Address by
Honorable Hubert H. Humphrey
Vice President of the United States
to
University of Minnesota
Duluth, Minnesota
June 10, 1966

"This will indeed be an age of scientific and technological miracles. But will it be an age fit for—or even safe for—human beings to live in? That depends largely upon what we make it."

As recently as 1930, even so towering a genius as Albert Einstein could say about the future: "I never think of it. It comes soon enough."

Today the future rushes toward us far too quickly for comfort. We can no longer "Seize the day!" as the poet Horace counseled, for today has become little more than a faint blur between yesterday and tomorrow.

It took mankind 200,000 years to emerge from the Stone Age. It took another 10,000 years from the first use of metal tools to the Industrial Revolution, now hardly a century old.

Two key exhibits in our Smithsonian Institution vividly illustrate the dramatic acceleration in the tempo of progress. One is the first commercial computer, only 17 years old. The other is astronaut John Glenn's space capsule, only four years old, but already a museum piece.

It is no wonder that the future has ceased to be the domain of oracles and astrologers, and become a serious preoccupation of scholars, government officials, and businessmen. For, to the extent that we can foresee the future, we may be able to achieve some control over it.

Trends Which Shape The Future

The explosion of scientific knowledge is the major cause for our increased and highly practical interest in the future. But there are others as well.

First, there is the commitment to economic growth which is now accepted and, indeed, embodied in governmental institutions by every modern nation. This inevitably gives rise to the question: "Growth for what?"

Second, there is the rise of a new generation and the emergence of many new nations. These developments have created many new demands upon human society—and science and technology have inspired a new and insistent optimism about their fulfillment.

Third, there is the development of a new intellectual technology—games theory, decision theory, cybernetics, systems analysis—all of which, tooled by the computer, have allowed us to construct models of the future and assess their implications.

Looking Into Tomorrow

This new interest in the future has taken a variety of forms. The French Government, for example, has established an official "1985 Committee" to explore different choices in the use of expected increases in the French national income. The American Academy of Arts and Sciences is looking even further ahead. It is creating a Commission on the Year 2000 to anticipate social problems and to design new institutions to cope with them. At least half a dozen non-governmental organizations are seeking to forecast some aspect or another of the future, and something like two dozen serious books have been published on this theme.

Developments Up Ahead

One of the most interesting glimpses into the future was that undertaken recently by a representative panel of modern-day oracles—engineers, physical scientists, mathematicians, economists, and social scientists. Here are some of the developments they foresee within the next 20 years:

- In agriculture, the large-scale use of de-salinated sea water, making many of today's deserts blossom.
- In medicine, the routine transplantation of natural organs from one person to another and the use of artificial ones.
- In psychiatry, the widespread application of drugs that control or modify the personality.
- In education, the use of more sophisticated teaching machines and really radical teaching techniques.
- In worldwide communication, the everyday employment of translating machines.
- In industry, the extensive use of automation, up to and including some kinds of decision-making at the management level.
- In space, the establishment of a permanent manned base upon the moon.

Some of you might say that there is nothing very surprising here. And you would be right. Experience shows that it takes 10 to 30 years for a new idea to make its way from its inception in a scientist's mind to its general application in everyday life. Therefore, the world of 20 years from now already exists, in embryo, in the test-tube, in the laboratory, in the prototype.

For the year 2000 however, the experts foresee some really far-out developments:

- The virtual elimination of bacterial and viral diseases.
- The correction of hereditary defects through the modification of genetic chemistry.
- The stepping-up of our food supply through large-scale ocean-farming and the fabrication of synthetic proteins.
- Control of the weather, at least on a regional scale.
- In space, the landing of men on Mars and the establishment of a permanent unmanned research station on that planet.
- The creation, in the laboratory, of primitive forms of artificial life.

This will indeed be an age of scientific and technological miracles. But will it be an age fit for—or even safe for—human beings to live in? That depends largely upon what we make it.

Limited Research In Social Sciences

Presently, the amount of talent, effort, and money we are putting into science and technology far exceeds what we are devoting to the means of mastering them and directing them to human ends. Here in America we spent 20 billion dollars on research and development last year, but only about 500 million of this went to research in the social sciences.

I think this disproportion is not entirely unrelated to a rather disturbing consensus of the same panel of experts which looked ahead to the future of science and technology. While they foresaw staggering advances in the field of weaponry, they did not regard as probable any strengthening in our international institutions during the same period—that is, up to the year 2000.

The poet Alexander Pope declared that: "The proper study of mankind is man." I do not suggest that it should be the only study, or that we should reduce our expenditures on science and technology. I do suggest, however, that we need to step up very substantially the financial support, and even more the public esteem and attention, we devote to the

social sciences and the humanities, if we are to create human institutions to keep pace with our material advances.

The novelist George Orwell sounded a grim warning of the consequences of neglecting the human factor in his novel *1984*. He portrayed a world in which people would be reduced to mere robots, manipulated by an all-powerful, all-seeing "Big Brother." But fortunately human nature has proved tougher and more resilient than Orwell imagined and for that we may be truly thankful.

Responsible Government

Here in America some prophets of gloom and doom like to picture us in the future as faceless, voiceless subjects of "big government." I believe, as Mark Twain said of premature reports of his death, that these fears are grossly exaggerated.

Our American government will continue to fulfill its primary responsibilities and notably those of assuring every individual American, regardless of his race, creed, or color, equal rights and equal opportunity. But I believe that those responsibilities can be fulfilled without loss of individual freedom or initiative. Indeed, people whose rights are assured to them become not less free but more free.

Whether we become lost in an orgy of materialism, or use our material advances as means to greater individual expression, will depend on the wisdom of our national leadership—and the wisdom, therefore of the American people who choose that leadership. Given my present occupation, I must say I feel a certain optimism on both counts.

Excellence In Education

I do believe that the American people—and in particular, this generation of young men and women—have today reached a remarkable degree of national common sense and maturity. Not the least proof of this is the priority they attach today to excellence in education, such as you have received. It represents a real investment in the future of our nation—new wealth, new power, and new hope.

The adaptability to make continuing adjustments—in our world of dazzling change—will be required, of course, in the conduct of our national economy and in the lives and careers of individual Americans. But they are the kind of adjustments we are learning how to make, and we've been making them well.

We are learning, for instance, how to use 20th Century tools and theory in our economic affairs so as to maintain vigorous and sustained growth, and we are making steady progress in mopping up the pools of unemployment that remain.

We are learning to use the leisure and free time that labor-saving devices have made possible. Not only are we witnessing a tremendous boom in boats and bikinis, we are witnessing a boom as well in the arts—music, the theatre, painting, sculpture, the dance. We are witnessing a boom in libraries and book sales.

The Volunteer Generation

And I detect a particularly encouraging sign in your generation: a great increase in volunteer activity. This is indeed the volunteer generation. Thousands of young men and women are volunteering for work in our slums, in schools, serving less-privileged children, in VISTA, and in a host of private agencies. Thousands have entered the Peace Corps to help people in other areas of the world. Thousands have volunteered for the armed services. Thousands more are in the civil rights movement, seeking to right ancient wrongs.

One place where this volunteer impulse will be—and should be—expressed with increasing vigor is in our political life. Ever since Adlai Stevenson emerged on the national scene, a growing number of people have decided that politics is much too important to be left to professional politicians, and have jumped in with both feet. We see more and more young people at work at every level—all the way from stuffing envelopes and ringing doorbells to making their weight felt on the great issues of national and international affairs. This is a thoroughly involved and committed generation.

Avoiding Nuclear Catastrophe

In short, I think we're on the right track to a better future unless some inconceivable human error threatens to plunge us into nuclear cataclysm. I think most of you know the warning of the great English writer, H. G. Wells, that history in the future will be "a race between education and catastrophe." But few people remember how clearly, over

fifty years ago, he foresaw the actual shape of the catastrophe which now overhangs mankind. In his book, *The World Set Free*, he wrote:

"Nothing could have been more obvious . . . than the rapidity with which war was becoming impossible. . . . (But people) did not see it. They did not see it until the atomic bombs burst in their fumbling hands."

He was hopeful of humanity, nevertheless, for he also prophesied:

"The catastrophe of the atomic bombs . . . shook (men) out of their old-established habits of thought, and out of the lightly held beliefs and prejudices that came down to them from the past."

Samuel Johnson once remarked that nothing concentrates a man's thoughts so much as the imminence of hanging. And nothing has jolted people all over the world into hard, fresh, and concentrated thought as the prospect of thermonuclear annihilation. There is no longer any viable alternative to peace. Even the Soviet leaders acknowledged it when they said that communism itself could not survive an atomic holocaust. For the sake of all humanity, I hope that the leaders of Communist China will learn this same lesson in time.

Once all of us accept the plain fact that war has become much too dangerous to use as an instrument of national policy—even so-called "wars of national liberation" which the Communists still support and promote—we must draw the logical conclusions. We must think and research and work much harder to devise peaceful ways of ordering our affairs here on earth—an earth which science and technology have made virtually one great neighborhood.

The establishment of a world of freedom and justice under law—this is the great challenge, this is the great task of your generation.

Peace will not come merely because you ask for it, parade for it, or even demonstrate for it. It will come through hard work and sacrifice, through building stone upon stone, day after day and year after year.

Science for Peace

Finally, I say to this graduating class that we must deliberately direct the miraculous achievements of science and technology to the fulfillment of human needs. Only thus will man prove himself worthy of the incalculable powers for good and evil which science has placed in his hands. Science *can* destroy us—but it can also save us. The awesome force of atomic energy can mean catastrophe—or it can be a mighty force for peace and well-being. There is nothing inherently threatening in man's scientific discoveries. What counts is man's spirit—and the depth of his commitment to peace on earth.

REMARKS

VICE PRESIDENT HUBERT HUMPHREY

UNIVERSITY OF MINNESOTA

DULUTH, MINNESOTA

JUNE 10, 1966

A wonderful Day in St. Louis County

As recently as 1930, even so towering a genius as Albert Einstein could say about the future:

"I never think of it. It comes soon enough."

Today the future moves far too quickly upon us.

We can no longer "Seize the day!" as the poet Horace counseled, for today has become little more than a faint blur between yesterday and tomorrow.

It took mankind 200,000 years to emerge from the Stone Age.

It took another 10,000 years from the first use of metal tools to the Industrial Revolution, now hardly a century old.

Two key exhibits in our Smithsonian Institution vividly illustrate the dramatic acceleration in the tempo of progress. One is the first commercial computer, only 17 years old. The other is astronaut John Glenn's space capsule, only four years old, but already a museum piece.

It is no wonder that the future has ceased to be the domain of oracles and astrologers, and become a serious preoccupation of scholars and government officials. For, to the extent that we can foresee the future, we can achieve some control over it.

The explosion of scientific knowledge is the major cause for our increased and highly practical interest in the future. But there are others as well.

First, there is the commitment to economic growth which is now accepted -- and, indeed, embodied in governmental institutions -- by every modern nation. This inevitably gives rise to the question: "Growth for what?"

Second, there is the rise of a new generation and the emergence of many new nations. These developments have created many new demands upon human society -- and science and technology have inspired a new and insistent optimism about their fulfilment.

Third, there is the development of a new intellectual technology -- games theory, decision theory, cybernetics, systems analysis -- all of which tooled by the computer, have allowed us to construct models of the future and assess their implications.

This new interest in the future has taken a variety of forms.

not tea leaves, Palm Reading
astrology or oracle of Delphi

The French Government, for example, has established an official "1985 Committee" to explore different choices in the use of expected increases in the French national income.

The American Academy of Arts and Sciences is looking even further head, It is creating a Commission on the Year 2000 to anticipate social problems and to design new institutions to cope with them.

At least half a dozen non-governmental organizations are seeking to forecast some aspect or another of the future, and something like two dozen serious books have been published on this theme.

One of the most interesting glimpses into the future was that undertaken recently by a representative panel of modern-day oracles -- engineers, physical scientists, mathematicians, economists, and social scientists.

Here are some of the developments they foresee within the next 20 years.

· In agriculture, the large-scale use of de-salinated sea water. — impact on food + Population

· In medicine, the transplantation of natural organs and the use of artificial ones. —

· In psychiatry, the widespread application of drugs that control or modify the personality.

· In education, the use of more sophisticated teaching machines and teaching techniques

· In worldwide communication, the everyday employment of translating machines. and Intercontinental T.V.

· In industry, the extensive use of automation, up to and including some kinds of decision-making at the management level.

· In space, the establishment of a permanent base upon the moon.

Some of you might say that there is nothing very surprising here. And you would be right.

Experience shows that it takes 10 to 30 years for a new idea to make its way from its inception in a scientist's mind to its general application in everyday life. Therefore, the world of 20 years from now already exists, in embryo, in today's advanced research establishments.

For the year 2000 however, the experts foresee some really far-out developments.

- The virtual elimination of bacterial and viral diseases.
- The correction of hereditary defects through the modification of genetic chemistry.
- The stepping-up of our food supply through large-scale ocean-farming and the fabrication of synthetic proteins.
- Control of the weather, at least on a regional scale.

In space, the landing of men on Mars and the establishment of a permanent unmanned research station on that planet.

The creation, in the laboratory, of primitive forms of artificial life.

This will indeed be an age of scientific and technological miracles.

But will it be an age fit for -- or even safe for -- human beings to live in?

That depends largely upon what we make it.

Presently, the amount of talent, effort, and money we are putting into science and technology far exceeds what we are devoting to the means of mastering them and directing them to human ends.

Here in America we spent 20 billion dollars on research and development last year, but less than 550 million of this went to research in the social sciences.

I think this disproportion is not entirely unrelated to a rather disturbing consensus of the same panel of experts which looked ahead to the future of science and technology. While they foresaw staggering advances in the field of weaponry, they did not regard as probable any strengthening in our international institutions during the same period -- that is, up to the year 2000.

The poet Alexander Pope declared that: "The proper study of mankind is man."

I do not suggest that it should be the only study, or that we should reduce our expenditures on science and technology.

I do suggest, however, that we need to step up very substantially the financial support, and even more the public esteem and attention, we devote to the social sciences and the humanities, if we are to create human institutions to keep pace with material advance.

The novelist George Orwell sounded a grim warning of the consequences of neglecting the human factor in his novel 1984. He portrayed a world in which people were reduced to mere robots, manipulated by an all-powerful, all-seeing "Big Brother."

But fortunately human nature has proved tougher and more resilient than Orwell imagined, and for that we may be truly thankful.

Here in America some prophets of gloom and doom like to picture us in the future as faceless, voiceless subjects of "big government."

I believe, as Mark Twain said of a premature report of his death, that these fears are grossly exaggerated.

To be sure, Our American government will continue to fulfill its primary responsibilities -- and notably those of assuring every individual American, regardless of his race, creed, or color, equal rights and equal opportunity.

But I believe that those responsibilities can be fulfilled without loss of individual freedom or initiative. In fact, they should expand freedom.

Whether we become lost in an orgy of materialism, or use the material as a means to greater individual national expression, will depend on the wisdom of our leadership -- and the wisdom, therefore of the American people who choose that leadership.

Given my present occupation, I must say I feel a certain optimism on both counts.

More seriously, I do believe that the American people -- and in particular, your young generation -- have today reached a remarkable degree of national common sense and maturity.

Not the least proof of this is the priority they attach today to excellence in education, such as you have received.

The adaptability to make continuing adjustments -- in our world of dazzling change -- will be required, of course, in the conduct of our national economy and in the lives and careers of individual Americans. But they are the kind of adjustments we are learning how to make.

We are learning, for instance, how to use 20th Century tools and theory in our economic affairs so as to maintain vigorous and sustained growth, and we are making steady progress in mopping up the pools of unemployment that remain.

We are learning to use the leisure and free time that labor-saving devices have made possible.

Not only are we witnessing a tremendous boom in boats and bikinis, we are witnessing a boom as well in the arts -- music, the theatre, painting, sculpture, the dance. We are witnessing a boom in libraries and book sales. @ Tweed Gallery Here -

And I detect a particularly encouraging sign in your generation: An increase in volunteer activity. More people are working abroad in the Peace Corps, and in urban and rural slums right here in America through VISTA and private agencies, and in the civil rights movement, than George Orwell could have dreamed.

One place where this volunteer impulse will be -- and should be -- expressed with increasing vigor is in our political life.

Ever since Adlai Stevenson, a growing number of people have decided that politics is much too important to be left to professional politicians, and have jumped in with both feet. We see more and more of you at work at every level -- all the way from stuffing envelopes and ringing doorbells to making your weight felt on the great issues of national and international affairs.

In short, I think we're on the right track, unless some inconceivable human error threatens to plunge us into nuclear cataclysm.

I think most of you know the warning of the great English writer, H.G.Wells, that history in the future will be "a race between education and catastrophe."

But few people remember how clearly, over fifty years ago, he foresaw the actual shape of the catastrophe which now overhangs mankind.

In his book, The World Set Free, he wrote:

"Nothing could have been more obvious . . . than the rapidity with which war was becoming impossible . . . (But people) did not see it. They did not see it until the atomic bombs burst in their fumbling hands."

He was hopeful of humanity, nevertheless, for he also prophesied:

"The catastrophe of the atomic bombs . . . shook (men) out of their old-established habits of thought, and out of the lightly held beliefs and prejudices that came down to them from the past."

Samuel Johnson once remarked that nothing concentrates a man's thoughts so much as the imminence of hanging. And nothing has jolted people all over the world into hard, fresh, and concentrated thought as the prospect of thermonuclear annihilation.

There is no longer any viable alternative to peace. Even the Soviet leaders acknowledged it when they said that communism itself could not survive an atomic holocaust. For the sake of all humanity, I hope that the leaders of Communist China will learn this same lesson in time.

Once all of us accept the plain fact that war has become much too dangerous to use as an instrument of national policy -- even so-called "wars of national liberation" -- we must draw the logical conclusions. We must think and research and work much harder to devise peaceful ways of ordering our affairs here on earth -- an earth which science and technology have made virtually one great neighborhood.

The establishment of a world of freedom and justice under law -- this is the great challenge, this is the great task of your generation. — Peace we build — Stone by Stone

Sacrifice by Sacrifice — waging war on want — U.N. AID, Collective Security

The ROTC program is the greatest source for military officers. The Air Force ROTC program produces 8 times the number of 2nd Lieutenants the Air Force Academy does.

It produced great aerospace leaders - General LeMay and General Schiever.

Power for Peace

ROTC trained officers - all services are doing a magnificent job in Vietnam. I know. I was there and observed it.

Did you know it was a young ROTC trained captain that thought up converting the old C-47's into "Puff the Magic Dragon" shooting 100 rounds per second out the side of the aircraft as it circles to pin down the enemy until assault troops can be brought in.

Military men today do much more than just fight. In Vietnam and, indeed, around the world, they are a real "people to people" force -- building schools -- teaching -- healing -- helping the poor and under-privileged -- showing these nations and their people how to obtain a better life and the democracy way.

One from UMD has given his all -- Lt. John Banks, Class of '63 -- killed in action - Vietnam. One is missing in action -- Lt. David Wheat - U.S. Navy.

Others have or are serving in Vietnam - pilots Lt. Robert Cummings, Captain Larry Goldberg, and Lt. Kirk Ransom and Navigator Lt. Gary Wieck. Others are flying with Strategic Air Command and Military Airlift Command on vital missions.

Only thus will man prove himself worthy of the incalculable powers for good and evil which science has placed in his hands. Only thus will he make himself its master rather than its servant.

# # # # #

[Transcript]

Commencement Address
by
Vice President Hubert H. Humphrey
at University of Minnesota, Duluth
June 10, 1966

Introduction by Provost R. W. Darland:

We consider it most fortunate that Vice President Humphrey is able to be with us tonight. You'll recall that he was scheduled to be our commencement speaker a year ago, but he asked to be excused when President Johnson decided his talents were needed more critically in San Francisco. We regretted the decision, but naturally we didn't contest it. I know at the present time there is a phone in this building with a direct line to the White House. But I can't imagine that President Johnson would dare call until after Mr. Humphrey completes his address. For a time it seemed as though everyone of importance in Washington was spending weekends in Texas. We don't know if Mr. Humphrey tired of barbecues or horseback riding, but we've been pleased to note that he's been spending much more time at his own H.H.H. Ranch at Waverly, Minnesota.

More seriously, we are honored to have Mr. Humphrey back on the U.M.D. campus. He has visited here many times and has witnessed the progress that has been achieved over the years. I publicly want to thank him for the continuing support and interest he has given to U.M.D. and the University of Minnesota. It is highly appropriate that tomorrow evening on the Minneapolis campus Vice President Humphrey will be presented the degree of Doctor of Laws in recognition of his great service to the University, the State, and the Nation. The confidence President Johnson has shown in Mr. Humphrey's high ability has been aptly illustrated in recent months in the many difficult assignments given him around the world. The record already clearly shows that this man from Minnesota will rank as one of the greatest Vice Presidents in our nation's history.

Ladies and gentlemen, the Honorable Hubert H. Humphrey, Vice President of the United States.

Vice President Humphrey's Speech:

Thank you, Dr. Darland. Thank you, my fellow Minnesotans and fellow Americans, Mr. Montague and Mr. Griggs, my dear and good friend, the Congressman of this district, John Blatnik, Colonel Owens, Reverend High, members of the faculty of the University of Minnesota, Duluth, this very distinguished graduating class of 1966, their parents, friends, and family. This has been a wonderful day for me to come home, to come up here into this wonderful area of Minnesota and St. Louis County, to participate in the dedication of a great economic enterprise in your neighboring city of Eveleth, a new taconite plant, but more importantly, to see the spirit of the people, to see the young people, to see the children, and to see this new sense of the fulfillment of life in the countenance of the thousands of people that I have been privileged to see today. I am ever grateful and I want to thank each and every one for making this a happy day for me.

It's been a special joy to be in the company of my friend, Congressman Blatnik, who needs no words of praise from me, because his record speaks his own praise. And it is particularly good to once again see one of the great benefactors of this University and one of the truly public spirited citizens of this state, a man of great integrity, of independence and generosity, none other than your own Mr. Richard Griggs, who has done so much for this community. So my heart is tonight filled with gratitude and with sentiment.

But I come here to visit with the graduating class. Now generally we commencement speakers tell you we are out here to give you advice. And the nice part about it is that you don't have to take it. You do have to sit through it, but you do not have to accept it. The truth is that those in public life that go out and make commencement addresses are not out to give advice. They are out here under a special cover, so to speak, a cloak of a sort, to get advice, to put our ears to the ground, to listen to the rumblings, and then to run back to Washington and prepare ourselves for the Fall, particularly on election year. I have heard some wonderful rumblings since I've been home, and I would just like to stay around for a little while.

But I want to talk to you about what's happening in our State and our Nation, and I want to talk to this graduating class not as one that is worried about you, because you are going to have to worry about yourself. I had to. I want to share the same opportunity with you. And I am not going to come here and tell you that the whole world has gone to pot, because it hasn't. It's no more potty now than when I started in it. But I am going to tell you my honest views about the world in which we live, and what you might do about it if you wish, and then we'll just sort of lean back and see what you do, because, you know, twenty-five, thirty years from now one of you might be up here, even less than that, giving this commencement address. And I am going to take a good look at you tonight, because after all you are going to have an awful lot to say about what happens to me, both as to the security of our country and my Medicare. I just want to be sure what kind of stock is in charge around here.

Well you know as recently as 1930 even so towering a genius as Albert Einstein could say about the future these words: "I never think of it, it comes soon enough." Well, today the future moves so rapidly and so quickly upon us that it is like a blur. We no longer "seize the day!" as the poet Horace counseled, for today has become little more than a faint blur between yesterday and tomorrow. It whizzes by. It wasn't always so, though. It took mankind 200,000 years to emerge from the Stone Age. It took another 10,000 years from the first use of metal tools to the Industrial Revolution, which is now only a century old. But things have stepped up. It is less than sixty years ago that the first heavier-than-air craft--manned air craft--flew for twelve seconds at a phenomenal speed of fifty miles an hour for a hundred feet. I think it was, to be accurate, a hundred and ten feet. And yet, it was only within the last three months that two of our astronauts were in outer space in a Gemeni capsule for two weeks covering well over a million miles, flying at the speed of approximately 18,000 miles an hour, and returned safely to earth. In fact, Colonel Borman was in my office the day before yesterday with his family and told me it was a

beautiful experience. I asked him if he thought the trip was necessary, and he said yes. He had a wonderful experience.

Two key exhibits in our Smithsonian Institution vividly illustrate the dramatic acceleration that I am speaking to you, that of which I speak. One is the first commercial computer, only seventeen years old. The other is astronaut John Glenn's space capsule. The first, only four years old, but already a museum piece. And already since John Glenn, walking in space, docking in space, the Surveyor on the moon, five thousand pictures as of tonight taken of the moon, pass by of Venus, solar orbiting laboratory, and much more yet to come.

It's no wonder that the future has ceased to be the domain of oracles and astrologers, and has become the serious preoccupation of scholars and government officials and business men. For, to the extent that we're able to foresee the future, we might be able to achieve some control over it.

Now the explosion of scientific knowledge is the major cause for our increased and highly practical interest in the future. But there are others as well.

But this explosion of knowledge, which is manifested tonight by this graduating class tells us of the rapid changes that we're making, and it tells us that we are living in the most exciting age that man has ever known, and the most dangerous, the most promising, and yet it could be the most despairing. What is some of the change and the excitement?

Well first there is the commitment to economic growth, which is now accepted--and indeed embodied in governmental institutions--by every modern nation. Second, there is the rise of a new generation and the emergence of many, many new nations. These developments have created many new demands upon society--and science and technology have inspired a new and insistent optimism about their fulfillment. Really, we feel we can almost do anything today with science and technology. Third, there is the development of a new intellectual technology--games theory, decision theory, cybernetics, systems analysis--all of which tooled by the computer, have allowed us to construct models, yes, models of the future, and run the game, so to speak, about the future, and assess their implications.

Now that future has taken many new forms. The French government, for example, has established an official "1985 Committee" to examine the impact of increases in French national income. What will it mean to the Frenchmen?

The American Academy of Arts and Sciences is looking even further ahead. It has created a Commission on the Year 2000. These young people before us can look to the year 2000 as just another step in life's journey. And they want to take a look at the year 2000 to anticipate the social problems and to design new institutions to cope with them. Now one of the

most interesting glimpses into the future has been undertaken recently by a representative panel of modern day oracles, sort of palm readers, you know. Tea readers, but they are much more professional than that. They are engineers, physical scientists, mathematicians, economists, and social scientists. And here are some of the developments that this class can look forward to within the next twenty years. And after the next twenty years, to the year 2000.

The next twenty years in agriculture, large-scale use of de-salinated sea water. The deserts shall bloom as surely as these students are before us here tonight. Food will be in abundance. Man's technology will change sea water into sweet water. It is practically at that stage now.

In medicine, the transplantation of natural organs and the use of artificial ones, one organ from another person to yet another.

In psychiatry, the widespread application of drugs that control or modify personality.

In education, the use of much more sophisticated teaching machines and really radical teaching techniques.

In world communication, the everyday employment of translating machines that will translate simultaneously five languages instantly from the technical journals. A minimum of five languages; Chinese, Russian, German, French, Spanish, Italian, at once into English, by machine, not be man.

In industry, the extensive use of automation, up to and including decision making at the management level. In fact, computers are doing that now.

And in space, and I speak with some authority in this as Chairman of the Space Council of your government, we will, by the next twenty years, have established a permanent base for celestial travel, up on the moon, occupied by man.

Some of you might say that there's nothing very surprising here. You've read about it. Well I suppose so, because experience shows that it takes from 10 to 20 or 30 years for a new idea to make its way from its inception in a scientist's mind to the general application in everyday life. Therefore, the world of twenty years from now already exists--in embryo, in the test tube, in the laboratory, in the prototype.

Now what about the year 2000, because that gets a little further ahead? But it's only 34 years away, and the 21 year olds out here will be just the same age as the speaker in the year 2000. I hope you'll feel as good!

The year 2000 may really see some far out developments. For example, the virtual elimination of bacterial and viral diseases, the correction of hereditary defects through the modification of genetic chemistry, the stepping up of our food supply through large-scale ocean farming, farming

the seas, and the fabrication of synthetic proteins, which can change the whole stature of life in the world. A world that is protein hungry, children that are stunted in mind and body because of the lack of protein. In the next few years, that will all be changed. The control of the weather, at least on a regional basis--that should come much sooner.

In space, our plan is the landing of a man on Mars and the establishment of a permanent unmanned research station on that planet. Atomic energy will make it possible for us to speed the journey to Mars a hundred-fold the present rate of space travel. The creation in the laboratory of primitive forms of artificial life, this will indeed be the age of technological miracles.

But now I must ask a question. Will it be an age fit for--or even safe--for human beings? Because technology and science are not the answer to all human needs, I think the answer depends largely upon what we make it. Presently, the amount of talent, effort, and money that we're putting into science and technology far exceeds what we are devoting to the means of mastering them and directing them to human needs.

Here in America we spend about 20 billion dollars a year on research and development in science and technology. We spend slightly over one-half billion dollars in research in the social sciences--one-fortieth of what we spend on science and technology. I think this disproportion is not entirely unrelated to a rather disturbing consensus of this panel of experts that I spoke to you of, which looked ahead to the future of science and technology. While that panel foresaw staggering advances in the field of engines and machines and weaponry, they did not regard as probable any strengthening in our international institutions during the same period--that is, up to the year 2000. Man creating more power to destroy himself? Possibly, but not necessarily creating the institutions to discipline himself.

Now the poet Alexander Pope declared that, "The proper study of mankind is man." Somebody has said that instead of studying outer space we should be studying inner man. Maybe both. Now I don't suggest that we should have only one study, namely of mankind, or that we should reduce our expenditures in science and technology. I do suggest, however, that we need to step up very substantially the financial support, and even more, the public esteem and attention that we devote to the social sciences and the humanities that this great University excels in if we are to create human institutions that can keep pace with material advance.

The novelist George Orwell sounded a grim warning of the consequences of neglecting the human factor in his novel called "1984," and the students are very familiar with it. He portrayed a world in which people were reduced to mere robots, manipulated by an all-powerful, all-seeing "Big Brother." But fortunately, human nature has proved tougher and more resilient than Orwell imagined and for that we can be truly thankful.

Here in America some prophets of gloom and doom like to picture us in the future as faceless, voiceless subjects of big government. Oh, I've heard it a thousand times. I believe as Mark Twain said,

however, of a premature report of his death, that these fears are grossly exaggerated. To be sure our American government will continue to fulfill its primary responsibilities, education, for example. Notably, those of assuring every individual American regardless of his race, his creed, his color, his national origin, or his last name, equal rights, equal opportunity, first class citizenship. But I believe those responsibilities can be fulfilled without the loss of individual freedom or initiative. In fact, when people receive their rights and have them protected, they are freer, not less free. Now whether we become lost in an orgy of materialism, or use the material as a means to greater individual expression, I think will depend upon the wisdom of our people and our national leadership. Of course, given my present occupation, I must say I feel a certain optimism on both counts.

But more seriously, I do believe that the American people--in particular this younger generation--have today reached a remarkable degree of national common sense and maturity. And not the least proof of this is the priority that is given to excellence in education.

There is an education explosion in this country that bodes well for the future. Fantastic! A dedication to education that represents a real investment in the future of our nation--the new wealth, the new power, and the new hope. And then the adaptability of our people to make adjustments in our world of dazzling change--this will be required, of course, in the conduct of our national economy and in the lives and careers of every American. But these are the kinds of adjustments that we are learning to make and we've made them well.

We're learning, for instance, how to use Twentieth Century tools in our economy, to maintain vigorous economic growth. And we're making steady progress in mopping up the old stagnant pools of unemployment, one of them right here in Northeastern Minnesota, that tore at us for years, that was a burden to us, and that unemployment today in most areas in nonexistent.

We're learning also to use leisure and free time that the labor-saving devices have made possible. Not only are we witnessing a tremendous boom in boats and bikinis, but we're witnessing a boom as well in the arts--in music, the theatre, painting, sculpture, the dance. I just visited a few moments ago the magnificent Tweed Gallery here at the University of Minnesota, Duluth, one of the finest in the land. It was almost unthinkable twenty-five years ago. But here it is.

And I detect a particularly encouraging sign in this younger generation, an increase in volunteer activity. And may I say to the parents, that this generation can be called the Volunteer Generation. Thousands of our young people are volunteering for work in our slums, in our schools to help the less fortunate, in Project Vista, and a host of private agencies. Thousands have gone into the Peace Corps to help in other areas of the world. Thousands and thousands like these young R.O.T.C. men tonight have volunteered for the armed services. Thousands more in the civil rights movement, trying to right ancient wrongs. And one place where this volunteer impulse will be--and should be--expressed with increasing vigor is in our political life.

Ever since Adlai Stevenson, a growing number of people have decided that politics is much too important to be left to the professional politicians, and they've jumped in with both feet. We see more and more of the young people at work at every level, from stamping envelopes and ringing doorbells, to making your weight felt on the great issues of national and international affairs. This is a generation that is involved in American life.

In short, I think we're on the right track, unless some inconceivable error, human error, threatens to plunge us into a nuclear cataclysm. Now I think most of us know the warning of the great English writer, H. G. Wells that history in the future will be "a race between education and catastrophe." And H. G. Wells was a prophet. Fifty years ago, he foresaw the actual shape of the catastrophe which overhangs mankind. He said, "Nothing could have been more obvious than the rapidity with which war was becoming impossible. But the people did not see it. They did not see it until atomic bombs burst in their fumbling hands." He said that in 1915, and the first atomic explosion was 1945. But he was hopeful of humanity, for he also prophesied that, "the catastrophe of the atomic bomb shook men out of their old fashioned habits of thought and out of the lightly held beliefs and prejudices that came down to them from the past."

Samuel Johnson once remarked that, "Nothing concentrates a man's thoughts so much as the imminence of hanging." And nothing has jolted the people all over the world in the hard fresh concentrated thought as the prospect of thermonuclear annihilation. There is no alternative to peace. None in the nuclear age. Even the Soviet leaders acknowledged it, when they said that communism itself could not survive an atomic attack. For the sake of all humanity, I hope the leaders of Communist China will learn this same lesson in time.

Once all of us accept the plain fact that war has become too dangerous as an instrument of national policy--even the so-called "wars of national liberation" that the Communists use--we must draw the logical conclusions. We must think and research and work much harder to devise peaceful ways of ordering our affairs here on earth--an earth which science and technology have made virtually one great neighborhood.

The establishment, then, of world freedom and justice under law--this is the challenge for the coming years as it has been in the past--and this is the great task of this generation.

But may I say that peace does not come because you parade for it, demonstrate for it, work for it, or even ask for it. It comes through sacrifice. It comes through stone-by-stone building, building day-by-day, year-by-year, and generation-by-generation. Peace, like a mighty cathedral, requires the work of many, the plan of a master architect, and the commitment of generations. And peace requires those building stones that I've talked of tonight, of AID, and of the Peace Corps, and of a just society here at home. It also requires a relentless war upon human want--everywhere. It needs the United Nations, and during this

troublesome period of building for peace, it even needs men in uniform. Military men do much more than just fight. In Viet Nam--indeed around the world--they are a real people-to-people force, building schools, teaching, healing, helping the poor and the underprivileged, and showing these nations and their people how to obtain a better life and a democratic way.

So I salute tonight those to whom I will present certificates very shortly, those who will be commissioned as Second Lieutenants in the United States Air Force. I salute them as brave men, as good men, as builders of peace, and not destroyers, as people who seek to protect life and not to take it. And I commend to this graduating class that the greatest challenge of all is the building of the peace and the conversion of science to the fulfillment of human need. Only thus will man prove himself worthy of the incalculable powers for good and evil which science has placed in his hands. The same science that can destroy us, can save us. The same man that made the atomic bomb of destruction can convert that great force for peace and for good. There is nothing wrong with man's machines. What is needed--is man's soul, his heart, his spirit--as a commitment to peace on earth.

Transcribed by Office of Academic Dean
University of Minnesota, Duluth
July 1, 1966

Minnesota
Historical Society

www.mnhs.org