Federal government must follow the lead of NASA and the Department of Energy and send our scientists and engineers into the community as volunteer teachers. We must bring greater numbers of women and minorities into science and technology careers. And we must work in tandem with the States the education communities and with business and industry to create new alliances for education, mobilizing more of this nation's great technical resources, for the sake of our future."

p. 4, para. 3-4: Two ideas are coupled here that don't belong with each other. Satellites do help us study the earth. But the only country that releases video images of newsworthy events taken from satellites is France (the SPOT satellite). At the current time, the U.S. government does not do so, presumably because such images would compromise our intelligence capabilities. Suggest that you refocus these two paragraphs on the Administration's initiative in the FY 91 budget on "Mission to Planet Earth" and the President's theme of "Global Stewardship."

#3

Suggested sentences to replace paragraphs beginning "Satellites already..." and "Pictures from Poland..." in the text: *"Satellites already help us study the earth's natural systems*

and assess environmental threats. With strong input from the scientific community, my Administration has put together a comprehensive plan for a 'Mission to Planet Earth.' This initiative will use satellites to acquire the kind of simultaneous data, on a global scale, that will take us to a new level of sophistication in our understanding of the earth as an integrated system. My vision of 'Global Stewardship' is crucially dependent on the knowledge and insights that will come from the earth, atmospheric, and environmental sciences."

p. 5, para. 1: Most of the big advances in agriculture have come from "old-fashioned" genetics and cross-breeding, not molecular biology. There are a lot of geneticists in the Academy who will perceive the first sentence in this paragraph as inaccurate. What molecular biology has done recently is revolutionize the production of pharmaceuticals (e.g., insulin, interferon, TPA) and medical diagnostics. You should emphasize this.

#4

Suggested phrase to replace "~~already responsible for agricultural advances that help feed the world~~" in the text: *"which has revolutionized medical diagnosis and the production of pharmaceuticals".*

Also, suggest you change "isolate and conquer" to *"understand and conquer".* We've already isolated the HIV virus that causes AIDS, and cancer is caused by a multiplicity of agents--not by a bacterium or virus to be isolated.

p. 5, para. 2: "Man-made molecules" are a dime a dozen. Nylon and many commodity chemicals would qualify in this category. This sentence reads better and is more accurate without such a reference.

#5

Suggest changing the end of the paragraph to read *"--bringing us a step closer to new generations of tailored materials with undreamed-of properties; materials that can be used, for example, to create computers with inconceivable power."*

p. 5, para. 4: The reference to not "directing" the course of science may seem odd to your audience. From their perspective, the Administration directs the course of science in each fiscal year's budget that establishes, for example, how much the NSF Division of Physics gets as compared to how much the NSF Division of Chemistry gets. The point that you want to make, it seems, is better stated in paragraph 2 of page 6 ("complex bureaucracies and centralized planning"). So it's not really needed here, and the paragraph would be stronger without this reference.

#6

Seems to be addressing the NEA controversy
Why do it? (DPC)

Suggest deleting the last phrase of paragraph, beginning with "we will not attempt..." and removing the first word of the sentence, "While."

p. 6, para. 4: The reference to "who worked in secret because their firm wouldn't approve it" is dead wrong, and a potential embarrassment coming from the President. The two scientists (both of whom, by the way, are Foreign Associates of the National Academy of Sciences) were IBM Fellows, a position in IBM that explicitly permits incumbents the freedom to pursue independent projects. We should ~~be praising this sort of far-~~ sighted research management in industry, not damning IBM for it. And they discovered "high-temperature superconductivity."

#7

Suggest replacing the first sentence with *"Among so many, think of two Foreign Associates of this Academy--[Gerd] Binnig and [Heinrich] Rohrer--who debunked conventional wisdom with their discovery of high-temperature superconductivity in ceramic materials."*

p. 7, para. 1: In line 2, DOE deserves mention with NIH and NSF--our research and development budget is three times that of NSF.

#8

p. 7, para. 1: The reference to "venture capital" is likely to strike the audience as advocating stingy funding of single-investigator science. A major issue for scientists is the fact that packages of support from individual agencies are too small to conduct work efficiently, so they must write multiple grant proposals to fund a single project. While the President can't solve this problem in his speech the following replacement wording will make a better impression before he gets into the part of the speech on "big science."

#9 over reaction by Energy (DPC)

Suggest replacing end of first sentence on page, after "and others," with the following text: *"and others, furnish them with adequate resources--including state-of-the-art instrumentation--to make optimal progress."*

p. 7, para. 2: The sentence about the Supercollider needs brushing up. The parenthetical comment is overbroad and likely to draw fire. A more accurate sentence would be:

#10

"And the new Supercollider--so critical to understanding the origin of mass--that will recreate the unimaginable fireball of our origins in miniature, allowing us to study matter at energy levels that haven't existed since the birth of the universe."