Originally Processed With FOIA(s):
S

FOIA Number:
S

FOIA MARKER

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

Record Group/Collection: George H.W. Bush Presidential Records
Collection/Office of Origin: Speechwriting, White House Office of
Series: Speech File Backup Files
Subseries: Chron File, 1989-1993

OA/ID Number: 13748
Folder ID Number: 13748-005

Folder Title:
Westinghouse Science Awards Banquet 3/4/91 [OA 68561 [1]

Stack:	Row:	Section:	Shelf:	Position:
G	26	21	3	1

To Card

(Smith/Cawley)
February 25, 1991
9 A.M.
WEST

PRESIDENTIAL REMARKS: WESTINGHOUSE ADDRESS
WASHINGTON HILTON HOTEL
MONDAY, MARCH 4, 1991
7:00 P.M.

Secretary Sullivan, Governor and Mrs. Sununu, Dr. Bromley. Dr. Seaborg, Mr. Lego [Leg-go], Mr. Sherburne, Ms. Luszcz [Loosh], Monsignor Quinn, Mr. Flatow [flay-toe], Trustees of the Westinghouse Foundation, past and current Westinghouse Award recipients, judges of the Science Talent Search, distinguished guests of science, ladies and gentlemen. /

Thank you, Mr. Lego, for that introduction, and for your warm reception. And let me welcome to Washington the trustees of our posterity. / High school students -- the best and the brightest -- who act for Nation and neighbor. // It is a pleasure to be at the Super Bowl of Science. //

We meet tonight on the fiftieth anniversary of the Westinghouse Science Talent Search -- a program which has helped make the past half-century a time of extraordinary exploration. // Not to date myself, but when I was growing up, PAC-MAN was a hiker, not a video game. / Who knows how future endeavors will make ours a richer, more decent world? //

((Now, I'll admit. It's pretty hard for me to claim I'm adept at high tech when my grandkids keep clobbering me at "Nintendo." // I remember how once my science teacher said to me, "Whatever you do in life I hope you'll hold the torch on high

-- as long as it isn't a bunsen burner." // Even so, I did try a recent experiment that I'm proud of. I connected my VCR to our microwave oven and watched "Gone With the Wind" in 12 and 1/2 minutes.)) //

Tonight, we honor distinguished scientists and researchers, who are opening doors into an age where mankind not only moved into the future -- but re-invented it. // Think of discoveries like biotechnology and the microchip. And of pioneers like Kilby and Noyce ~~and Herbert~~ or Cohen Boyer, the first ~~person~~ two people to splice a gene. All knew, as Thomas Jefferson wrote to a Polish general who fought with us in the Revolutionary War, "The main objects of all science are the freedom and happiness of man." //

Since the dark days of World War II, Westinghouse recipients have aided this freedom -- becoming an instrument of liberty and the symbol of the information age. // From the first man to win the top prize in the Science Talent Search -- Paul Teschan [Teh-SHAWN], saving soldiers' lives with the artificial kidney in the Korean War -- to Raymond Kurzweil, whose reading devices make life easier for the blind -- each has **reached** for the stars -- so that future generations of Americans might someday **travel** to them. //

This program's history reaffirms that truth. Five Westinghouse award recipients have won the Nobel Prize. Eight have received MacArthur Fellowships. // Three have been admitted to the National Academy of Engineering. Twenty-eight

have also been elected to to the National Academy of Sciences -- one of your profession's highest honors. //

Albert Einstein put it best when he noted that everything that is really great and inspiring is created by individuals who labor in freedom. In short, he believed what all of these honorees believe -- freedom works. This year's national winners -- 40 in all -- were culled from more than 1,400 entries. Many belong to their school debate team, baseball club, their newspaper, their church group or band. // All have created research projects which show how the trailblazers of today can be the heroes of tomorrow. //

Consider Clifford Wang of Vero Beach. He proposed that seaweed can be grown in the ocean to remove metal pollutants and then harvested for methane generation, cleaning the environment while at the same time producing energy. / Or Tara Bahna-James of New York City, who explored the relationship between math aptitude and musical talent. / In Spring, Texas, Wade Butin developed a varnish to withstand the rigors of weather and salt water. / And in Pittsburgh, Susan Criss recently completed a two-year project that showed how betacarotene in the bloodstream may reduce the risk of cancer. //

These and other projects show how learning is always a continuation, never a consummation -- that because freedom works, dreams make possible even greater dreams. // ((Here is a story which magnifies that fact. 1843. A Commissioner of Patents made a report to President Tyler. He said: "The advancement of the

arts from year to year taxes our credulity and seems to presage the arrival of that period when human improvement must end." // He went on to urge that the Patent Office be liquidated -- even Ripley wouldn't believe this -- because, he allegedly believed, there was nothing else to be invented.)) //

Today, all of us know better. We realize this Nation has no natural resources like its intellectual resources. So we must, and are, assisting the knowledge that is our most enduring legacy -- vital to everything we are and can become. //

The Nation's Governors and I have set a goal for U.S. students to be Number One in the world in math and science learning by the year 2000. We can achieve it. We will. // To start with, we will achieve it through our new National Educational Excellence Act that I will soon send to Congress. Last fall Congress acted favorably on our initiative for National Science Scholars program, which will give America's youth a special incentive to excel in science, mathematics, and engineering. //

We will also achieve this goal through research and development in all areas of science, technology, and engineering. Last month I submitted my new budget to the Congress, and it includes special emphasis on math and science education. We propose an increase of $225 million for math and science education. New funding for R & D totaling $76 billion -- including a record high of over $13 billion for basic science research. //

Our budget will continue our commitment to double the funding for the National Science Foundation. / Devote over $16 billion for major space activities -- up 15 per cent over last year -- and support the development of worthy ideas from electric powered vehicles to high performance computing to the human genome project. / It gives more money than ever to the small science research -- research by individuals -- embodied by the Westinghouse Science Talent Search. And it urges Congress to provide the 28 percent increase I seek to raise the quality of pre-college math and science education which we must do if American science and technology will continue to lead the world.

This budget will help freedom work at home. Yet freedom has also helped advance the cause of liberty abroad. // For evidence, look to the Persian Gulf, where achievements in science are responsible for the high-tech equipment which has served our military so well. //

In the past, some have urged that we depend more for our protection on theories of deterrence than technologies of defense. Well, thank God that when the Scuds came -- the people of Israel and Saudi Arabia had more to protect them than some abstract theory of deterrence. //

Go to Riyadh or Tel Aviv. A theory didn't protect its citizens. Patriot missiles born of technology did. Because of science and technology -- because of American creativity -- thousands of innocent civilians -- priceless human lives -- have

been spared. The Patriot and other missiles show how American innovation stems from American inspiration. //

If the cause of peace is to continue being served by American military power, it must continue being advanced by American brain power. // Ask our troops in the Gulf. Yes, the finest soldiers, sailors, Marines, airmen, and Coast Guardsmen any Nation has ever had. I think today especially of the ten coalition POWs, including several Americans, who are on their way back home -- and our remaining POWs, who should not be far behind. They know how each day science and technology brought closer freedom's ultimate victory. // Ask, too, those other great heroes -- our teachers. Each day they give perhaps the greatest gift of sharing their knowledge with others. // Ask, finally, America's students and parents. They know that while learning is very practical, it is also among mankind's most noble endeavors. It can presage a new Golden Age -- yes, a new world order -- where creativity flows -- more than ever -- from the human heart and mind. //

Over the past half-century, scientific breakthroughs have benefited us all. From the first radar / to pioneering advances in shock and burn treatment / to the revolutionary laser / to the high-tech of today / America's scientists have done their duty -- as they will in the future. // Helping us not merely to prevail at war -- but also, more importantly, to win the peace.

What a magnificent legacy for the Westinghouse Science Talent Search. / What a magnificent metaphor for the dream that

is America. / Thank you for tonight -- and for helping freedom to work. Please continue to pray for our sons and daughters in the Persian Gulf, and for peace in that troubled corner of the world. God bless America.

# # # #

incl. POTUS comments

CURT: addition on projects (James + Criss)?

(Smith/Cawley)
February 25, 1991
9 A.M.
WEST

PRESIDENTIAL REMARKS: WESTINGHOUSE ADDRESS
WASHINGTON HILTON HOTEL
MONDAY, MARCH 4, 1991
7:00 P.M.

Add Gov & Mrs. Sununu

Secretary Sullivan, Dr. Bromley, Dr. Seaborg, Mr. Lego [Leg-go], Mr. Sherburne, Ms. Luszcz [Loosh], Monsignor Quinn, Mr. Flatow, Flat-toe Trustees ~~Members~~ of the Westinghouse ~~Science~~ Foundation, past and current Westinghouse Award recipients, judges of the Science Talent Search, distinguished guests of science, ladies and gentlemen. /

Thank you, Mr. Lego, for that introduction, and for your warm reception. And let me welcome to Washington the trustees of our posterity. / High school students -- the best and the brightest -- who act for Nation and neighbor. // It is a pleasure to be at the Super Bowl of Science. //

We meet tonight on the fiftieth anniversary of the Westinghouse Science Talent Search -- a program which has helped make the past half-century a time of extraordinary exploration. // Not to date myself, but when I was growing up, PAC-MAN was a hiker, not a video game. / Who knows how future endeavors will make ours a richer, more decent world? //

((Now, I'll admit. It's pretty hard for me to claim I'm adept at high tech when my grandkids keep clobbering me at "Nintendo." // I remember how once my science teacher said to me, "Whatever you do in life I hope you'll hold the torch on high -- as long as it isn't a bunsen burner." // Even so, I did try

a recent experiment that I'm proud of. I connected my VCR to our microwave oven and watched "Gone With the Wind" in 12 and 1/2 minutes.)) //

Tonight, we honor distinguished scientists and researchers, who are opening doors into an age where mankind not only moved into the future -- but re-invented it. // Think of discoveries like biotechnology and the microchip. And of pioneers like Kilby and Noyce and Herbert Boyer, the first person to splice a gene. All knew, as Thomas Jefferson wrote to a Polish general who fought with us in the Revolutionary War, "The main objects of all science are the freedom and happiness of man." //

Since the dark days of World War II, Westinghouse recipients have aided this freedom -- becoming an instrument of liberty and the symbol of the information age. // From the first man to win the top prize in the Science Talent Search -- Paul Teschan [Teh-SHAWN], saving soldiers' lives with the artificial kidney in the Korean War -- to Raymond Kurzweil, whose reading devices make life easier for the blind -- each has **reached** for the stars -- so that future generations of Americans might someday **travel** to them. //

This program's history reaffirms that truth. Five Westinghouse award recipients have won the Nobel Prize. Eight have received MacArthur Fellowships. // Three have been admitted to the National Academy of Engineering. Twenty-eight have also been elected to to the National Academy of Sciences -- one of your profession's highest honors. //

Albert Einstein put it best when he noted that everything that is really great and inspiring is created by individuals who labor in freedom. In short, he believed what all of these honorees believe -- freedom works. This year's national winners -- 40 in all -- were culled from more than 1,400 entries. Many belong to their school debate team, baseball club, their newspaper, their church group or band. // All have created research projects which show how the trailblazers of today can be the heroes of tomorrow. //

Consider Clifford Wang of Vero Beach. He proposed that seaweed can be grown in the ocean to remove metal pollutants and then harvested for methane generation, cleaning the environment while at the same time producing energy. / Or Tara Bahna-James of New York City, who explored the relationship between math aptitude and musical talent. / In Spring, Texas, Wade Butin developed a varnish to withstand the rigors of weather and salt water. / And in Pittsburgh, Susan Criss recently completed a two-year project that showed how betacarotene in the bloodstream may reduce the risk of cancer. //

These and other projects show how learning is always a continuation, never a consummation -- that because freedom works, dreams make possible even greater dreams. // ((Here is a story which magnifies that fact. 1843. A Commissioner of Patents made a report to President Tyler. He said: "The advancement of the arts from year to year taxes our credulity and seems to presage the arrival of that period when human improvement must end." //

He went on to urge that the Patent Office be liquidated -- even Ripley wouldn't believe this -- because, he allegedly believed, there was nothing else to be invented.)) //

Today, all of us know better. We realize this Nation has no natural resources like its intellectual resources. So we must, and are, assisting the knowledge that is our most enduring legacy -- vital to everything we are and can become. //

The Nation's Governors and I have set a goal for U.S. students to be Number One in the world in math and science learning by the year 2000. We can achieve it. We will. // To start with, we will achieve it through our new National Educational Excellence Act that I will soon send to Congress. Last fall Congress acted favorably on our initiative for National Science Scholars program, which will give America's youth a special incentive to excel in science, mathematics, and engineering. //

We will also achieve this goal through research and development in all areas of science, technology, and engineering. Last month I submitted my new budget to the Congress, and it includes special emphasis on math and science education. We propose an increase of $225 million for math and science education. New funding for R & D totaling $76 billion -- including a record high of over $13 billion for basic science research. //

Our budget will continue our commitment to double the funding for the National Science Foundation. / Devote over $16

billion for major space activities -- up 15 per cent over last year -- and support the development of worthy ideas from electric powered vehicles to high performance computing to the human genome project. / It gives more money than ever to the small science research -- research by individuals -- embodied by the Westinghouse Science Talent Search. And it urges Congress to provide the 28 percent increase I seek to raise the quality of pre-college math and science education which we must do if American science and technology will continue to lead the world.

This budget will help freedom work at home. Yet freedom has also helped advance the cause of liberty abroad. // For evidence, look to the Persian Gulf, where achievements in science are responsible for the high-tech equipment which has served our military so well. //

In the past, some have urged that we depend more for our protection on theories of deterrence than technologies of defense. Well, thank God that when the Scuds came -- the people of Israel and Saudi Arabia had more to protect them than some abstract theory of deterrence. //

Go to Riyadh or Tel Aviv. A theory didn't protect its citizens. Patriot missiles born of technology did. Because of science and technology -- because of American creativity -- thousands of innocent civilians -- priceless human lives -- have been spared. The Patriot and other missiles show how American innovation stems from American inspiration. //

If the cause of peace is to continue being served by American military power, it must continue being advanced by American brain power. // Ask our troops in the Gulf. Yes, the finest soldiers, sailors, Marines, airmen, and Coast Guardsmen any Nation has ever had. They know the value of science and technology. Each day it brought closer freedom's ultimate victory. // Ask those other great heroes -- our teachers. Each day they give perhaps the greatest gift of sharing their knowledge with others. // Ask, finally, America's students and parents. They know that while learning is very practical, it is also among mankind's most noble endeavors. It can presage a new Golden Age -- yes, a new world order -- where creativity flows -- more than ever -- from the human heart and mind. //

Over the past half-century, scientific breakthroughs have benefited us all. From the first radar / to pioneering advances in shock and burn treatment / to the revolutionary laser / to the high-tech of today / America's scientists have done their duty -- as they will in the future. // Helping us not merely to prevail at war -- but also, more importantly, to win the peace.

What a magnificent legacy for the Westinghouse Science Talent Search. / What a magnificent metaphor for the dream that is America. / Thank you for tonight -- and for helping freedom to work. Please continue to pray for our sons and daughters in the Persian Gulf, and for peace in that troubled corner of the world. And let me leave you with three of the most beautiful words in ours or any language. God bless America.

To POTUS

(Smith/Cawley)
February 25, 1991
9 A.M.
WEST

PRESIDENTIAL REMARKS: WESTINGHOUSE ADDRESS
WASHINGTON HILTON HOTEL
MONDAY, MARCH 4, 1991
7:00 P.M.

Secretary Sullivan, Dr. Bromley, Dr. Seaborg, Mr. Lego [Leg-go], Mr. Sherburne, Ms. Luszcz [Loosh], Monsignor Quinn, Mr. Flatow, Members of the Westinghouse Science Foundation, past and current Westinghouse Award recipients, judges of the Science Talent Search, distinguished guests of science, ladies and gentlemen. /

Thank you, Mr. Lego, for that introduction, and for your warm reception. And let me welcome to Washington the trustees of our posterity. / High school students -- the best and the brightest -- who act for Nation and neighbor. // It is a pleasure to be at the Super Bowl of Science. //

We meet tonight on the fiftieth anniversary of the Westinghouse Science Talent Search -- a program which has helped make the past half-century a time of extraordinary exploration. // Not to date myself, but when I was growing up, PAC-MAN was a hiker, not a video game. / Who knows how future endeavors will make ours a richer, more decent world? //

((Now, I'll admit. Few have called me a virtuoso in science. // It's pretty hard for me to claim I'm adept at high tech when my grandkids keep beating me at "Nintendo." // I remember how once my science teacher said to me, "Whatever you do in life I hope you'll hold the torch on high -- as long as it

isn't a bunsen burner." // Even so, I did try a recent experiment that I'm proud of. I connected my VCR to our microwave oven and watched "Gone With the Wind" in 12 and 1/2 minutes.)) //

Tonight, we honor scientists and researchers who -- thankfully -- have not followed my lead. Opening doors into an age where mankind not only moved into the future -- but re-invented it. // Think of discoveries like biotechnology and the microchip. And of pioneers like Kilby and Noyce and Herbert Boyer, the first person to splice a gene. All knew, as Thomas Jefferson wrote to a Polish general who fought with us in the Revolutionary War, "The main objects of all science are the freedom and happiness of man." //

Since the dark days of World War II, Westinghouse recipients have aided this freedom -- becoming an instrument of liberty and the symbol of the information age. // From the first man to win the top prize in the Science Talent Search -- Paul Teschan [Teh-SHAWN], saving soldiers' lives with the artificial kidney in the Korean War -- to Raymond Kurzweil, whose reading devices make life easier for the blind -- each has **reached** for the stars -- so that future generations of Americans might someday **travel** to them. //

This program's history reaffirms that truth. Five Westinghouse award recipients have won the Nobel Prize. Eight have received MacArthur Fellowships. // Three have been admitted to the National Academy of Engineering. Twenty-eight

have also been elected to to the National Academy of Sciences -- one of your profession's highest honors. //

Albert Einstein put it best when he noted that everything that is really great and inspiring is created by individuals who labor in freedom. In short, he believed what all of these honorees believe -- freedom works. This year's national winners -- 40 in all -- were culled from more than 1,400 entries. Many belong to their school debate team, baseball club, their newspaper, their church group or band. // All have created research projects which show how the trailblazers of today can be the heroes of tomorrow. //

Consider Clifford Wang of Vero Beach. He proposed that seaweed can be grown in the ocean to remove metal pollutants and then harvested for methane generation, cleaning the environment while at the same time producing energy. / Or Tara Bahna-James of New York City, who explored the relationship between math aptitude and musical talent. / In Spring, Texas, Wade Butin developed a varnish to withstand the rigors of weather and salt water. / And in Pittsburgh, Susan Criss recently completed a two-year project that showed how betacarotene in the bloodstream may reduce the risk of cancer. //

These and other projects show how learning is always a continuation, never a consummation -- that because freedom works, dreams make possible even greater dreams. // ((Here is a story which magnifies that fact. 1843. A Commissioner of Patents made a report to President Tyler. He said: "The advancement of the

arts from year to year taxes our credulity and seems to presage the arrival of that period when human improvement must end." // He went on to urge that the Patent Office be liquidated -- even Ripley wouldn't believe this -- because, he allegedly believed, there was nothing else to be invented.)) //

Today, all of us know better. We realize this Nation has no natural resources like its intellectual resources. So we must, and are, assisting the knowledge that is our most enduring legacy -- vital to everything we are and can become. //

The Nation's Governors and I have set a goal for U.S. students to be Number One in the world in math and science learning by the year 2000. We can achieve it. We will. // To start with, we will achieve it through our new National Educational Excellence Act that I will soon send to Congress. Last fall Congress acted favorably on our initiative for National Science Scholars program, which will give America's youth a special incentive to excel in science, mathematics, and engineering. //

We will also achieve this goal through research and development in all areas of science, technology, and engineering. Last month I submitted my new budget to the Congress, and it includes special emphasis on math and science education. We propose an increase of $225 million for math and science education. New funding for R & D totaling $76 billion -- including a record high of over $13 billion for basic science research. //

Our budget will continue our commitment to double the funding for the National Science Foundation. / Devote over $16 billion for major space activities -- up 15 per cent over last year -- and support the development of worthy ideas from electric powered vehicles to high performance computing to the human genome project. / It gives more money than ever to the small science research -- research by individuals -- embodied by the Westinghouse Science Talent Search. And it urges Congress to provide the 28 percent increase I seek to raise the quality of pre-college math and science education which we must do if American science and technology will continue to lead the world.

This budget will help freedom work at home. Yet freedom has also helped advance the cause of liberty abroad. // For evidence, look to the Persian Gulf, where achievements in science are responsible for the high-tech equipment which has served our military so well. //

In the past, some have urged that we depend more for our protection on theories of deterrence than technologies of defense. Well, thank God that when the Scuds came -- the people of Israel and Saudi Arabia had more to protect them than some abstract theory of deterrence. //

Go to Riyadh or Tel Aviv. A theory didn't protect its citizens. Patriot missiles born of technology did. Because of science and technology -- because of American creativity -- thousands of innocent civilians -- priceless human lives -- have

been spared. The Patriot and other missiles show how American innovation stems from American inspiration. //

If the cause of peace is to continue being served by American military power, it must continue being advanced by American brain power. // Ask our troops in the Gulf. Yes, the finest soldiers, sailors, Marines, airmen, and Coast Guardsmen any Nation has ever had. They know the value of science and technology. Each day it brought closer freedom's ultimate victory. // Ask those other great heroes -- our teachers. Each day they give perhaps the greatest gift of sharing their knowledge with others. // Ask, finally, America's students and parents. They know that while learning is very practical, it is also among mankind's most noble endeavors. It can presage a new Golden Age -- yes, a new world order -- where creativity flows -- more than ever -- from the human heart and mind. //

Over the past half-century, scientific breakthroughs have benefited us all. From the first radar / to pioneering advances in shock and burn treatment / to the revolutionary laser / to the high-tech of today / America's scientists have done their duty -- as they will in the future. // Helping us not merely to prevail at war -- but also, more importantly, to win the peace.

What a magnificent legacy for the Westinghouse Science Talent Search. / What a magnificent metaphor for the dream that is America. / Thank you for tonight -- and for helping freedom to work. Please pray for our sons and daughters in the Persian

Gulf. And let me leave you with three of the most beautiful words in ours or <u>any</u> language. God bless America.

# # # #

David & Sara:
Ive highlighted & noted the changes we made.
— Carolyn

(Smith/Cawley)
February 25, 1991
9 A.M.
WEST

PRESIDENTIAL REMARKS: WESTINGHOUSE ADDRESS
WASHINGTON HILTON HOTEL
MONDAY, MARCH 4, 1991
7:00 P.M.

Secretary Sullivan, Dr. Bromley, Dr. Seaborg, Mr. Lego [Leg-go], Mr. Sherman, Ms. Luszcz [Loosh], Monsignor Quinn, Mr. Flatow, Members of the Westinghouse Science Foundation, past and current Westinghouse Award recipients, judges of the Science Talent Search, distinguished guests of science, ladies and gentlemen. /

Thank you, Mr. Lego, for that introduction, and for your warm reception. And let me welcome to Washington the trustees of our posterity. / High school students -- the best and the brightest -- who act for Nation and neighbor. // It is a pleasure to be at the Super Bowl of Science. //

We meet tonight on the fiftieth anniversary of the Westinghouse Science Talent Search -- a program which has helped make the past half-century a time of extraordinary exploration. // Not to date myself, but when I was growing up, PAC-MAN was a hiker, not a video game. / Who knows how future endeavors will make ours a richer, more decent world? //

((Now, I'll admit. Few have called me a virtuoso in science. // It's pretty hard for me to claim I'm adept at high tech when my grandkids keep beating me at "Nintendo." // I remember how once my science teacher said to me, "Whatever you do in life I hope you'll hold the torch on high -- as long as it

isn't a bunsen burner." // Even so, I did try a recent experiment that I'm proud of. I connected my VCR to our microwave oven and watched "Gone With the Wind" in 12 and 1/2 minutes.)) //

Tonight, we honor scientists and researchers who -- thankfully -- have not followed my lead. Opening doors into an age where mankind not only moved into the future -- but re-invented it. // Think of discoveries like biotechnology and the microchip. And of pioneers like Kilby and Noyce and Herbert Boyer, the first person to splice a gene. All knew, as Thomas Jefferson wrote to a Polish general who fought with us in the Revolutionary War, "The main objects of all science are the freedom and happiness of man." //

Added "who fought with us" because the letter was written in 1810 -- well after the Rev. War. Before this change, it sounded as if it occurred during the war.

Since the dark days of World War II, Westinghouse recipients have aided this freedom -- becoming an instrument of liberty and the symbol of the information age. // From the first man to win the top prize in the Science Talent Search -- Paul Teschan [Teh-SHAWN], saving soldiers' lives with the artificial kidney in the Korean War -- to Raymond Kurzweil, whose reading devices make life easier for the blind -- each has **reached** for the stars -- so that future generations of Americans might someday **travel** to them. //

Added for balance w/ Kurzweil's accomplishments.

This program's history reaffirms that truth. Five Westinghouse award recipients have won the Nobel Prize. Eight have received MacArthur Fellowships. // Three have been admitted to the National Academy of Engineering. Twenty-eight

removed "Foundation"

have also been elected to to the National Academy of Sciences -- one of your profession's highest honors. //

Albert Einstein put it best when he noted that everything that is really great and inspiring is created by individuals who labor in freedom. In short, he believed what all of these honorees believe -- freedom works. This year's national winners -- 40 in all -- were culled from more than 1,400 entries. Many belong to their school debate team, baseball club, their newspaper, their church group or band. // All have created research projects which show how the trailblazers of today can be the heroes of tomorrow. //

Consider Clifford Wang of Vero Beach. He proposed that seaweed can be grown in the ocean to remove pollutants which at the same time would produce energy. / Or Tara Bahna-James of New York City, who explored the relationship between math aptitude and musical talent. / In Spring, Texas, Wade Butin developed added a varnish to withstand the rigors of weather and salt water. / And in Pittsburgh, Susan Criss recently completed a two-year project that showed how betacarotene in the bloodstream may reduce the risk of cancer. //

These and other projects show how learning is always a continuation, never a consummation -- that because freedom works, dreams make possible even greater dreams. // ((Here is a story which magnifies that fact. ~~1843.~~ 1899 A Commissioner of Patents made a report to President ~~Tyler.~~ McKinley He said: "The advancement of the arts from year to year taxes our credulity and seems to presage

the arrival of that period when human improvement must end." // He went on to urge Congress to liquidate the Patent Office -- even Ripley wouldn't believe this -- because, he allegedly believed, <u>there was nothing else to be invented</u>.)) //

Today, all of us know better. We realize this Nation has no natural resources like its intellectual resources. So we must, and are, assisting the knowledge that is our most enduring legacy -- vital to everything we are and can become. //

The Nation's Governors and I have set a goal for U.S. students to be Number One in the world in math and science learning by the year 2000. We <u>can</u> achieve it. We <u>will</u>. // To start with, we will achieve it through our new National Educational Excellence Act that I will soon send to Congress. Last fall Congress acted favorably on our initiative for National Science Scholars program, which will give America's youth a special incentive to excel in science, mathematics, and engineering. //

We will also achieve this goal through research and development in all areas of science, technology, and engineering. Let me describe the emphasis on science and math. Our new budget for math and science education includes an increase of $225 million. New funding totals $76 billion for R & D -- including a record high of over $13 billion for basic science research. //

changed from "over $100"; per Budget, pt 2, p. 76, bottom of column 1

added, per Budget, pt. 2, p. 35

Our budget will continue our commitment to double the funding for the National Science Foundation. / Devote over $16 billion for major space activities -- up 15 per cent over last

added. This budget doesn't double it ... it's a step down the road to doubling. Budget, pt. 2, p 36

changed from "outer".

(Budget refers to "major space activities")

changed from "which support", because the electric vehicles etc. are not related to space activities.

year -- and support the development of worthy ideas from electric powered vehicles to high performance computing in the human genome project. / It gives more money than ever to the small science research -- research by individuals -- embodied by the Westinghouse Science Talent Search. And it urges Congress to provide the 28 percent increase I seek to raise the quality of pre-college math and science education which we must do if American science and technology will continue to lead the world.

This budget will help freedom work at home. Yet freedom has also helped advance the cause of liberty abroad. // For evidence, look to the Persian Gulf, where achievements in science are responsible for the high-tech equipment which has served our military so well. //

In the past, some have urged that we depend more for our protection on theories of deterrence than technologies of defense. Well, thank God that when the Scuds came -- the people of Israel and Saudi Arabia had more to protect them than some abstract theory of deterrence. //

Go to Riyadh or Tel Aviv. A theory didn't protect its citizens. Patriots Missiles born of technology did. Because of science and technology -- because of American creativity -- thousands of innocent civilians -- priceless human lives -- have been spared. ~~Thank God for~~ the Patriot and other missiles ~~which~~ show how American ~~can-do~~ innovation stems from American ~~know-how~~ inspiration. //

If the cause of peace is to continue being served by American military power, it must continue being advanced by

American brain power. // Ask our troops in the Gulf. Yes, the finest soldiers, sailors, Marines, airmen, and Coast Guardsmen any Nation has ever had. They know the value of science and technology. Each day it brought closer freedom's ultimate victory. // Ask those other great heroes -- our teachers. Each day they give perhaps the greatest gift of sharing their knowledge with others. // Ask, finally, America's students and parents. They know that while learning is very practical, it is also among mankind's most noble endeavors. It can presage a new Golden Age -- yes, a new world order -- where creativity flows -- more than ever -- from the human heart and mind. //

Addition to replace ¶ on Edward Teller.

Over the past half-century, scientific breakthroughs have benefited us all. From the first radar / to pioneering advances in shock and burn treatment / to revolutionary laser / to the high-tech of today / America's scientists have done their duty -- as they will in the future. // Helping us not merely to prevail at war -- but also, more importantly, to win the peace.

What a magnificent legacy for the Westinghouse Science Talent Search. / What a magnificent metaphor for the dream that is America. / Thank you for tonight -- and for helping freedom to work. Please pray for our sons and daughters in the Persian Gulf. And let me leave you with three of the most beautiful words in ours or any language. God bless America.

# # # #

Reconciled Version

(Smith/Cawley)
February 25, 1991
9 A.M.
WEST

PRESIDENTIAL REMARKS: WESTINGHOUSE ADDRESS
WASHINGTON HILTON HOTEL
MONDAY, MARCH 4, 1991
7:00 P.M.

Edward Silverbourne

Secretary Sullivan, Dr. Bromley, Dr. Seaborg, Mr. Lego [Leg-go], Mr. Sherman, Ms. Luszcz [Loosh], Monsignor Quinn, Mr. Flatow, Members of the Westinghouse Science Foundation, past and current Westinghouse Award recipients, judges of the Science Talent Search, distinguished guests of science, ladies and gentlemen. /

Thank you, Mr. Lego, for that introduction, and for your warm reception. And let me welcome to Washington the trustees of our posterity. / High school students -- the best and the brightest -- who act for Nation and neighbor. // It is a pleasure to be at the Super Bowl of Science. //

We meet tonight on the fiftieth anniversary of the Westinghouse Science Talent Search -- a program which has helped make the past half-century a time of extraordinary exploration. // Not to date myself, but when I was growing up, PAC-MAN was a hiker, not a video game. / Who knows how future endeavors will make ours a richer, more decent world? //

((Now, I'll admit. Few have called me a virtuoso in science. // It's pretty hard for me to claim I'm adept at high tech when my grandkids keep beating me at "Nintendo." // I remember how once my science teacher said to me, "Whatever you do in life I hope you'll hold the torch on high -- as long as it

isn't a bunsen burner." // Even so, I did try a recent experiment that I'm proud of. I connected my VCR to our microwave oven and watched "Gone With the Wind" in 12 and 1/2 minutes.)) //

Tonight, we honor scientists and researchers who -- thankfully -- have not followed my lead. Opening doors into an age where mankind not only moved into the future -- but re-invented it. // Think of discoveries like biotechnology and the microchip. And of pioneers like Kilby and Noyce and Herbert Boyer, the first person to splice a gene. All knew, as Thomas Jefferson wrote to a Polish general in the Revolutionary War, "The main objects of all science are the freedom and happiness of man." //

Since the dark days of World War II, Westinghouse recipients have aided this freedom -- becoming an instrument of liberty and the symbol of the information age. // From the first man to win the top prize in the Science Talent Search -- Paul Teschan, aiding kidney research -- to Raymond Kurzweil, whose reading devices make life easier for the blind -- each has **reached** for the stars -- so that future generations of Americans might someday **travel** to them. //

This program's history reaffirms that truth. Five Westinghouse award recipients have won the Nobel Prize. Eight have received MacArthur ~~Foundation~~ Fellowships. // Three have been admitted to the National Academy of Engineering. Twenty-

eight have also been elected to to the National Academy of Sciences -- one of your profession's highest honors. //

Albert Einstein put it best when he noted that everything that is really great and inspiring is created by individuals who labor in freedom. In short, he believed what all of these honorees believe -- freedom works. This year's national winners -- 40 in all -- were culled from more than 1,400 entries. Many belong to their school debate team, baseball club, their newspaper, their church group or band. // All have created research projects which show how the trailblazers of today can be the heroes of tomorrow. //

Consider Clifford Wang of Vero Beach. He proposed that seaweed can be grown in the ocean to remove pollutants which at the same time would produce energy. / Or Tara Bahna-James of New York City, who explored the relationship between math aptitude and musical talent. / In Spring, Texas, Wade Butin developed a varnish to withstand the ~~effect~~ rigors of weather and salt water. / And in Pittsburgh, Susan Criss recently completed a two-year project that showed how betacarotene in the bloodstream may reduce the risk of cancer. //

These and other projects show how learning is always a continuation, never a consummation -- that because freedom works, dreams make possible even greater dreams. // ((Here is a story which magnifies that fact. 1843. A Commissioner of Patents made a report to President Tyler. He said: "The advancement of the arts from year to year taxes our credulity and seems to presage

the arrival of that period when human improvement must end." // He went on to urge Congress to liquidate the Patent Office -- even Ripley wouldn't believe this -- because, he believed, there was nothing else to be invented.)) //

Today, all of us know better. We realize this Nation has no natural resources like its intellectual resources. So we must, and are, assisting the knowledge that is our most enduring legacy -- vital to everything we are and can become. //

The Nation's Governors and I have set a goal for U.S. students to be Number One in the world in math and science learning by the year 2000. We can achieve it. We will. // To start with, we will achieve it through our new National Educational Excellence Act that I will soon send to Congress. Last fall Congress acted favorably on our initiative for National Science Scholars program, which will give America's youth a special incentive to excel in science, mathematics, and engineering. //

We will also achieve this goal through research and development in all areas of science, technology, and engineering. Let me describe the emphasis on science and math. Our new budget for math and science education includes an increase of over $100 million. New funding totals $76 billion for R & D -- including a record high of $13 billion for basic ~~science~~ research. //

Our budget will double the funding for the National Science Foundation. / Devote over $16 billion for ~~outer~~ space activities -- up 15 per cent over last year -- which supports the

development of worthy ideas from electric powered vehicles to high performance computing in the human genome project. // It gives more money than ever to the small science research -- research by individuals -- embodied by the Westinghouse Science Talent Search. And urges Congress to provide the 28 percent increase I seek to raise the quality of pre-college math and science education which we must do if American science and technology will continue to lead the world.

This budget will help freedom work at home. Yet freedom has also helped advance the cause of liberty abroad. // For evidence, look to the Persian Gulf, where achievements in science are responsible for the high-tech equipment which has served our military so well. //

In the past, some have urged that we depend more for our protection on theories of deterrence than technologies of defense. Well, thank God that when the Scuds came -- the people of Israel and Saudi Arabia had more to protect them than some abstract theory of deterrence. //

Go to Riyadh or Tel Aviv. A theory didn't protect its citizens. Missles born of technology did. Because of science and technology -- because of American creativity -- thousands of innocent civilians -- priceless human lives -- have been spared. Thank God for the Patriot and other missiles which show how American can-do stems from American know-how. //

If the cause of peace is to continue being served by American military power, it must continue being advanced by

American brain power. // Ask our troops in the Gulf. Yes, the finest soldiers, sailors, Marines, airmen, and Coast Guardsmen any Nation has ever had. They know the value of science and technology. Each day it brought closer freedom's ultimate victory. // Ask those other great heroes -- our teachers. Each day they give perhaps the greatest gift of sharing their knowledge with others. // Ask, finally, America's students and parents. They know that while learning is very practical, it is also among mankind's most noble endeavors. It can presage a new Golden Age -- yes, a new world order -- where creativity flows -- more than ever -- from the human heart and mind. //

What a magnificent legacy for the Westinghouse Science Talent Search. / What a magnificent metaphor for the dream that is America. / Thank you for tonight -- and for helping freedom to work. Please pray for our sons and daughters in the Persian Gulf. And let me leave you with three of the most beautiful words in ours or any language. God bless America.

# # # #

703/ 557-3158
Patent Office

STAFFED COPY

FACT CHECK COPY

* will have just met w/ the 40 nt'l winners & viewed some projects. Note: they'll be on-stage w/ him.

(Smith/Cawley)
February 25, 1991
9 A.M.
WEST

PRESIDENTIAL REMARKS: WESTINGHOUSE ADDRESS
WASHINGTON HILTON HOTEL
MONDAY, MARCH 4, 1991
7:00 P.M.

Secretary Sullivan, Dr. Bromley, Dr. Seaborg, Mr. Lego [Leg-go], Mr. Sherman, Ms. Luszcz [Loosh], Monsignor Quinn, Mr. Flatow, Members of the Westinghouse Science Foundation, past and current Westinghouse Award recipients, judges of the Science Talent Search, distinguished guests of science, ladies and gentlemen. /

Thank you, Mr. Lego, for that introduction, and for your warm reception. And let me welcome to Washington the trustees of our posterity. / High school students -- the best and the brightest -- who act for Nation and neighbor. // It is a pleasure to be at the Super Bowl of Science. //

STS Program

We meet tonight on the fiftieth anniversary of the Westinghouse Science Talent Search -- a program which has helped make the past half-century a time of extraordinary exploration. // Not to date myself, but when I was growing up, PAC-MAN was a hiker, not a video game. / Who knows how future endeavors will make ours a richer, more decent world? //

((Now, I'll admit. Few have called me a virtuoso in science. // It's pretty hard for me to claim I'm adept at high tech when my grandkids keep beating me at "Nintendo." // I remember how once my science teacher said to me, "Whatever you do in life I hope you'll hold the torch on high -- as long as it

2,470
1,186
5,517
2,141
11,304

isn't a bunsen burner." // Even so, I did try a recent experiment that I'm proud of. I connected my VCR to our microwave oven and watched "Gone With the Wind" in 12 and 1/2 minutes.)) //

Tonight, we honor scientists and researchers who -- thankfully -- have not followed my lead. Opening doors into an age where mankind not only moved into the future -- but re-invented it. // Think of discoveries like the fax machine and the microchip. And of pioneers like Kilby and Noyce and Curie and Westinghouse. All knew, as Thomas Jefferson wrote to a Polish general in the Revolutionary War, "The main objects of all science are the freedom and happiness of man." //

Since the dark days of World War II, Westinghouse recipients have aided this freedom -- becoming an instrument of liberty and the symbol of the information age. // From the first man to win the top prize in the Science Talent Search -- Paul Teschan, aiding kidney research -- to Raymond Kurzweil, whose reading devices make life easier for the blind -- each has **reached** for the stars -- so that future generations of Americans might someday **stand** on them. //

This program's history reaffirms that truth. Five Westinghouse recipients have won the Nobel Prize. Eight have received MacArthur Foundation Fellowships. // Three have been admitted to the National Academy of Engineering. Twenty-six have also been elected to to the National Academy of Sciences -- your profession's highest elective honors. //

NAS 202/334 2000
Ken Fulton

Albert Einstein put it best when he said, "Everything that is really great and inspiring is created by individuals who labor in freedom." In short, he believed what all of these honorees believe -- freedom works. This year's national winners -- 40 in all -- were culled from more than 1,400 entries. Many belong to their school debate team, baseball club, their newspaper, their church group or band. // All have created research projects which show how the trailblazers of today can be the heroes of tomorrow. //

Consider Clifford Wang of Vero Beach. He proposed that seaweed be grown in the ocean to remove pollutants while also producing energy. / Or Tara-Bahna James of New York City, who explored the relationship between math aptitude and musical talent. / In Spring, Texas, Wade Butin developed a varnish to withstand the ~~effect~~ rigors of weather and salt water. / And in Pittsburgh, Susan Criss recently completed a two-year project that showed how beta carotene in the bloodstream may reduce the risk of cancer. //

These and other projects show how learning is always a continuance, never a consummation -- that because freedom works, dreams make possible even greater dreams. // ((Here is a story which magnifies that fact. 1843. A Commissioner of Patents made a report to President Tyler. He said: "The advancement of the arts from year to year taxes our credulity and seems to presage the arrival of that period when human improvement must end." // He went on to urge Congress to liquidate the Patent Office -- even Ripley wouldn't believe this -- because, he believed, there was nothing else to be invented.)) //

Today, all of us know better. We realize this Nation has no natural resouces like its intellectual resources. So we must, and are, assisting the knowledge that is our most enduring legacy -- vital to everything we are and can become. //

I have announced that U.S. students will be Number One by the year 2000. We can achieve it. We will. // To start with, we will achieve it through our National Educational Excellence Act that I again urge Congress to pass. Let me especially salute our new Initiative of National Science Scholars, which gives America's youth a special incentive to excel in science, mathematics, and engineering. //

We will also achieve this goal through research and development in all areas of science, technology, and engineering. Let me describe the emphasis on science and math in our new budget for Fiscal Year 1992. // Imagine: A record high of $76 billion for ~~basic research and~~ R & D, -- and basic science research ~~up $13 billion~~. / Reflect upon: A budget which will double the National Science Foundation Budget if Congress will cooperate. // Help me achieve: A budget which will devote over $16 billion for ~~outer~~ space activities -- up 15 per cent over last year. Giving more money than ever to the small science research -- research by individuals -- embodied by the Westinghouse Science Talent Search. //

This budget will help freedom work at home. Yet freedom has also helped advance the cause of liberty abroad. // For evidence, look in closing to the Persian Gulf, where achievements

in science are responsible for the high-tech equipment which has served our military so well. //

In the past, some have urged that we depend more for our protection on theories of deterrence than technologies of defense. Well, thank God that when the Scuds came -- the people of Israel and Saudi Arabia had more to protect than some abstract theory of deterrence. //

Go to Riyhad or Tel Aviv. A theory didn't protect its citizens. Missles born of technology did. Because of science and technology -- because of American creativity -- thousands of innocent civilians -- priceless human lives -- have been spared. Thank God for the Patriot and other missiles which show how American can-do stems from American know-how. //

If the cause of peace is to continue being served by American military power, it must continue being advanced by American brain power. // Ask our troops in the Gulf. Yes, the finest soldiers, sailors, Marines, airmen, and Coast Guardsmen any Nation has ever had. They know the value of science and technology. Each day it brings closer freedom's ultimate victory. // Ask those other great heroes -- our teachers. Each day they give perhaps the greatest gift of sharing their knowledge with others. // Ask, finally, America's students and parents. They know that while learning is a very practical thing -- it is also among mankind's most noble things. It can presage a new Golden Age -- yes, a new world order -- where creativity flows -- more than ever -- from the human heart and mind. //

Fifty-one years ago, one of the greatest scientists of all time was moved by an American President who spoke of how technology could further peace. // His name was Edward Teller, hearing Franklin Roosevelt declare that "the great achievements of science . . . [would help] protect our culture, our American freedom, and our civilization." // later said

Edward Teller: Giant of the Golden Age of Physics by Blumberg & Panos, p3-4

" " p.4

Teller ~~later wrote~~ that it was the duty of science to "work out the military problems, because without the work of the scientists, the war and the world would be lost." // He did his duty -- as you have -- as you are today. Helping to win the war in the Persian Gulf -- just as we will win the peace that follows. //

What a magnificent legacy for the Westinghouse Science Talent Search. / What a magnificent metaphor for the dream that is America. / Thank you for tonight -- and for helping freedom to work. Please pray for our sons and daughters in the Persian Gulf. And let me leave you with three of the most beautiful words in ours or <u>any</u> language. God bless America.

# # # #

(Smith/Cawley)
February 25, 1991
9 A.M.
WEST

PRESIDENTIAL REMARKS: WESTINGHOUSE ADDRESS
WASHINGTON HILTON HOTEL
MONDAY, MARCH 4, 1991
7:00 P.M.

Secretary Sullivan, Dr. Bromley, Dr. Seaborg, Mr. Lego [Leg-go], Mr. Sherman, Ms. Luszcz [Loosh], Monsignor Quinn, Mr. Flatow, Members of the Westinghouse Science Foundation, past and current Westinghouse Award recipients, judges of the Science Talent Search, distinguished guests of science, ladies and gentlemen. /

Thank you, __, for that introduction, and for your warm reception. And let me welcome to Washington the trustees of our posterity. / High school students -- the best and the brightest -- who act for Nation and neighbor. // It is a pleasure to be at the Super Bowl of Science. //

We meet tonight on the fiftieth anniversary of the Westinghouse Science Talent Search -- a program which has helped make the past half-century a time of extraordinary exploration. // Not to date myself, but when I was growing up, PAC-MAN was a hiker, not a video game. / Who knows how future endeavors will make ours a richer, more decent world? //

((Now, I'll admit. Few have called me a virtuoso in science. // It's pretty hard for me to claim I'm adept at high tech when my grandkids keep beating me at "Nintendo." // I remember how once my science teacher said to me, "Whatever you do in life I hope you'll hold the torch on high -- as long as it

isn't a bunsen burner." // Even so, I did try a recent experiment that I'm proud of. I connected my VCR to our microwave oven and watched "Gone With the Wind" in 12 and 1/2 minutes.)) //

Tonight, we honor scientists and researchers who -- thankfully -- have not followed my lead. Opening doors into an age where mankind not only moved into the future -- but re-invented it. // Think of discoveries like the fax machine and the microchip. And of pioneers like Kilby and Noyce and Curie and Westinghouse. All knew, as Thomas Jefferson wrote to a Polish general in the Revolutionary War, "The main objects of all science are the freedom and happiness of man." //

Since the dark days of World War II, Westinghouse recipients have aided this freedom -- becoming an instrument of liberty and the symbol of the information age. // From the first man to win the top prize in the Science Talent Search -- Paul Teschan, aiding kidney research -- to Raymond Kurzweil, whose reading devices make life easier for the blind -- each has **reached** for the stars -- so that future generations of Americans might someday **stand** on them. //

This program's history reaffirms that truth. Five Westinghouse recipients have won the Nobel Prize. Eight have received MacArthur Foundation Fellowships. // Twenty-six have been elected to to the National Academy of Sciences -- your profession's highest elective honor. Recently, __ Westinghouse

students have been admitted to the National Academy of Engineering. //

Albert Einstein put it best when he said, "Everything that is really great and inspiring is created by individuals who labor in freedom." In short, he believed what all of these honorees believe -- freedom works. This year's winners -- 40 in all -- were culled from more than 1,400 entries. Many belong to their school debate team, baseball club, their newspaper, their church group or band. // All have created research projects which show how the trailblazers of today can be the heroes of tomorrow. //

Consider Clifford Wang of Vero Beach. He proposed that seaweed be grown in the ocean to remove pollutants while also producing energy. / Or Tara-Bahn James of New York City, who explored the relationship between math aptitude and music talent. / In Spring, Texas, Wade Butin developed varnish to withstand the effect of weather and salt water. / And in Pittsburgh, Susan Criss recently completed a two-year project that showed how becacarotene may reduce the risk of cancer. //

These and other projects show how learning is always a continuance, never a consummation -- that because freedom works, dreams make possible even greater dreams. // ((Here is a story which magnifies that fact. 1843. A Commissioner of Patents made a report to President __. He said: "The advancement of the arts from year to year taxes our credulity and seems to presage the arrival of that period when human improvement must end." // He went on to urge the liquidation of the Patent Office -- even

Ripley wouldn't believe this -- because, he believed, there was nothing else to be invented.)) //

Today, all of us know better. We realize this Nation has no natural resouces like its intellectual resources. So we must, and are, assisting the knowledge that is our most enduring legacy -- vital to everything we are and can become. //

I have announced that U.S. students will be Number One by the year 2000. We can achieve it. We will. // To start with, we will achieve it through our National Educational Excellence Act that I again urge Congress to pass. Let me especially salute our new Initiative of National Science Scholars, which gives America's youth a special incentive to excel in science, mathematics, and engineering. //

We will also achieve this goal through research and development in all areas of science, technology, and engineering. Let me describe the emphasis on science and math in our new budget for Fiscal Year 1992. // Imagine: A record high of $76 billion for basic research and R & D. -- and basic science research up $13 billion. / Reflect upon: A budget which will double the National Science Foundation Budget if Congress will cooperate. // Help me achieve: A budget which will devote over $16 billion for outer space activities -- up 15 per cent over last year. Giving more money than ever to the small science research -- research by individuals -- embodied by the Westinghouse Science Talent Search. //

This budget will help freedom work at home. Yet freedom has also helped advance the cause of liberty abroad. // For evidence, look in closing to the Persian Gulf, where achievements in science are responsible for the high-tech equipment which has served our military so well. //

In the past, some have urged that we depend more for our protection on theories of deterrence than technologies of defense. Well, thank God that when the Scuds came -- the people of Israel and Saudi Arabia had more to protect than some abstract theory of deterrence. //

Go to Riyhad or Tel Aviv. A theory didn't protect its citizens. Missles born of technology did. Because of science and technology -- because of American creativity -- thousands of innocent civilians -- priceless human lives -- have been spared. Thank God for the Patriot and other missiles which show how American can-do stems from American know-how. //

If the cause of peace is to continue being served by American military power, it must continue being advanced by American brain power. // Ask our troops in the Gulf. Yes, the finest soldiers, sailors, Marines, airmen, and Coast Guardsmen any Nation has ever had. They know the value of science and technology. Each day it brings closer freedom's ultimate victory. // Ask those other great heroes -- our teachers. Each day they give perhaps the greatest gift of sharing their knowledge with others. // Ask, finally, America's students and parents. They know that while learning is a very practical thing

-- it is also among mankind's most noble things. It can presage a new Golden Age -- yes, a new world order -- where creativity flows -- more than ever -- from the human heart and mind. //

Fifty-one years ago, one of the greatest scientists of all time was moved by an American President who spoke of how technology could further peace. // His name was Edward Teller, hearing Franklin Roosevelt declare that "the great achievements of science . . . [would help] protect our culture, our American freedom, and our civilization." //

Teller later wrote that it was the duty of science to "work out the military problems, because without the work of the scientists the war and the world would be lost." // He did his duty -- as you have -- as you are today. Helping to win the war in the Persian Gulf -- just as we will win the peace that follows. //

What a magnificent legacy for the Westinghouse Science Talent Search. / What a magnificent metaphor for the dream that is America. / Thank you for tonight -- and for helping freedom to work. Please pray for our sons and daughters in the Persian Gulf. And let me leave you with three of the most beautiful words in ours or any language. God bless America.

# # # #

Dan — Corrects please
Thanks
Cur

(Smith/Cawley)
February 20, 1991
9 A.M.
WEST

PRESIDENTIAL REMARKS: WESTINGHOUSE ADDRESS
WASHINGTON HILTON HOTEL
Monday, MARCH 4, 1991
7:00 P.M.

Secretary Sullivan, Dr. Bromley, Dr. Seaborg, Mr. Lego [Leg-go], Mr. Sherman, Ms. Luszcz [Loosh], Monsignor Quinn, Mr. Flatow, Members of the Westinghouse Science Foundation, past and current Westinghouse Award recipients, judges of the Science Talent Search, distinguished guests of science, ladies and gentlemen. /

Thank you, __, for that introduction, and for your warm reception. And let me welcome to Washington the trustees of our posterity. / High school students -- the best and the brightest -- who act for Nation and neighbor. // It is a pleasure to be at the Super Bowl of Science. //

We meet tonight on the fiftieth anniversary of the Westinghouse Science Talent Search -- a program which has helped make the past half-century a time of extraordinary exploration. // Not to date myself, but when I was growing up, PAC-MAN was a hiker, not a video game. / Who dares guess how future endeavors will make ours a better, richer, more decent world? //

((Now, I'll admit. Few have ever called me a virtuoso in science. // It's pretty hard for me to claim I'm adept at high-tech when my grandkids keep beating me at "Nintendo." // Case in point. One day my science teacher said to me, "Whatever you do in life I hope you'll hold the torch on high --as long as it

isn't a bunsen burner. // Even so, I did try a recent experiment that I'm proud of. I connected a VCR to a microwave oven and watched "Gone With the Wind" in 12 and 1/2 minutes.)) //

Tonight, we honor scientists and researchers who -- thankfully -- have not followed my lead. Opening doors into an age where mankind not only moved into the future -- but re-invented it. // Think of discoveries like the fax machine and the microchip. And of pioneers like Kilby and Noyce and Curie and Westinghouse. All knew, as Thomas Jefferson wrote to a Polish general in the Revolutionary War, "The main objects of all science are the freedom and happiness of man." //

Since the dark days of World War II, Westinghouse recipients have aided this freedom -- becoming an instrument of liberty and the symbol of the information age. // From the first man to win the top prize in the Science Talent Search -- Paul Teschan, aiding kidney research -- to Raymond Kurzweil, whose reading devices make life easier for the blind -- each has **reached** for the stars -- so that future generations of Americans might someday **stand** on them. //

This program's history reaffirms that truth. Five Westinghouse recipients have won the Nobel Prize. They knew that freedom works. So did the eight receiving MacArthur Foundation Fellowships. // The twenty-six elected to to the National Academy of Sciences -- your profession's highest elective honor -- they, too, know how freedom works. So have the __ Westinghouse

students admitted to the National Academy of Engineering. // Governor Sununu especially likes that fact. //

Albert Einstein put it best when he said, "Everything that is really great and inspiring is created by individuals who labor in freedom." For example, look at this year's winners -- 40 in all, culled from more than 1,400 entries. Many belong to their school debate team, baseball club, their newspaper, their church group or band. // All have created research projects which show how the trailblazers of today can be the heroes of tomorrow. //

Consider Clifford Wang of Vero Beach. He proposed that seaweed be grown in the ocean to remove pollutants while also producing energy. / Or Susan Criss of Pittsburgh, recently completing a 2-year project that showed how becacarature can reduce cancer. / In Spring, Texas, Wade Butin developed varnish to withstand the effect of weather and salt water. / And in New York City, Tara-Bahn James explored the relationship between math aptitude and music talent. //

((Let me tell you a story. Happened in 1843. A Commissioner of Patents made a report to President __. This is what he said. "The advancement of the arts from year to year taxes our credulity and seems to presage the arrival of that period when human improvement must end." // He went on to urge the liquidation of the Patent Office because -- even Ripley wouldn't believe this -- there was nothing else to be invented.))

All of you know better. You realize that learning is always a continuance, never a consummation -- that because freedom

works, dreams make possible even greater dreams. // This Nation has no natural resouces like its intellectual resources. So we must, and are, assisting the knowledge that is our most enduring legacy -- vital to everthing we are and can become. //

I have announced that U.S. students will be Number One by the year 2000. We can achieve it. We will. // We will achieve it through our National Educational Excellence that I again urge Congress to pass. Let me especially salute ~~new~~ Initiative of National Science Scholars, which gives America's youth a special incentive to excel in science, mathematics, and engineering. //

We will also achieve this goal through research and development in all areas of science, technology, and engineering. Let me describe the emphasis on science and math in our new budget for Fiscal Year 1992. // Imagine: A record high of $76 billion for basic research and R & D. -- and basic science research up $13 billion. / Reflect upon: A budget which will double the National Science Foundation Budget if Congress will cooperate. // Help me achieve: A budget which will devote over $16 billion for outer space activities -- up 15 per cent over last year. Giving more money than ever to the small science research -- research for individuals -- embodied by the Westinghouse Science Talent Search. //

This budget will help freedom work at home. Yet freedom has also helped advance the cause of liberty abroad. // For evidence, look in closing to the Persian Gulf, where achievements

in science are responsible for the high-tech equipment which has served our military so well. //

In the past, some have urged that we depend more for our protection on theories of deterrence than technologies of defense. Well, thank God that when the Scuds came -- the people of Israel and Saudi Arabia had more to protect than some abstract theory of deterrence. //

Go to Riyhad or Tel Aviv. A theory didn't protect its citizens. Missles born of technology did. Because of science and technology -- because of American creativity -- thousands of innocent civilians -- priceless human lives -- have been spared. Thank God for the Patriot and other missiles which show how American can-do stems from American know-how. //

If the cause of peace is to continue being served by American military power, it must continue being advanced by American brain power. // Ask our troops in the Gulf. Yes, the finest soldiers, sailors, Marines, airmen, and Coast Guardsmen any Nation has ever had. They know the value of science and technology. Each day it brings closer freedom's ultimate victory. // Ask those other great heroes -- our teachers. Each day they give perhaps the greatest gift of sharing their knowledge with others. // Ask, finally, America's students and parents. They know that while learning is a very practical thing -- it is also among mankind's most noble things. It can presage a new Golden Age -- yes, a new world order -- where creativity flows -- more than ever -- from the human heart and mind. //

Fifty-one years ago, one of the greatest scientists of all time was moved by an American President who spoke of how technology could further peace. // His name was Edward Teller, hearing Franklin Roosevelt declare that "the great achievements of science . . . [would help] protect our culture, our American freedom, and our civilization." //

Teller later wrote that it was the duty of science to "work out the military problems, because without the work of the scientists the war and the world would be lost." // He did his duty -- as you have -- as you are today. Helping to win the war in the Persian Gulf -- just as we will win the peace that follows. //

What a magnificent legacy for the Westinghouse Science Talent Search. / What a magnificent metaphor for the dream that is America. / Thank you for tonight -- and for helping freedom to work. Please pray for our sons and daughters in the Persian Gulf. And let me leave you with three of the most beautiful words in ours or <u>any</u> language. God bless America.

# # # #

Services of Mead Data Central

1ST STORY of Level 1 printed in FULL format.

Copyright (c) 1987 The New York Times Company;
The New York Times

June 8, 1987, Monday, Late City Final Edition

SECTION: Section A; Page 1, Column 2; National Desk

LENGTH: 2672 words

HEADLINE: SCIENCE DEBATES USING TOOLS TO REDESIGN LIFE

SERIES: NEW LIFE: THE PROMISE AND RISK OF GENETIC ENGINEERING - FIRST OF THREE ARTICLES

BYLINE: By KEITH SCHNEIDER, Special to the New York Times

DATELINE: WASHINGTON, June 7

BODY:

Genetic engineering, the most powerful and precise biological tool for manipulating life ever devised, has reached a milestone.

Fourteen years after scientists first spliced genetic material from one microbe into another to create a bit of life that never before existed, genetic alterations once confined to science fiction are becoming ever more common.

Now the United States Patent and Trademark Office has ruled that genetic engineers may patent higher life forms - even mammals. The decision promises to widen vastly the commercial and agricultural applications of novel methods of producing new kinds of life.

Industrial leaders say they must be able to patent new life forms and processes if they are to protect their investments and move forward in a field full of innovation and risk. But the patent office ruling has also revived anxiety about the safety and morality of tampering with life forms.

Hearings Planned This Week

That concern prompted a Congressional committee to schedule hearings this week on ethics and regulations in the field of genetic engineering. Last month, the Senate approved a measure that would prevent the Patent Office from spending money on reviewing patents for animals, but it still faces a conference committee vote.

In the near future biotechnology may see these developments:

* In laboratories across the country, the genes of viruses and bacteria will be placed in plants to enable them to produce their own insecticides or fertilizers. These so-called transgenic plants will be field-tested, and farmers will begin using them in place of conventional crop varieties.

* Researchers will manipulate the primordial cells that produce sperm and eggs to enable breeders to select the characteristics of animals, including gender.

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1987 The New York Times, June 8, 1987

* Scientists will routinely transplant a gene from one species to another.

A Rust-Colored Pig

As the debate unfolds, many eyes will turn to a rust-colored pig in Beltsville, Md., with the growth hormone gene of a cow. That pig represents success to the genetic engineers and, because of its pathetic infirmities, new reason for concern to those who fear that mankind now has too many tools for meddling in the complex matter of life.

In recent months most of the concern about genetic engineering centered on the release into the environment of newly devised organisms in the form of bacteria designed to help plants resist pests, diseases and bad weather. With the new patent ruling, however, the concern has begun to shift to more complicated genetic manipulation in higher life forms -mammals - resulting in transgenic creatures like the pig with a cow gene.

In the long run, opponents and proponents of genetic engineering see a vast array of potential applications, including plants and microbes designed to produce fuel; cows that produce medicines instead of milk, or even babies destined to have a particular height, hair color or other traits.

The genetic traits of plants and animals have been manipulated for centuries. But until now animal breeding and the hybridization of crop plants have been slow, cumbersome and difficult. Furthermore, until now, breeders were never able to introduce genes from one species into another or to make such extensive changes. Redesigning Man? Because many breeding techniques, such as artificial insemination, in vitro fertilization and embryo transfer, have already made their way into medicine, there are some who fear it may not be long until the manipulation of animal traits will extend to human traits as well.

''Important legal, constitutional and policy issues were raised by this decision,'' said Representative Robert W. Kastenmeier, a Wisconsin Democrat who heads the House Judiciary Subcommittee on Courts, Civil Liberties, and the Administration of Justice, which will hold the hearing Thursday on the Patent Office ruling.

The commercial applications of genetic engineering are already apparent. Sales of genetically engineered products, most of them new pharmaceuticals, have almost doubled annually in recent years and topped $350 million last year, according to industry analysts. The Congressional Office of Technology Assessment has identified almost 400 companies seeking to develop products with genetic engineering and other modern biological technologies. More than $3 billion, two-thirds of it provided by the Government, will be invested this year in biotechnology research, according to the General Accounting Office and industry analysts.

Yet as the ambitions and accomplishments of genetic engineering increase, awareness of its power and potential is generating a mixture of fascination and hope, aversion and misunderstanding.

A survey of 1,273 American adults published in May by the Congressional technology office found that while a majority of those interviewed believed that the potential benefits of genetic engineering outweighed its risks, they were disturbed by some applications, particularly the release of manufactured life

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1987 The New York Times, June 8, 1987

forms into the environment and manipulations in human embryos. Sharp Disagreement Over Possible Dangers ''People understand at a gut level that there is something wondrous, and perhaps perilous, about a technology that changes the blueprint of life and will force us to make choices that are likely to be more profound than anything we, as a society, have ever faced,'' said Senator Albert Gore Jr., a Tennessee Democrat who has studied the biotechnology industry.

Though scientists generally agree the field offers great promise, there is sharp disagreement over its potential perils.

''We are bringing a completely human-centered utilitarian attitude toward life,'' said Dr. Michael Fox, a veterinarian and scientific director of the Humane Society of the United States. ''All of earth's living things will simply become items to exploit.''

Other scientists and many biotechnology industry executives insist that genetic manipulation will hasten the development of cures for diseases like AIDS, lead to solutions for toxic chemical pollution, produce a new agricultural cornucopia and open an industrial era based not on fossil fuels and chemicals, but on new, non-polluting substances produced by genetically engineered plants or microbes.

APD

Genetic engineering was recognized as a momentous development in 1973, when Stanley N. Cohen of Stanford University and Herbert W. Boyer of the University of California at San Francisco snipped a piece of the genetic code out of one bacterium and inserted it into another.

But that experiment was followed almost immediately by a host of safety and ethical questions, many of which remain unresolved. Are living, gene-altered microbes safe to release outdoors? What is the best way to assess the risk from such uses? Is it ethical to alter the genetic codes of animals? What about people? How can a society know whether a new technology should be pursued or ignored?

''The issues range from ethics within universities, to the environment, to eugenics, to definitions of nature, to religious thought, to what it is to be human,'' said Dorothy Nelkin, a professor in Cornell University's Program on Science, Technology and Society. ''Other disputes over technology have been much simpler and mostly focus on health concerns.''

Rearranging Gene Chemicals

The source of the excitement and the conflicts is a technique, conceptually simple but in practice quite complex, for rearranging basic hereditary material: the deoxyribonucleic acid, or DNA, that makes up genes.

DNA molecules are long, twisted ladders of chemicals called nucleotide bases: adenine, thymine, guanine and cytosine. More than 30 years ago, scientists determined that adenine always pairs with thymine, and cytosine with guanine. These chemical connections are called base pairs; a single gene, a section of DNA, is typically made up of 10,000 to 20,000 base pairs. Human beings, it is estimated, have between 100,000 and 200,000 genes, or up to 4 billion base pairs, organized on 46 chromosomes.

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1987 The New York Times, June 8, 1987

Though the numbers of genes in mammals, plants, and microbes differ, their ladder-like molecular structure does not. Scientists are now able to identify and isolate specific genes and remove them with proteins, called restriction enzymes, that slice DNA in specific places. The enzymes cause the pairs on either end of the gene to split, leaving nucleotide bases without corresponding mates. Scientists call the unpaired bases ''sticky ends'' because, seeking the correct chemical fit, they easily merge with another organism's genetic structure.

Yet simply isolating a gene from one animal and plugging it into another does not mean that the gene will produce the desired result. A gene's functions are determined by its location on a chromosome, the workings of neighboring genes and other factors that are still mysteries. Current Limitations And Possibilities So far, genetic engineers are largely limited to transferring single genes into microbes, plants and animals, or taking single genes out of bacteria and viruses. Alterations involving more than one gene, such as creating crops that produce their own insecticides and fertilizer, or cows that produce medications in their udders instead of milk, are still years away.

Assertions that genetic engineering will produce unrecognizable plants or monstrous animals are considered by many researchers to be scientifically absurd.

''There are severe limits to the extent of the modifications we can make,'' said Dr. Bernard D. Davis, a microbiologist at Harvard Medical School. ''If you mix genes from genetically distant organisms that don't fit each other well, you will not have an organism that can live.''

''We're not going to make weeds out of non-weedy species,'' said Dr. Winston Brill, vice president of research and development at Agracetus, a plant biotechnology company in Middleton, Wis. ''We're not going to have Frankensteins crawling around.''

Nevertheless, transfers involving a single gene can yield striking physiological changes.

A Pig Unlike Any Other

For example, the transgenic pig, a rust-colored boar born last November at the Department of Agriculture's experiment station in Beltsville, now weighs as much as its natural cousins; unlike them, little of its bulk is fat. But it has trouble walking on short legs swollen by arthritis. Its eyes, peering from a broad and wrinkled face, are slightly crossed. If it is like its father, who was one of the world's first transgenic farm animals, it will not live to be 2 years old.

Nothing about producing transgenic animals is easy. Genes are injected into fertilized animal eggs. Piercing cell walls kills between half and three quarters of the eggs, said Dr. Vernon G. Pursel, the research physiologist conducting the swine experiments. In four years, scientists injected more than 8,000 fertilized eggs to produce just 43 transgenic pigs.

It is little wonder, then, that researchers at Beltsville consider the birth of the rust-colored pig to be a scientific success. The young boar inherited the gene that scientists inserted into its father, and the gene expressed itself.

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1987 The New York Times, June 8, 1987

Scientists are now working to control the gene so that it produces animals that grow fast, eat less, and produce more lean meat, without the complex of crippling diseases afflicting the boar.

The Foundation on Economic Trends, a small public policy group that opposes genetic engineering, and the Humane Society of the United States unsuccessfully filed suit in Federal Disrict Court three years ago to halt the research that produced the rust-colored boar's father. They said the research was cruel, violated the innate dignity of animals and would have significant social and economic effects by producing bigger, more expensive animals that would cause dislocations in the farm economy.

''That kind of scientific reductionism undermines the respect for life and future generations will come to regret it,'' Jeremy Rifkin, president of the foundation, said recently.

The two groups are also protesting the new Patent Office policy. In this battle they are joined by farm organizations, consumer groups, environmental groups and most major animal welfare groups.

''Farmers believe they will be facing fewer choices in terms of breeds available to them and will be paying far more for animals,'' said R. Keith Stroup, legal counsel for the League of Rural Voters, a family farm advocacy group that opposes the policy. ''There's another issue here, too. Most farmers who deal with animals on a day-to-day basis want to be very thoughtful and careful about tampering with life. Clearly we have not explored fully the repercussions, morally and ethically, of what these patent applications seek to do.''

Fifteen applications have been filed, but the office does not release descriptions of patent proposals until they are approved.

Dr. Pursel said he was sensitive to the protests but unsure how to respond. ''We are not doing anything out here that is cruel,'' he said, adding, ''The research could have a tremendous practical value.''

Less Invasive Applications

Other applications of genetic engineering technology are less invasive and also less divisive. Scientists have discovered several methods for moving bacterial and viral genes into plants to make them more resistant to insects and diseases. Field tests were conducted last year in Wisconsin, North Carolina and Mississippi and this year in Missouri without protest.

Researchers at the University of California at Davis are working to develop plants that produce their own fertilizers. Around the country, scientists are studying genetic manipulations to increase the rate of photosynthesis to hasten plant growth.

In the pharmaceutical industry, four drugs produced by genetically engineered bacteria have been approved by the Food and Drug Administration. The agency has been asked to approve another new drug made by genetically altered bacteria, tissue plasminogen activator, to be used in treating heart attacks. Its manufacturer, Genentech of South San Francisco, predicts that sales of the drug could reach $800 million a year. Genentech has also inserted human genes into

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1987 The New York Times, June 8, 1987

bacteria to produce insulin, growth hormone, and alpha-interferon, which is used to treat hairy cell leukemia.

Until recent weeks, the most raucous battle in biotechnology focused on releasing living, gene-altered bacteria outdoors. Two field tests in California in April had been delayed three years by protests and challenges and then were marred by vandalism as a result of initial scientific concerns that the microbes would spread beyond the test site. They did not. Implications for Change In Human Genetic Code The conflict took a new turn in April after the Patent Office decision to patent new forms of animal life, a ruling some opponents of genetic engineering characterized as a rifle shot at the human genome.

It is already possible to detect some of the 3,000 genetic diseases. It will be possible, scientists say, to cure genetic disorders by removing or adding genes. But what should the proper limits be for intervening in the human genetic code? Is asthma a genetic disease, and should that be cured genetically? What about baldness? And if diseases are curable genetically, that may also mean that traits could be added to the human genetic code, such as hair color or height.

Since 1975, the National Institutes of Health has refused to provide funds for research involving human embryos or fetuses. Senator Gore, vice chairman of the two-year-old Congressional Biomedical Ethics Board, said the panel was planning hearings on whether such grants should be reinstated.

Like every other twist in genetic engineering, the patenting of higher life forms is certain to heat emotions and generate contention among scientists. The technology is powerful and complex; if allowed to blossom, it could enable people to make direct genetic choices for their offspring and begin to determine human evolution.

GRAPHIC: diagram (page A17); photo of Dr. Vernon G. Pursel (NYT/Paul Hosefros) (page A17)

TYPE: Series

SUBJECT: BIOLOGY AND BIOCHEMISTRY; SURVEYS AND SERIES; GENETIC ENGINEERING; ETHICS; RESEARCH

NAME: SCHNEIDER, KEITH

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

5TH STORY of Level 1 printed in FULL format.

Copyright (c) 1977 Time Inc. All Rights Reserved;
Fortune

December, 1977, Domestic Edition

SECTION: Pg. 76

LENGTH: 3965 words

HEADLINE: NEW COMPANIES THAT BEAT THE ODDS

BYLINE: by Gene Bylinsky; Research associate: Alicia Hills Moore

HIGHLIGHT:
Starting high-technology ventures has never been tougher, but the best of them still succeed.

BODY:
In 1973 a highly inventive young British chemist named John Peers figured out how to build a small computer that could be instructed, not in one of those convoluted computer codes misnamed "languages" but in plain English, or any other human tongue. An entrepreneur as well, Peers was already running his own computer-manufacturing company in London, so he had the means to make some models of his novel machine. But 1973 Britain was the worst imaginable place to turn his revolutionary idea into reality. A slowdown strike in the coal mines, coming on top of the Arab oil embargo, had nearly knocked out the British economy. Electric power, for instance, was available only every other four hours a day. An ardent believer in free enterprise, Peers sold his firm -- the third he had founded -- and set out for that promised land of high technology, the famous complex of nearly 1,000 science companies in Santa Clara and San Mateo counties just south of San Francisco.

Some initial hardships awaited him there. Working without pay in cramped rented quarters in Burlingame, California, Peers and half a dozen confederates constructed his dream computer, christened it Adam, and then told all those vaunted local venture capitalists that they could help launch Adam into a waiting world. "We talked to thirty or forty of them," Peers recalls, "and received every kind of support imaginable -- except money." Stock prices were crumbling, and the investors had retrenched. Besides, they were hestitant to support a sharp departure from "normal" computer programming.

Now they're knocking on his door

Undaunted, Peers raised $650,000 from other sources: a surgeon in Florida, a real-estate man in Los Angeles, a well-to-do family in San Francisco. Today, Adam is a smash hit with first-time computer users. Peers's company, Logical Machine Corp. of Sunnyvale, California, has sold nearly 350 Adams at about $35,000 each and has been profitable for two years. Now the venture capitalists are pounding on John Peers's door offering money to invest, and it is his turn to say no. He is equipping Adam with an optional voice-command system, the next step in his plan to make computers so easy to use that they can be sold "like motorcars." Toward that end, Peers has just acquired Byte, Inc., a supplier of microcomputer systems and accessories to the Byte Shops, a nationwide chain of computer stores. He estimates the potential market for Adam at 1.3 million machines -- not such an outlandish vision in light of the explosive growth of

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1977 Time Inc., Fortune, December, 1977

the small-computer market and the savings that can be realized by the elimination of expensive prepackaged software. Many computer specialists think that Adam's arrival signals the beginning of the end of conventional computer "languages" in almost all business applications.

To be sure, communicating with Adam via a typewriter-like keyboard is like teaching one of those bright but obviously limited chimpanzees that scientists have been instructing in symbolic languages. A user has to define his program steps in great detail. But he is doing it in his native tongue, a big breakthrough compared with the use of computer codes. One I.B.M. programming expert calls the ability to program in natural languages "revolutionary."

The story of John Peers and his Adam makes two important points about the state of new-enterprise formation in this country: the game has never been so tough, and yet dozens of promising new companies have made their way into being and even into the black. As John Peers puts it: "The hard way is really the easy way." He means that a true entrepreneur thrives on difficulties and in overcoming them builds a sounder company than he would have if lavishly financed.

There are plenty of troubles for Peers and his fellow entrepreneurs to thrive on these days. It's more expensive to start a new company because of inflation and burgeoning government regulations, and at the same time the rewards for the entrepreneurs have decreased substantially. "The carrot has gotten smaller," as one of them puts it. It is much harder for new companies to go public in a stock market that seems not to have recovered from the recent recession, and higher taxes on stock options and capital gains make it difficult for company founders and their principal associates to reap a payoff for the risks they take.

As John Peers learned, these discouraging developments have driven away the venture capitalists who once specialized in bankrolling new enterprises. They got out of the game in the 1974 bear market -- when only two high-technology companies with a capitalization of more than $1 million managed to raise the money to go into business -- and many of them never returned.

Still, despite all, a FORTUNE survey of new high-technology companies in California, in the Boston-Cambridge area, and elsewhere in the country, indicates that the entrepreneurs never gave up, even in the midst of the bleakest season for venture capital. They have continued to form significant companies in such traditionally fastgrowing fields as electronics, energy, and medicine, as well as in the brand-new area of microcomputers for hobbyists and small businesses.

Having lost venture capitalists as a main source of financial support, the entrepreneurs have scrambled for money wherever they could find it. Some got it at established companies that were interested in taking a flier in a new field. Others drew on their own savings and on their families and friends. Often, the venture capitalists were willing to come in on the second or third round of financing when the new company needed more money to expand.

A "fail-safe" computer for banks

There are notable exceptions, of course. Undeterred by the gloomy economy of 1974, San Francisco venture capitalists Eugene Kleiner and Thomas Perkins

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1977 Time Inc., Fortune, December, 1977

founded Tandem Computers Inc. that year to make a "fail-safe" computer with dual processors for use by banks, hotels, airlines, and other businesses where computer failures can be costly. The company has been so successful that it is in the process of going public, one of the few companies able to do so.

A group of venture capitalists, including Idanta Partners of San Diego and Greylock Management Corp. of Boston, put a total of $3.6 million during 1972 and 1973 into Prime Computer, Inc., of Framingham, Massachusetts, after the founders ran out of money. It turned out to be a wise investment: the company, which makes powerful small computers, has been highly profitable since 1974 and has emerged as probably the fastest-growing new computer company in the country.Only five years old, it expects to report sales of about $50 million this year.

Some successful entrepreneurs can well afford to fund new projects themselves. In Palo Alto, Dr. Robert N. Noyce, chairman of Intel Corp., teamed up with two former executives at Memorex Corp. to launch Arbor Laboratories, a successful manufacturer of computerized balance scales. In Nashua, New Hampshire, Harlan Anderson, co-founder of Digital Equipment Corp., helped start Termiflex Corp., which makes hand-held computer printers. And in Irvine, California, Robert A. Kleist, who calls himself a "scientific businessman," left his second successful company, Pertec Computer Corp., to found a third, Printronix, Inc.

The company's novel computer printer, first built in the proverbial California garage, forms characters electronically and reproduces them on paper as tiny dots that merge into one another. The mechanism can also serve as a plotter, to make charts, graphs, and other such visual displays.

Kleist and his friends backed up their technological innovations with an imaginative marketing strategy. Though the professional investors they approached all advised them to go after big customers with many different printer models, Kleist and his associates, relying on their own experience and intuition, went in the opposite direction. The strategy of his newest company, Kleist said, would be "concentration, innovation, and perspiration." Printronix produced just one model, but one packed with a lot of features that appealed to many different customers.Kleist's printer, for instance, could be utilized not only in business offices but also in warehouses and food stores, where it could prepare labels and bar codes for groceries and other consumer items. "A little company," says Kleist, "can't succeed by doing many different things."

Copycats fail

Kleist's second key decision was to sell his $5,000 machine through distributors -- an unusual approach in his industry -- and thus acquire at a stroke a sales force five times as large as his biggest competitor. Printronix didn't sign up its first big customers until it had 1,000 printers in the field, two years after the company was started. "We effectively created our own class of large customers by aggregating a lot of little customers under a regional distributor," says Kleist. "If you do everything like a big successful company, you'll never get to be a big successful company."

From the vantage point of success, Kleist is delighted that he was rebuffed by some eighty venture-capital outfits, ranging from wealthy individuals to bank subsidiaries. He and other managers and employees of the company put up the initial $670,000, and they raised another $550,000 by selling licenses abroad.

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1977 Time Inc., Fortune, December, 1977

Two venture capitalists chipped in $280,000 after Printronix was in the black, but they own only 17 percent of the shares and aren't on the company's board. Kleist is selling 300 printers a month now and expects sales to reach $30 million to $50 million a year within three years.

Other entrepreneurs have gone to established companies for financing. Two recent emigrant engineers from the Soviet Union, Naum Staroselsky and Alexander Rutshtein, started Compressor Controls Corp. in Des Moines with the help of Ladin In-dustries, Inc., a small textile company. Dr. Frederico Faggin, who came from Italy in 1968 and helped design the first microcomputer, left Intel Corp. in 1974 to start his own microcomputer firm, Zilog Inc.; it has been backed handsomely by Exxon's venture-capital arm (see "Exxon Has Its Eye on More Than Oil," FORTUNE, April). Still other new companies have reached out for foreign funds, particularly Japanese -- a trend that venture capitalists decry for fear of setting off a technology drain.

Whatever the source of their support, the new companies are succeeding -- as Logical Machines and Printronix did -- by exploiting gaps in the market, or by creating entirely new markets. Nowhere is their success more evident than in the rapidly growing homecomputer field, which didn't even exist a few years ago. Many small companies are offering complete microcomputer systems for as little as $300.They are being used by gad-get-loving homeowners to control lights, furnaces, and appliances, to design electronic games, to help children with their homework, and to balance the family budget.

Miniaturizing electricity bills

As this boom has spread, all sorts of dead-serious customers have begun stopping by the Byte Shops and other computer stores that have sprung up around the country. Microbusinessmen -- dentists, gas-station managers, owners of small retail shops -- have learned how to use microcomputers as a powerful new tool. Typically, a technical consultant for the Computer Shoppe in Metairie, Louisiana, designed the program and communications system to go with a $1,400 microcomputer that controls heat and air conditioning in the thirty-two-story International Trade Mart in New Orleans. Last year, the building had a $600,000 electricity bill. This year, the Trade Mart's microcomputer system will lop more than $200,000 off that bill.

One of the small new companies fueling the microcomputer boom is Imsai Manufacturing Corp. (Imsai stands for Information Management Systems Associates, Inc.), of San Leandro, California. It was founded in 1973 by William Millard, a specialist in computer software. When its largest customers -- several G.M. car dealers -- asked Imsai to develop and install a computerized system to process orders and do other such office work, Imsai agreed but soon discovered that it had grossly underbid the contract. It was headed for some big losses if it bought the Digital Equipment minicomputers it had intended to use.

Forced to be inventive, Imsai developed a microcomputer system that did the same job for much less money. Then the company decided it could sell the microcomputer in kit form to hobbyists at $399 each. It wasn't prepared for the response. In the last eighteen months, Imsai has sold over 10,000 microcomputer kits, mostly through mail order. Fascinated by this rapid growth, one of Imsai's car-dealer customers helped finance the expansion with a long-term loan.

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1977 Time Inc., Fortune, December, 1977

Imsai found a lucrative market in the computer stores, which were eager to expand their line. Imsai obliged by offering complete microcomputer systems, incorporating printers, video-like displays, and so on.

Expressly for railroaders

"We've watched the stores over the months since then," says Wesley T. Dehn, Imsai's general manager. "Essentially, a new layer of business is being computerized. The traditional minicomputer companies started at the top and are now descending down the ladder to smaller companies, but they are still basically marketing toward a real corporation -- a small manufacturing company, maybe a machine shop that has thirty or forty employees. The stores, however, are selling to local businessmen who may only have two or three employees. When people think of small business, these aren't the pictures that pop into their minds. These are the businesses you see when you drive around town."

Imsai is catering to this new market with a self-contained microcomputer that looks like a terminal and sells for $5,000 to $10,000.It is also continuing to compete in the hobby market, offering, for example, a microcomputer for model railroaders -- the Imsai Express. The company is also talking to homebuilders who would like to incorporate a $200 to $300 microcomputer in new homes to control heating, lighting, and other such functions.

"One of the things that made us successful," says Dehn, "is our closeness to the market. Three months after spotting a trend we are shipping a product while someone in a larger company may be thinking about writing a report."

That same strategy of moving fast where bigger companies plod along has helped Haim Brill, thirty-nine, build up a rapidly growing company in the somewhat esoteric field of magnetic-tape controllers for computers. Brill came from Israel thirteen years ago and was working for a Boston-area electronics concern when he spotted a better way of linking computers with their peripheral equipment. He struck out on his own a year ago. "Like most new companies," says Brill, "we provide a new, more economic solution to an old problem."

Brill employs the latest semiconductor and microcomputer technology in his controllers, enabling his company, Aviv Corp., to compete against larger firms. "I've done it all by myself," says Brill. "Sometimes it is very lonely, but all the arguments I have, I have with myself."

Aviv so far has just four employees, including Brill, who often works seven days a week. Sometimes he is at the office all alone, filling a rush order at midnight. "It's a hard road," he says. "But it's like an addiction, you just can't stop."

A tip from the Shah

Another enticing field for the entrepreneurs is energy-saving technology, and here, too, some interesting companies have been formed in recent years without initial help from venture capitalists. One such new enterprise, Enviro Development Co., Inc., of Mountain View, California, came into being because Robert J. Sherwood, a young engineer, happened to be in Iran in December, 1973, when the Shah announced the first in a series of big hikes in the price of oil. Sherwood was then European division manager for Envirotech Corp., a conglomerate that sells pollution-control and mining equipment, and he understood at once

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1977 Time Inc., Fortune, December, 1977

that American technology for waste-water treatment, based on an abundant energy supply, had suddenly become outmoded.

Europeans, on the other hand, had geared their water-treatment technology to Europe's higher energy costs. Sherwood saw a market back home for this equipment, which produces a form of sludge that can be used as fuel. He and a colleague at Envirotech, Matthew M. Zuckerman, a Ph. D. in environmental engineering, resigned to start a new company whose aim was to cut the power costs of water treatment in the U.S. by half and to reduce the fuel costs to zero.

They put in $40,000 of their own money and raised another $35,000 from friends and relatives. After a fruitless search for venture capital, they decided that Enviro Development would have to pay its own way. They licensed or purchased enough equipment to get started, modified it for the American market, and began to bid on water-treatment contracts.

Industrial customers and municipalities have been so receptive to these energy-saving devices that Enviro Development will have sales this year of about $8 million -- and hopes to see them soar next year to about $15 million to $20 million. To allow for expansion -- the company now employs eighty-five people -- Enviro Development has received an infusion of $500,000 from that San Francisco venture-capital firm, Kleiner & Perkins, which approached the company last January.

One secretary and a telephone

Another new company in the energy field has had rougher going. Isothermics, Inc., of Augusta, New Jersey, was started in 1971 by Richard L. Pessolano, a former aerospace engineer who decided to commercialize the heat pipe, an efficient thermal conductor perfected in atomic-energy research.

The heat pipe basically is an evacuated, hermetically sealed metallic cylinder, lined with a capillary wick structure made of wire screen or cloth, and filled with a working liquid. The liquid can range from water to molten silver, depending on the desired temperature range. The heat pipe has no moving parts, requires no external energy except for the heat it transmits, and is completely silent. Heat is transferred by the vaporizing and expanding liquid inside the pipe. The vapor moves to the cooler end of the pipe, where it condenses, and is returned to the hot end by the capillary action of the wick. In short, the heat pipe is a simple and reliable device that offers a compact, transistor-like way to transfer heat. Its efficiency is remarkable: a heat pipe can conduct about 1,000 times more heat than a copper rod of the same diameter, and with a very small temperature loss.

While working for a number of big aerospace concerns, which built heat pipes for spacecraft, Pessolano could see that those companies were neither equipped for nor interested in commercializing the device. So he struck out on his own. He raised $70,000 from local investors and started Isothermics with a secretary and a telephone.He spent a week at the U.S. Patent Office in Washington, D.C., looking for ideas about ways that heat pipes could be used.Pessolano found that most heat-pipe technology wasn't covered by patents and so could be exploited by anyone.

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1977 Time Inc., Fortune, December, 1977

Isothermics soon had three different consumer products on the market. The first was a cooler for motorcycle oil, a slender copper heat pipe that replaces the conventional dip stick. It transfers heat from the oil to knurled aluminum fins that project into the airstream. The second product was a cooking pin. When inserted into a roast, it reduces cooking time by almost half. The third product was a unit that reclaims heat wasted in home furnaces. It fits into the flue, where it captures heat and transfers it to an air duct outside the flue. A fan directs the stream of warm air to nearby rooms.

These smaller products caught on well, even though at the time Isothermics developed its unit for home furnaces few people were interested in saving energy. Since then, the company has also gone into the industrial market, providing energy-saving devices for such varied installations as office buildings, paint-bake ovens at automobile plants, and a military missile base.

Despite its success, Isothermics has had a difficult time raising funds needed for expansion.After Pessolano unsuccessfully approached a number of venture capitalists in New York City, he in turn was sought out by five different Japanese companies looking for energy-saving devices. Pessolano then sold 28 percent of Isothermics to Marubeni America Corp. for $500,000. Another $200,000 came for a license granted a Marubeni subsidiary. Marubeni has also come through with a $500,000 loan. Isothermics has been doing so well lately that Pessolano has bought back some of the stock from the original investors, paying them three times their purchase price. He thinks that in two years his company will become a big success -- barring entry of large firms into the field.

Splicing genes for profit

New companies are being formed today even in the always difficult biological area. Collagen Corp. of Palo Alto, founded by two research physicians from the Stanford Medical School, is developing novel means of treating wounds with proteinlike substances used as salves. Genertech (for Genetic Engineering Technology) of San Francisco will splice genes to generate new products from restructured bacteria.

This company was started by Robert A. Swanson, a young organic chemist who also has an M.B.A. from the Sloan School at M.I.T. Swanson had worked for venturecapital firms but quit last year to set up Genentech. He made a list of key scientists in the field and then started talking with them. Topping his list was the name of Dr. Herbert Boyer, a University of California biochemist.Swanson founded the company with Boyer as a consultant, and venture capitalists Kleiner and Perkins came in as investors shortly thereafter.

While profits are years away, the field is full of promise. Recently, for example, Genentech financed a research program in which Boyer and other West Coast scientists programmed E. coli bacteria to produce a brain chemical, somatostatin, which controls the body's manufacture of insulin and growth hormone. Dr. Philip Handler, president of the National Academy of Sciences, described this breakthrough as "a scientific triumph of the first order."

Survival of the fittest

Despite recent successes, the atmosphere in which all these entrepreneurs have operated is unquestionably less encouraging than that of the 1960's when

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1977 Time Inc., Fortune, December, 1977

new companies proliferated. Those venture capitalists who still back start-up enterprises are apt to bet their money on proved scientific businessmen who have formed successful companies before. This, of course, limits the opportunities for untried innovators.

Once a new company gets on its feet, it may need new capital for expansion, and since few enterprises can go public, many face the choice of either stagnating or selling out to large corporations. That limits competition in new fields.

Whatever the obstacles, the most talented of the entrepreneurs will find ways to win. As the veteran San Francisco venture capitalist Arthur Rock puts it: "There will always be the Max Palevskys, the Bob Noyces, and the Gene Amdahls. If they are good people, you're just not going to stop them." Because the best of the breed is good at clearing hurdles does not, of course, mean that the hurdles -- such as burdensome regulations and punitive tax schedules -- are good for society.

GRAPHIC: Picture 1 thorugh 3, Both scientist and salesman, John Peers, the founder of Logical Machine Corp., staged a "Whistle-Off" to demonstrate the lifelike qualities of his computer, Adam. At the finale in Carson City, Adam whistled a rather shrill version of "My Way." All the contestants defeated the machine, "which made them all happy, and made us happy," says Peers.; Picture 4, no caption, Marvin Lichtner; Picture 5, no caption; Picture 6, Thinking small has worked for Haim Brill. His Aviv Corp., which has just four employees, makes a miniaturized controller that links a computer with its surrounding electromechanical devices. Israeli-born, Brill started Aviv with about $50,000 of his own and family money and will have sales this year of $700,000. The headquarters is in Bedford, Massachusetts, on the Hayden estate, which has served as a nursery for a number of high-technology companies, including the missile division of Raytheon. Co Rentmeester; Picture 7, An aerospace engineer, Richard Pessolano spotted commercial possibilities in the heat pipe, an efficient device used in spacecraft and nuclear reactors to conserve and transfer heat. Pessolano founded Isothermics, Inc., which quickly became profitable. It makes heat pipes for use in home furnaces and industrial installations. Co Rentmeester; Picture 8, A budding capitalist from Russia, Naum Staroselsky, was one of the Soviet Union's top experts in control devices for compressors. He emigrated to the U.S. four years ago and started Compressor Controls Corp. in Des Moines. At right is Lawrence Ladin, president of Ladin Industries, Inc., a Des Moines textile company that financed Staroselsky's venture. Behind them is a facility of Northern Natural Gas Co. in Ventura, lowa, where one of the new devices controls the flow of natural gas. Co Rentmeester

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

1ST STORY of Level 1 printed in FULL format.

Copyright (c) 1990 The Times Mirror Company;

Los Angeles Times

October 21, 1990, Sunday, Home Edition

SECTION: Business; Part D; Page 3; Column 1; Financial Desk

LENGTH: 1971 words

HEADLINE: A DOGGED INVENTOR MAKES THE COMPUTER INDUSTRY SAY: HELLO, MR. CHIP; TECHNOLOGY: IN 1968 GILBERT HYATT APPARENTLY INVENTED THE COMPUTER ON A CHIP. ARMED WITH A PATENT AT LAST, HE AIMS FOR ROYALTIES -- AND RECOGNITION.

BYLINE: By DEAN TAKAHASHI, TIMES STAFF WRITER

BODY:

In 1968, much of the world was in turmoil. Thousands died in the Tet offensive in Vietnam. Russian tanks rumbled into Czechoslovakia. Robert F. Kennedy and Martin Luther King Jr. fell to assassins' bullets. Police clashed with demonstrators in Chicago.

But Gilbert P. Hyatt distanced himself from the turbulence. The 30-year-old electrical engineer was absorbed with another matter: Designing a computer to fit on a silicon microchip no bigger than a fingernail.

Risking his family's savings and security, Hyatt quit his well-paying job as a research scientist at Teledyne Inc. and retreated to his Northridge home. In the family room, alone, seven days a week, he tinkered with homemade electronics hardware.

An idea emerged. And though the design was never specifically used to produce a chip that powered an electronic gadget, Hyatt is now asking the world to recognize him two decades later as the inventor who made the computer revolution possible.

In July, after a 20-year legal fight that generated an estimated 10,000 pages of paperwork, the U.S. Patent and Trademark Office gave Hyatt patent No. 4,942,516 for a "Single Chip Integrated Circuit Computer Architecture." The patent shocked the electronics world.

If it withstands legal challenges, it could establish Hyatt as the father of the "computer on a chip," or microprocessor, the technology that spawned modern wonders of electronics from pocket calculators to microwave ovens. It could also earn him millions of dollars a year in royalties.

"I didn't invent the computer, but I came up with a very good improvement," said Hyatt, a 52-year-old workaholic who prefers to work alone at a modest home in a cul-de-sac in La Palma. "My work in those days led to the PCs of today."

Depending on the viewpoint, Hyatt is either an underdog who battled greedy investors to keep control of his technology, or a frustrated scientist who couldn't bring his ideas to fruition in the marketplace and so exploited the patent system instead.

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1990 Los Angeles Times, October 21, 1990

Among those who begrudge Hyatt a place in history are former Intel Corp. researchers Marcian E. (Ted) Hoff and Federico Faggin, who along with engineer Stan Mazor are credited with inventing the first commercial microprocessor between 1969 and 1971.

Another inventor, Gary W. Boone, an ex-Texas Instruments engineer, also has been given recognition because he was awarded the first microprocessor patent in 1973 -- three years after Hyatt filed for his patent.

But Hyatt contends that he is the true inventor of the microprocessor and the technology "leaked out" to the industry through investors. He also says that patents awarded to Intel and TI cover only limited microprocessor improvements that were product specific.

"The patent office did a very thorough job before they issued the patent," he said. "That is why it took 20 years."

The competitive atmosphere in the microelectronics industry in the 1960s was similar to the race between the United States and the Soviet Union to send a manned spacecraft to the moon. Electronics companies were going all out to build chips with consumer uses.

change

The semiconductor chip had been invented a decade earlier by engineers Jack S. Kilby at TI in Dallas and Robert N. Noyce, then at Fairchild Semiconductor in Silicon Valley. With the chip, the components of a complete electronic circuit were built on a single slice of silicon.

Still, computers built from the chips stood several feet high, mainly because of the huge core memory they held on reels of magnetic tape. They could control missiles, but were too big for consumer goods such as watches. Something smaller was needed.

Like the technology, the electronics industry itself was in flux. Noyce and Gordon E. Moore left Fairchild to form Intel in July, 1968. Other researchers left companies such as TI or Motorola Inc. to be entrepreneurs.

Hyatt also decided in 1968 to form his own company, but he followed a different path. He avoided the professional circles of researchers in the emerging Silicon Valley in Northern California.

"They all knew each other, but they didn't know me," he said. "It was essential I get away from them and do my own original thinking."

Those who knew him at the time describe Hyatt as slender, mild-mannered and a bit naive for his age. He could be impatient with people who didn't understand his ideas. The son of a civil engineer, Hyatt knew from an early age that he wanted to be an engineer.

After undergraduate study at UC Berkeley and graduate work at the University of Southern California, Hyatt took a job as a research scientist at Teledyne in 1966. But his ambitions lay elsewhere.

The idea for a computer on a chip evolved over many months after Hyatt began tinkering with designs in his spare time in 1967. He quit his job at Teledyne in early 1968 to devote himself to the project.

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1990 Los Angeles Times, October 21, 1990

Using technology mostly available on the market, Hyatt believes he was the first to put all the pieces together with a design for a small single-chip computer that bucked the industry trend of building ever-bigger computers with high-capacity memories.

"All products are built on technologies of the past," he said. "Only God can create from nothing."

Hyatt decided computers could perform relatively simple tasks with far less memory than the room-sized models needed. He chose a compact component known as read-only memory, which could be programmed once with the basic instructions telling the computer what calculations to make. It would work with another memory component called an alterable scratch-pad memory, which could store the data that was subject to change with each computation. Both were small enough to fit on a chip.

In July, 1968, Hyatt trademarked the term "Micro Computer" for the invention. In November, he created a working "breadboard," or an oversized prototype that demonstrated the chip's circuitry.

John Salzer, a Santa Monica management consultant, recalled that he was so impressed with Hyatt's chip design that he invested $5,000 in the company.

In March, 1969, attorney Stuart Lubitz agreed to find more investors for Hyatt and filed incorporation papers for Micro Computer Inc. a month later.

Irving Hirsch, a friend and veteran manager of several small technology firms, joined Hyatt as a partner and invested $60,000 in Micro Computer. Hirsch became president of the company, which moved to an office in Reseda and began hiring employees.

"Hyatt was a very hard worker and one of the most brilliant guys I've run into," said Hirsch, 68, now owner of a lighting distribution firm in Inglewood. "We operated seven days and nights and he was there constantly. We used to work at my house in Woodland Hills and take walks at 1 a.m. or 2 a.m. and talk about the technology."

Hirsch and Hyatt knew the firm would need about $1.5 million, so they asked Lubitz to search for more investors. Lubitz rounded up a group that included Intel founders Noyce and Moore.

Other investors included Hale Bros. in San Francisco and the San Francisco investment firm of Hambrecht & Quist.

Lubitz served on the board of directors, as did Hirsch, Hyatt, Joseph Chulick Jr. of Hambrecht & Quist, and a Hale representative.

With the venture capital backing, the company moved to Van Nuys in 1970, hiring 25 workers.

But a battle was brewing. Hyatt filed a patent application for the computer on a chip on Dec. 28, 1970. Working through Lubitz, the investors tried to persuade Hyatt to give up rights to the technology if the company closed or was sold, Hyatt and Hirsch recalled.

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1990 Los Angeles Times, October 21, 1990

On July 17, 1971, the investors staged a showdown at a board meeting, Hyatt said. He said Lubitz and Chulick tried to badger him into giving up his rights to the technology. When he refused, the investors withheld their funding.

"I think the investors decided the technology was too good for Hyatt," Hyatt said. "Their motive was to sell the company and take the technology."

Lubitz, who later worked as a patent attorney for Intel and is now a Los Angeles patent attorney, said Hyatt was a stubborn, impractical researcher without a viable technology who was obsessed with "paper rights." He believes Hyatt's patent has stolen credit from Intel.

"It was a question of whether investors wanted the patents developed with company funds to be assigned to the company," he said. "Mr. Hyatt refused, and that was the end of it. There was never any mention of a computer on a chip."

The firm went out of business in September, 1971. Hyatt contends that the investors then leaked details of the chip to the industry, although he will not elaborate on the evidence to back up that claim.

As Hyatt's dream was unraveling, his rivals were not sitting still.

Between 1969 and 1971, Hoff, Faggin and Mazor at Intel developed a series of four chips that could be sold as a package, including the Intel 4004, a central processing unit on a single chip that before the Hyatt patent was known as the first microprocessor.

TI's product hit the marketplace about the same time.

Intel and TI went on to become industry giants while Hyatt's Micro Computer produced only one prototype for one customer.

"It was frustrating watching people exploit my technology and get rich while I was on the sidelines," Hyatt said.

Unable to find other funding, Hyatt became an aerospace consultant and tinkered with his own inventions at home, eventually collecting more than 50 patents.

But he didn't give up on the patent quest. Hyatt and his attorney, Gregory L. Roth, knew that under patent law, they did not have to build a working microchip, but only prove it could be commercially built from the design.

They had the benefit of the earliest filing date. But they still had to prove the case to patent examiners. Over the next 20 years, Hyatt and the examiners went through 16 different legal reviews.

In June, 1988, the U.S. Court of Appeals in Washington said Hyatt had not proven that any chip maker could have built a working chip based on Hyatt's patent application. However, the court broke a stalemate between Hyatt and the patent examiners by acknowledging that he had solved technological problems that eluded earlier designers.

For the next two years, Hyatt built a case based on published industry literature that the technology had existed to create his chip in 1970. He

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1990 Los Angeles Times, October 21, 1990

found evidence that TI, Intel and other firms could have fabricated the chip if he had directed them to do so.

The patent examiner finally issued the patent on July 17.

Gary Hecker, a Los Angeles patent attorney who examined the patent, said its claims are broad, apparently covering most microprocessors and other computers contained in a wide range of electronic products.

Enforcing the patent could prove time-consuming and expensive. Hyatt has agreed to testify about his invention in a patent-infringement suit between Zenith Data Systems Inc. and TI, which is trying to enforce patents related to Boone's microprocessor work.

Hoff and Faggin, the former Intel researchers, feel cheated by the Hyatt patent.

"I feel we at Intel made a very small, very economical processor that was orders of magnitude cheaper than the minicomputers at the time," said Hoff, a legal consultant in Mountain View. "When you do that, that's when you really achieve a breakthrough."

In rebuttal, Hyatt said his chip would have been marketable if only his investors had backed him.

T.R. Reid, a Washington Post reporter and author of the 1984 book, "The Chip," said that historians may solve Hyatt's case with the same compromise that ended a 10-year dispute between Intel's Noyce and TI's Kilby over the invention of the chip in 1958.

" Kilby got the idea first, but Noyce made it practical," Reid said. "The legal ruling finally favored Noyce, but they are considered co-inventors. The same could happen here."

GRAPHIC: Photo, Inventor Gilbert P. Hyatt with one of his more recent creations. Associated Press

SUBJECT: HYATT, GILBERT; ELECTRONICS INDUSTRY; SEMICONDUCTORS; INVENTIONS; INVENTORS; COMPUTERS; PATENTS

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

3RD STORY of Level 1 printed in FULL format.

Copyright (c) 1990 The Times Mirror Company;
Los Angeles Times

August 30, 1990, Thursday, Orange County Edition

NAME: GILBERT HYATT

SECTION: Part A; Page 1; Column 6; Metro Desk

LENGTH: 1030 words

HEADLINE: CHIP INVENTOR WINS 20-YEAR PATENT FIGHT

BYLINE: By DEAN TAKAHASHI, TIMES STAFF WRITER

DATELINE: LA PALMA

BODY:

Gilbert Hyatt, a slender, bearded engineer, says he would never shoot the two rifles that are mounted over the fireplace in his modest, two-story home on a quiet La Palma cul-de-sac.

But he is not afraid to take steady, dead aim when it is necessary to get what is rightfully his.

"I'm a little guy up against the big guys," Hyatt, 52, said Wednesday.

And this David landed a Goliath of a blow Tuesday when it was revealed that he had been awarded a patent last month for inventing the microprocessor, or computer on a chip. Hyatt had sought the patent, which was issued by the U.S. Patent Office, for 20 years.

The news could turn the computer industry topsy-turvy and make Hyatt wealthy if he is able to collect millions of dollars in royalties from computer-chip makers. It could also earn him a recognition as an inventor who changed the world.

"I am happy that my invention was used to advance technology in so many ways," he said, bearing a permanent blush from the recent media attention. "But it was frustrating without the recognition. This patent has settled everything in my mind."

That is far from certain in many other minds.

The invention of the microchip, which has made most consumer electronic products possible -- from pocket calculators to personal computers to VCRs -- is frequently credited to a team of Intel Corp. engineers that included Ted Hoff, Federico Faggin and Stan Mazor and Texas Instruments Inc.

The Intel team began working on the idea to help a Japanese calculator company in 1969, although Intel's chip was not shipped until 1971. Texas Instruments, through the work of engineer Jack Kilby, also entered the market in the early 1970s.

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1990 Los Angeles Times, August 30, 1990

But Hyatt, who has a stubborn streak honed by two decades of legal battles and industry skepticism, says he is prepared to defend his claims against pretenders and deep-pocket companies that have until now been credited with the microprocessor's development.

Hyatt, who is an independent aerospace consultant and inventor, says he hasn't worked for a big company for 25 years because he fears the environment would "stifle creativity."

The son of immigrant parents, Hyatt was born in New York City and moved with his family to Southern California when he was 16. He attended high school in Long Beach, attended undergraduate school at UC Berkeley and earned a master's degree in electrical engineering from USC.

He showed an early entrepreneurial streak. After working for several small technology companies, he founded Micro Computer Inc. The start-up company obtained venture capital from Hambrecht & Quist in San Francisco and also got backing from Robert Noyce and Gordon Moore, founders of Intel.

Micro Computer grew to 25 employees between 1968 and 1971, but Hyatt said it folded in the midst of a dispute over rights to the technology. He claims to have developed the first microprocessor while working on electronic devices to run machine tools.

To his chagrin, Intel in Mountain View and Dallas-based Texas Instruments received patents for their own versions of the microprocessor in the 1970s and developed market applications for a host of modern electronic gadgets.

Hyatt did not give up, and he filed a patent application on Dec. 28, 1970. He asserted that his invention, first built in 1968, predated the Intel and Texas Instruments devices by several years. Yet he said he was unable to get the product to market.

Stuart Lubitz, a Los Angeles patent attorney who represented Micro Computer until it folded in 1971, faults Hyatt for being stubborn. Lubitz said Micro Computer fell apart because Hyatt resisted imparting the rights to his inventions. "You can't put Hyatt in the same boat with Noyce or Jack Kilby (who co-invented the integrated circuit and the hand-held calculator)," he said. "They were far more successful at advancing the state of the art and were not as obsessed with paper rights."

Hyatt dismisses Lubitz as a representative of jealous competitors. Nonetheless, he acknowledges that he can be difficult. But he said he fights hard to have his patents approved because he believes that they are important inventions.

After a second company he founded folded in the 1970s, Hyatt ran into legal problems that nearly soured him on innovation. In 1978, he was sued by Mattel Inc. for encroaching on two of its electronics-related patents. He lost the suit to have his patents enforced, but a law firm in Washington saved him from financial ruin by picking up his legal costs.

The soft-spoken Hyatt has collected more than 50 patents in a broad range of areas. Much of his work in recent years has involved liquid-crystal display technology.

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1990 Los Angeles Times, August 30, 1990

When not inventing, Hyatt says, he collects Japanese artifacts such as swords, dolls and guns and plays with computers. He is divorced and has raised three children.

Hyatt said he knows the legal battle could continue if other companies challenge the patent's validity. But he said the fight is worth it, and he hopes the recent patent victory will give credibility to other technologies that he is attempting to bring to market.

He said he plans to seek royalties to fund those projects, and he is forming a joint venture with an unnamed company to begin enforcing the patent. He wants to use the money -- which could amount to millions of dollars a year -- for more high-tech developments.

Hyatt said he is not a tinkerer, and he pursues research that he hopes will lead to commercial applications.

"Some inventors just invent, but I try to be broad in my areas of interest," he said. "I consider myself a scientist, an engineer and, in some ways, an entrepreneur."

Despite his travail, Hyatt says he is still excited about the environment for innovation today. And with the help of his patent attorney, Gregory L. Roth, who has argued on Hyatt's behalf for 20 years, and a recently hired publicist, he hopes for more hard-earned recognition and innovations.

"I took a sigh of relief," he said, when asked about his reaction to his patent award, "and went back to work on the new technologies that I'm trying to develop."

WRANGLE EXPECTED: The battle to collect royalties on the microchip lies ahead. D1

GRAPHIC: Photo, COLOR, After a 20-year fight, Gilbert Hyatt, a La Palma engineer, was awarded patent for the invention of the microprocessor, or computer on a chip. MARK BOSTER / Los Angeles Times

TYPE: Full Run; Profile

SUBJECT: PATENTS; SEMICONDUCTORS; COMPUTER INDUSTRY -- ORANGE COUNTYPROPERTY RIGHTS; ROYALTIES; TECHNOLOGY; INVENTORS; INVENTIONS

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

4TH STORY of Level 1 printed in FULL format.

Copyright (c) 1990 U.S.News & World Report

June 18, 1990

SECTION: CURRENTS; ONE WEEK; Vol. 108, No. 24; Pg. 8

LENGTH: 630 words

HEADLINE: Power to the people, etched in silicon

BYLINE: By William F. Allman

BODY:

He was an unlikely revolutionary. A clergyman's son from Burlington, Iowa, Robert Noyce by his own admission was merely being "lazy": Tired of connecting all the wires on the cumbersome circuit boards used in electronic gizmos in the 1950s, the engineer hit upon the idea of crafting a bunch of interconnected electronic components out of a single chunk of silicon -- thereby creating the first integrated circuit. The result was an upheaval that made toasters talk, enriched teenage geniuses and, in the end, re-created the world. Noyce and Jack Kilby of Texas Instruments, who arrived at the same idea independently, helped put information -- the next century's crude oil -- into the hands of the little guy.

Before Noyce, who died unexpectedly last week of a heart attack, computers were hulking beasts that filled cavernous rooms at the Pentagon and a few research laboratories. Crunching numbers with mind-numbing speed, these monsters with their blinking lights were inevitably caricatured as the sinister eyes of Big Brother. And with their creators declaiming that these supremely rational electronic brains would soon surpass the lowly human intellect, the image seemed apt. Here was the possibility of technological evil incarnate: Powerful, unfeeling slave masters controlled by a priesthood of cognoscenti.

By the early 1970s, however, groups like the People's Computer Company and the Homebrew Computer Club had sprung up on the West Coast, filled with radical engineers who believed that computers, far from enslaving the masses, might free them. Relieved of the necessity of wiring parts together, engineers found that as they crammed more and more components onto a single chip they garnered huge economies of scale. With cheap chips and the motto "One person -- one computer," Steve Jobs and Steve Wozniak founded Apple Computer, their goal nothing less than transforming the world.

And when the computer revolution came, not a single shot was fired. The microchip, it turned out, had fostered a people's revolution: It wasn't the machines that remade the world but the average Janes and Joes who used them. Computers never have become the household nerve centers envisioned by the utopian engineers. But they have worked their way into automobiles, televisions, stereos, microwaves and nearly every corner of business and scientific life. A second generation of Americans is now growing up at ease with the technology, familiar and facile with its wonders. And although much more than the computing power of the terrifying room-size electronic brains of the '50s now can fit on a person's lap, human beings are still very much in control. While modern supercomputers are finally starting to play a decent game of chess, they are still a long way from matching the everyday mental abilities of a 2-year-old child.

LEXIS® NEXIS® LEXIS® NEXIS®

Services of Mead Data Central

(c) 1990 U.S.News & World Report, June 18, 1990

The advent of the microchip has precipitated a fundamental change not only of ends but of means because it opens wide the conduits for the flow of information. Smart machines put awesome resources at the fingertips of ordinary folks. With computers, ideas move at the speed of light, stepping up the gears of society and allowing people to transform institutions faster than ever before. Thus, while America's longtime reluctance to share computer technology with the Soviet Union no doubt blunted the sophistication of Soviet missiles and hobbled the Soviet economy, it also made it easier for Soviet leaders to keep the masses under totalitarian control. One wonders whether Mikhail Gorbachev was weighing the microchip's two faces as he gawked at Apple's latest creation at a postsummit stopover in San Francisco. After all, computers are more than a way to improve economic efficiency; they are also the weapons of ordinary revolutions.

GRAPHIC: Picture, Revolutionary. Robert Noyce, STEVEN PUMPHREY; Picture, Microchip magic. Smart machines put awesome resources at the fingertips of ordinary folks. Ideas move at the speed of light, stepping up the pace of social transformation, DAVID PARKER -- PHOTO RESEARCHERS

LEXIS® NEXIS® LEXIS® NEXIS®

PATENT & TRADEMARK OFFICE

FAX COVER SHEET

Date: FEB. 28, 19

To: Company/Agency WHITE HOUSE

Attention FRED SAINZ

Location

Fax Number 202 - 456 - 6218

From: Sender GIL WEIDENFELD

Office Number 703 - 557 - 3341

Number of pages (including cover page) 5

Patent and Trademark Office
Washington, D.C. 20231
Fax Number (703) 557-8240

REMARKS:

The Story of the U.S. Patent and Trademark Office

U.S. DEPARTMENT OF COMMERCE
C. William Verity, Secretary

Patent and Trademark Office
Donald J. Quigg, Assistant Secretary of Commerce
and Commissioner of Patents and Trademarks

August 1988

The issue of patents for new discoveries has given a spring to invention beyond my conception.

THOMAS JEFFERSON

The Patent System added the fuel of interest to the fire of genius.

ABRAHAM LINCOLN

For 23 years, until the creation of the Department of Agriculture in 1862, the Patent Office continues this work. The annual reports of the Patent Commissioners during these years devote considerable space to agricultural topics. For many years part of the Patent Office Fund is used for distributing free seeds to farmers.

The Act of March 3 provides that appeals from the Patent Commissioner may be taken to the Chief Justice of the U.S. Court for the District of Columbia.

The Act permits an American inventor to use publicly or sell his article for 2 years before applying for a patent, without forfeiting his right to a patent.

Two assistant examiners are added to the Patent Office staff.

1840 The Patent Office moves into its new home at F and Eighth Streets NW. The building to which wings are added in 1852, 1856, and 1867, becomes the home of the Patent Office for the next 92 years.

June 20.—Samuel F. B. Morse, of New York, receives Patent No. 1,647 for "Telegraph Signs." This is the telegraph, which, by making possible instantaneous communication between far corners of the land, plays an important role in bringing the peoples of the world more closely together.

1842 **ACT OF AUGUST 29**

Designs Are Made Patentable

"Any person, who by his own industry, genius, efforts and expense, has invented any new and original design" becomes entitled to a design patent. The term of a design patent is 7 years. (By 1965 over 200,000 design patents had been issued.)

The Act of August 29 requires the owner of a patent to mark his article as patented, including the date on which the patent was issued. Any failure to do so results in a $100 fine—one half to go to the informer.

A similar penalty is provided for falsely marking any article as patented.

The Act includes a few additional provisions.

November 9.—George Bruce of New York, N.Y. receives Design Patent No. 1, for Printing Types.

1844 The first Commissioner of Patents, Henry L. Ellsworth, states in his annual report for 1843, while commenting on important inventions which have been made, that "the advancement of the arts, from year to year, taxes our credulity and seems to presage the arrival of that period when human improvement must end." This rhetorical flourish is probably the origin of the unfounded story of the Patent Office official who resigned because everything had been invented.

June 15.—Charles Goodyear of New York receives Patent No. 3,633 for an "Improvement in the Manner of Preparing Fabrics of Caoutchouc or India-Rubber."

The vulcanization of rubber, which Goodyear's process made possible, gives rise to great industries in the years to come.

1845 *Edmund Burke, second Commisioner of Patents, May 7, 1845, to May 10, 1849.*

The Republic of Texas joins the Union. The following year Commissioner Burke urges that steps be taken to validate the patents issued by Texas, but no action appears to have been taken.

The Patent Office technical staff consists of the Commissioner, two examiners, and two assistant examiners. During the year, 1,246 applications are filed.

1846 *September 10.*—Elias Howe, Jr., of Cambridge, Mass., receives Patent No. 4,750 for an "Improvement in Sewing Machines." By inventing a "new and useful machine for sewing seams in cloth or other articles," Howe gives a new stimulus to industry.

1848 ACT OF MAY 27

Congress places in the hands of the Commissioner of Patents the power of extending patents. Since 1836 this power had been vested in a Board consisting of the Secretary of State, the Commissioner of Patents, and the Solicitor of the Treasury.

Two principal and two assistant examiners are added to the Patent Office staff.

A few other changes are made.

1849 ACT OF MARCH 3

The Act of March 3 transfers the Patent Office from the State Department to the newly created Department of the Interior. Not until April 1926 does the Patent Office come under the jurisdiction of the Department of Commerce.

Thomas Ewbank, third Commissioner of Patents, May 10, 1849 to November 8, 1852.

May 22.—Abraham Lincoln, Congressman from Illinois, receives Patent No. 6,469 for "A Device for Buoying Vessels over Shoals."

The invention consists of a set of bellows attached to the hull of a ship just below the water line. On reaching a shallow place the bellows are filled with air, and the vessel, thus buoyed, is expected to float clear. Lincoln whittled the model for his application with his own hands. It can be seen at the National Museum of American History (Smithsonian Institution) in Washington.

When a young man, Lincoln took a boatload of merchandise down the Mississippi River from New Salem to New Orleans. At one point the boat slid onto a dam, and was set free only after heroic efforts. In later years, while crossing the Great Lakes, Lincoln's ship ran afoul of a sandbar. The two similar experiences led him to conceive his invention.

Lincoln's appreciation of inventions was later to be of great service to the Nation. John Ericcson's *Monitor*, the ironclad which defeated the *Merrimac*, would never have been built except for Lincoln's insistence, nor would the Spencer repeating rifle have been adopted by the Army.

THE LIBRARY OF CONGRESS

Date: 2-20-90

FACSIMILE COVER PAGE

TO

Name: Stephanie Blessey

Location: White House

Telephone Number: ( ) 456-7750 **FAX Equipment Number:** ( ) 456-6218

FROM

Name: Sheridan Harvey

Location: Library of Congress

Telephone Number: ( ) 707-2273 **FAX Equipment Number:** ( )

****

IF THERE ARE PROBLEMS IN TRANSMISSION:

Please Call: **Telephone Number:** ( )

Messages (if any): from The Great Quotations, comp. George Seldes NY: Lyle Stuart, 1960, pp. 224-7

1 of 3 pages

LW 3/88 (rev 4/89)

strength for the sacrifices necessary to ensure the future of mankind.

Message to Canadian Education Week, March, 1952.

To my mind, to kill in war is not a whit better than to commit ordinary murder.

Kaizo, Tokyo, 1952.

It gives me great pleasure indeed to see the stubbornness of an incorrigible non-conformist warmly acclaimed.

On receiving the Lord & Taylor Award, 1953.

Any power must be an enemy of mankind which enslaves the individual by terror or force, whether it arises under a fascist or communist flag. All that is valuable in human society depends upon the opportunity for development accorded the individual.

Statement, London, September 15, 1933.

I am convinced that some political and social activities and practices of the Catholic organizations are detrimental and even dangerous for the community as a whole, here and everywhere. I mention here only the fight against birth control at a time when overpopulation in various countries has become a serious threat to the health of people and a grave obstacle to any attempt to organize peace on this planet.

Letter to a reader of the Brooklyn Tablet, who questioned Dr. Einstein if he had been correctly quoted, 1954.

By academic freedom I understand the right to search for truth and to publish and teach what one holds to be true. This right implies also a duty: one must not conceal any part of what one has recognized to be true. It is evident that any restriction of academic freedom acts in such a way as to hamper the dissemination of knowledge among the people and thereby impedes national judgment and action.

Letter on 75th birthday, March 13, 1954.

In principle, everybody is equally involved in defending the constitutional rights. The "intellectuals" in the widest sense of the word are, however, in a special position since they have, thanks to their special training, a particularly strong influence on the formation of public opinion. This is the reason why those who are about to lead us toward an authoritarian government are particularly concerned with intimidating and muzzling that group.

It is therefore in the present situation especially important for the intellectuals to do their duty. I see this duty in refusing to cooperate in any undertaking that violates the constitutional rights of the individual. This holds in particular for all inquisitions that are concerned with the private life and the political affiliations of the citizens. Whoever cooperates in such a case becomes an accessory to acts of violation or invalidation of the Constitution. *Ibid.*

The existence and validity of human rights are not written in the stars . . . Those ideals and convictions which resulted from historical experience, from the craving for beauty and harmony, have been readily accepted in theory by man—and at all times, have been trampled upon by the same people under the pressures of their animal instincts. A large part of history is therefore replete with the struggle for those human rights, an eternal struggle in which a final victory can never be won. But to tire in that struggle would mean the ruin of society.

In talking about human rights today, we are referring primarily to the following demands: protection of the individual against arbitrary infringement by other individuals

or by the government; the right to work and to adequate earnings from work; freedom of discussion and teaching; adequate participation of the individual in the formation of his government. *These* human rights are nowadays recognized theoretically, although, by abundant use of formalistic, legal maneuvers, they are being violated to a much greater extent than even a generation ago.

Address, Chicago Decalogue Society, February 20, 1954.

I would rather choose to be a plumber or a peddler in the hope to find that modest degree of independence still available under present circumstances.

Letter acknowledging plumbers' union card, November, 1954.

Never do anything against conscience even if the state demands it.

Saturday Review obituary, April 30, 1955.

I cannot imagine a God who rewards and punishes the objects of his creation, whose purposes are modeled after our own—a God, in short, who is but a reflection of human frailty. Neither can I believe that the individual survives the death of his body, although feeble souls harbor such thoughts through fear or ridiculous egotisms.

N. Y. Times Obituary, April 19, 1955.

My religion consists of a humble admiration of the illimitable superior spirit who reveals himself in the slight details we are able to perceive with our frail and feeble minds. That deeply emotional conviction of the presence of a superior reasoning power, which is revealed in the incomprehensible universe, forms my idea of God. *Ibid.*

What is the meaning of human life, or for that matter, of the life of any creature? To know an answer to this question means to be religious. You ask: Does it make any sense, then, to pose this question? I answer: The man who regards his own life and that of his fellow creatures as meaningless is not merely unhappy but hardly fit for life.

N. Y. Times Magazine, April 24, 1955.

The important thing is not to stop questioning. Curiosity has its own reason for existing. One cannot help but be in awe when he contemplates the mysteries of eternity, of life, of the marvelous structure of reality. It is enough if one tries merely to comprehend a little of this mystery every day. Never lose a holy curiosity.

Personal memoir of William Miller, an editor, Life, May 2, 1955.

Try not to become a man of success but rather try to become a man of value.

Ibid.

I do not believe in the God of theology who rewards good and punishes evil.

Ibid.

The presence of a superior reasoning power . . . revealed in the incomprehensible universe, forms my idea of God.

Ibid.

If we want to resist the powers which threaten to suppress intellectual and individual freedom we must keep clear before us what is at stake and what we owe to that freedom which our ancestors won for us after hard struggles.

Without such freedom there would have been no Shakespeare, Pasteur, or Faraday. There would be no comfortable houses for the mass of the people, no railways or wireless, no protection against epidemics, no cheap books, no culture, no enjoyment of art at all. There would be no machinery to relieve people from the arduous labor

needed for the production of the essential necessities of life. Most people would lead a dull life of slavery just as under the ancient despotisms of Asia. It is only men who are free who create the inventions and intellectual works which to us moderns make life worth while.

Address, Albert Hall, London, quoted, N. Y. Times.

Why does this magnificent applied science, which saves work and makes life easier, bring us so little happiness? The simple answer runs: Because we have not yet learned to make sensible use of it.

Address, California Institute of Technology.

If my theory of relativity is proven successful, Germany will claim me as a German and France will declare that I am a citizen of the world. Should my theory prove untrue, France will say that I am a German, and Germany will declare that I am a Jew. *Address at the Sorbonne.*

I cannot believe that God would choose to play dice with the world . . . *Raffiniert ist der Herr Gott, aber boshaft ist Er nicht.*

Letter to his colleague, Prof. Max Born.

The ideals which have lighted my way, and time after time have given me new courage to face life cheerfully, have been Kindness, Beauty, and Truth . . . The trite subjects of human efforts—possessions, outward success, luxury—have always seemed to me contemptible.

Forum & Century, vol. 84.

My political ideal is democracy. Let every man be respected as an individual and no man idolized. *Ibid.*

Force always attracts men of low morality, and I believe it to be an invariable rule that tyrants of genius are succeeded by scoundrels. *Ibid.*

That worst outcrop of herd life, the military system, which I abhor . . . This plague-spot of civilization ought to be abolished with all possible speed. Heroism on command, senseless violence, and all the loathsome nonsense that goes by the name of patriotism—how passionately I hate them! How vile and despicable seems war to me! I would rather be hacked in pieces than take part in such an abominable business. My opinion of the human race is high enough that I believe this bogey would have disappeared long ago, had the sound sense of the people not been systematically corrupted by commercial and political interests acting through the schools and the Press. *Ibid.*

The true value of a human being is determined primarily by the measure and the sense in which he has attained liberation from the Self.

Ideas and Opinions of Albert Einstein.

The development of mechanical methods of warfare is such that human life will become intolerable if people do not discover before long a way of preventing war . . . People seek to minimize the danger by limitation of armaments and restrictive rules for the conduct of war. But war is not a parlor game in which the players obediently stick to the rules. Where life and death are at stake, rules and obligations go by the board. Only the absolute repudiation of all war can be of any use here. *Ibid.*

Anybody who really wants to abolish war must resolutely declare himself in favor of his own country's resigning a portion of its sovereignty in favor of international institutions. *Ibid.*

We cannot despair of humanity, since we are ourselves human beings. *Ibid.*

If it (the hydrogen bomb) is successful, radioactive poisoning of the atmosphere and hence annihilation of any life on earth has been brought within the range of technical possibilities. *Ibid.*

Judaism is not a creed: the Jewish God is simply a negation of superstition, an imaginary result of its elimination. It is also an attempt to base the moral law on fear, a regrettable and discreditable attempt. Yet it seems to me that the strong moral tradition of the Jewish nation has to a large extent shaken itself free from this fear. It is clear also that "serving God" was equated with "serving the living." The best of the Jewish people, especially the Prophets and Jesus, contended tirelessly for this. *Ibid.*

No wealth in the world can help humanity forward, even in the hands of the most devoted worker in this cause . . . Can anyone imagine Moses, Jesus, or Gandhi armed with the money-bags of Carnegie? *Ibid.*

The attempt to combine wisdom and power has only rarely been successful and then only for a short while.

Aphorisms for Leo Baeck: Ibid.

Few people are capable of expressing with equanimity opinions which differ from the prejudices of their social environment. Most people are even incapable of forming such opinion. *Ibid.*

Whoever undertakes to set himself up as a judge in the field of Truth and Knowledge is shipwrecked by the laughter of the gods. *Ibid.*

I do not intend to argue with you about what inroads on human liberty may be justified by reasons of state. But the p scientific truth, detached from the interests of everyday life, ought treated as sacred by every governm it is in the highest interests of all th servants of truth should be left in

Letter of protest to Rocco, Mus Minister of Justice and Educatio

1. Those instrumental goods whic serve to maintain the life and hea human beings should be produce least possible labor of all.

2. The satisfaction of physical indeed the indispensable pre-condi satisfactory existence, but in itself enough. In order to be content, n also have the possibility of develo intellectual and artistic powers ever extent accords with their characteristics and abilities.

On Freedon

Peace cannot be kept by forc only be achieved by understandin

Notes on P

Perfection of means and con goals seem—in my opinion—to ch our age. *Out of My Later*

If we desire sincerely and pa the safety, the welfare and the velopment of the talents of all shall not be in want of the approach such a state. Even if on part of mankind strives for such g superiority will prove itself in the

Arrows of hate have been shot but they never hit me, because they belonged to another world, w I have no connection whatsoever.

Scientists can collaborate in the goal of international securit take a stand in the face of publi

CURT: The Science Budget figures

should be modified if one wishes to use different economic assumptions.

REFORMIST STEPS—TOWARD A NEW DOMESTIC ORDER

Whatever one's economic assumptions, America nonetheless can—and must—continue its historic mission: protecting freedom, accelerating innovation, assuring fairness, increasing growth and opportunity, while limiting the expansion of intrusive and inefficient government. The President's 1992 budget limits the growth of Federal spending to 2.6 percent—less than the inflation rate. Within this limit, it nonetheless helps advance the process of American renewal. The budget proposes reform measures in each of the following domestic areas:

(1) Education Reform

The United States spends more per student on education than almost every other country on earth. Yet, the average performance of American elementary and secondary school students on internationally administered tests is disgracefully low. The performance is below that of America's major trading partners. It falls consistently near the bottom. The current system unnecessarily holds young people back, holds workers back, and holds the Nation back. Clearly, more of the same cannot be acceptable.

In coordination with the Nation's Governors, the President has initiated an ambitious national reform effort. Consistent with that reform effort, the budget gives special emphasis to increased investment in child care (including almost $10 billion in tax credits and $732 million for the new child care block grant), Head Start ($2.1 billion), compensatory education ($6.4 billion), mathematics and science education ($1.9 billion), and the measurement of results.

To accelerate the more basic reforms that are necessary, the budget provides $690 million for a new Educational Excellence Act. And, perhaps most importantly, it encourages increased parental choice through: demonstration grants, greater flexibility for States, an information clearinghouse, and a new incentive fund for States and localities that adopt choice-oriented certificate programs. Greater choice would help foster a more market-like system and hold schools more accountable for performance. It is only with performance-based choice that more fundamental reform is likely to be achieved. (See Chapters IV.A. and V.A.)

(2) Research and Development

America's long-term position internationally and the potential for improvement in life at home depend fundamentally upon investment in a strong R&D base. Unfortunately, short-term claims and pressures often tend to drive out long-term investment. R&D is especially vulnerable in both the public and private sectors. Since the 1960s, investment in civilian R&D, particularly, has experienced a troublesome decline as a percent of GNP. To counter these tendencies, the President's budgets have sought to protect and increase R&D investment—without having the government cross the line into the problematic area of "industrial policy."

This budget proposes to make the R&D tax credit permanent in order to encourage more private R&D; while it also increases the direct Federal investment to $76 billion for 1992—up $8.4 billion to the highest level ever. Basic research would increase to $13 billion, with pathbreaking efforts that range from high-energy physics to what promises to be one of the most important and far-reaching research projects in human history: the Human Genome Project. In applied civilian R&D, exciting investments range from materials processing, to biotechnology, to high-speed rail transport and electric battery technology, to high performance computing. This investment in R&D unquestionably has the potential—in time—to bring radical improvement in the quality of human life across-the-board. (See Table II–2 and Chapter IV.C.)

(3) Financial Sector Reform

The S&L crisis was a central focus of reform last year. This year, public attention has begun to shift to the risks associated with banks. While the analogy with S&Ls is not appropriate, there unquestionably are risks. From a budgetary perspective, they are reflected in the baseline projection for the Bank Insurance Fund. In the absence of remedial

Table II–2. **ENHANCING RESEARCH AND DEVELOPMENT AND EXPANDING THE HUMAN FRONTIER—HIGHLIGHTS**
(Dollar amounts in millions)

	Budget Authority			
	1991 Enacted	1992 Proposed	Dollar change	Percent change
Basic Research				
Doubling the NSF budget	2,316	2,722	+406	+18
Increasing Basic Biomedical Research at NIH	4,634	4,968	+334	+7
Human Genome Project	135	169	+35	+26
Agricultural Research Initiative	73	125	+52	+71
Superconducting Super Collider	243	534	+291	+120
Applied Research				
High Performance Computing and Communications	489	638	+149	+30
Energy R&D	676	903	+227	+34
Advanced Manufacturing and Materials	1,316	1,310	–6	—
HIV/AIDS	1,152	1,210	+58	+5
Moving Fusion Energy from Science to Engineering	275	337	+62	+23
Aeronautics R&D	482	543	+61	+13
Expanding R&D at the National Institute of Standards and Technology	215	248	+33	+15
Maintaining National Security: Defense R&D	37,783	43,247	+5,464	+14
Expanding the Geographic Frontier: Space Exploration				
Space Transportation Infrastructure	4,801	5,517	+716	+15
Space Science	1,774	2,141	+367	+21
Mission to Planet Earth (Global Change)	954	1,186	+232	+24
Mission From Planet Earth	2,199	2,470	+271	+12
Expanding the Human Frontier through Biotechnology	3,788	4,107	+319	+8

legislative action, the Fund balance would turn negative in 1992. (See Chapter VIII.A.)

But the issues involved are far broader than merely the accounting status of the Bank Insurance Fund. Financial markets have become global. So has competition in financial services. Technological advances have changed both the character of services and of service-providers. Yet, the legal and regulatory framework attempting to govern the American financial service sector has not adapted. It is outdated—as will be many American competitors if the framework is not modernized.

With this problem in clear view, the President is proposing a comprehensive reform of both deposit insurance and the legal-regulatory framework governing the financial services sector. (See associated Treasury study.)

(4) Incentives for Saving and Investment

In the past decade, significant tax bills have been enacted at the rate of almost one per year—including historic tax reform. On balance, the tax system has been radically improved. As a general matter, both the tax system and the taxpayer deserve a rest. Still, there is one area that continues to merit further reform: the need to strengthen incentives for saving and long-term investment.

Accordingly, the President's budget proposes incentives to encourage: family savings, homeownership, longer-term investment, and investment in Enterprize Zones. (See Chapter X and the related discussion of pay-as-you-go requirements in Chapter XIV.)

(5) "Entitlement" Reform

In looking at the changing composition of the Federal budget since the 1960s, two trends stand out:

- First, the budget is being taken over by so-called "mandatory" or "entitlement " programs. These are largely transfer payments, which are not now subject to annual appropriation. They have grown from 28 percent of the budget in President Ken-