

ADDRESS BY

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NOTRE DAME'S PRESIDENT'S COMMITTEE DINNER

During the past years with this Committee, I have talked to you about Notre Dame specifically and directly. For example, as you may recall, last year I talked to you about the things that I think make a great university, and I said those things were a great student body carefully chosen, a great faculty also carefully chosen, and working with a great curriculum that takes account of a solid educational philosophy, and finally, of course, good facilities.

The year before, I told you something about the history and traditions of Notre Dame. How it started from a log cabin, and grew into a university that covers almost a square mile with its buildings and facilities. I told you something how the basic philosophy there, was not just to train the mind, but to train the whole man, to train character as well as intelligence, because the great needs of our world today, and needs always will be with us, are not just for people of intelligence, but people who join to intelligence the spirit of integrity, because the world, as I mentioned two years ago, has enough, has seen enough of people who are just bright and clever, but don't have the character to carry out the things that this world needs.

This year I thought I would take a different way around the question without leaving the whole idea of education, and I want to speak particularly tonight about two things which emerged from two experiences I have had since our last meeting. One of these points has to do with a trip I took this summer to all of the countries of South America, and this trip began in Europe, because we had a meeting there to begin with, and then I flew to Rio from Lisbon; then down to Montevideo and Uruguay; and to Buenos Aires and Argentina; and over to Santiago and Chile; Lipaz and Bolivia; Lima and Peru; Quito, Ecuador, Colombia; Bogota, Colombia; Caracas, Venezuela; and finally, Panama, and on this trip I went to every university in these countries, and talked to every Rector and many of the Deans....and I talked to the various Ministers of education and the Presidents of some of the countries. I also talked to many of our Alumni, and many of the secondary school people in these countries, and tried, in so short a time, as much as one could....tried to get a picture of what the educational field was like in South America.

First of all, I would like to say that South America is a kind of dream world. I am sure many of you have been there. I think, perhaps, we tend to neglect the whole southern part of this hemisphere, and we think often too much of Europe. I have been to Europe four times before I went to South America, but if I had my choice tomorrow to go to one or the other, I would go to South America. I think there is much to be learned there, because you find a country that stands in about the same relationship to progress that we stood back in the....towards the middle or the second part of the last century. You find a country of tremendous resources, and development of those resources, that has moved faster since the war than development of resources has moved in this country, or in Europe. You find a population that is fast outstripping the population of the northern part of this hemisphere, and you find a great variety of people with all of the many problems they face; people of different ethnical backgrounds. You find the Portuguese stock and the Spanish stock. You find many European groups in large denominations....Italians....and Germans....and French. You find great hordes of Indians. In some countries the majority of the people are Indians, and you find each country with something a little different than the country that you saw just before it. You find different resources and different spirits, but the thing

As you know, education in this country began....I am speaking here always of higher education....it began as being totally the effort of private individuals; in many cases, religious bodies, and all of the early universities in this country were private universities, and after many of the great universities, the still great universities were founded, towards the middle of the last century, with the passage of the Morale Act, the land grant colleges came into being, then other great state universities came into being. Now, no one planned it this way, but as it has turned out, just about half of the students in this country today, half of the students in colleges and universities, are in private colleges and universities, and the other half are in public colleges and universities, and yet with this strong balance of private and public education, we have achieved some very real values, and to see the effect of these values, you really have to go to a country like South America, or a hemisphere, or a continent like South America to see what would happen in another kind of system, and what I say of South America is also largely true of Europe.

In South America there are very few private universities, and I don't honestly know that I can say there are any good ones. Most of the large educational endeavors there are state universities, and most of these state universities there lack almost completely any sense of discipline. You hardly find in any country in all of South America a full time faculty member. Most of the people have regular jobs, and they teach on the side. Some universities, like the University of Panama, don't even open up until five o'clock in the afternoon. The thing that is a very striking difference from our university life here, is that the universities are largely run by the students, and the students are one of the most anarchic and undisciplined group of people that one would ever imagine or meet. For example, the students in Bolivia....the university students....stormed the Presidential palace because they were angry at something, dragged him and all of his counsel....save one man who got out the back door, dragged them out into the street. As a matter of fact, the President was thrown out of the second floor window of his palace, and then they were all hung from lamp posts up and down the main street. Nothing was done to these gentlemen, because they were students.

The students, for example, in another large country in South America, decided that they were having too much Chemistry, so they decided that one of the Chemistry courses had to go. What would it be....quantitated or qualitative analysis. The students decided this question, because it happened that the Communist professor was teaching quantitative analysis, so he was kept on, and the gentleman who was teaching qualitative analysis didn't happen to be a Communist....he was of a different political timbre, so he was thrown out of the university, and the Communist professor was kept. This was decided by the university students themselves.

For example, in one country, where the people are 70% illiterate, there was not one child in school in the capital city....not one young man or one young woman....during the days that I was visiting this place, and the reason that none of them were in school was that the university students were on strike against the Government, and the secondary students went on strike in sympathy with the university students, and the primary students, down to the kindergarten, then went on strike in sympathy with the secondary students, and the result was that you had a country that was 70% illiterate, and not one person in school.

One professor that had come to one of the universities from Stamford, a very fine professor in Science, had come to teach in one of these universities, because they were very weak in the Chemistry Department. He had been

some fine universities in Argentina and Uruguay....and Chile....and some good universities in Brazil, and there are universities that are trying to be good in some of the northern countries of South America, but the fact that I am trying to get across is mainly that it's difficult to stand up, as I am standing here tonight, and talk about a university problem in many of these countries and South America, and the precise reason that is difficult is that there is no, or is hardly no university problem, as such, in South America, because all educational problems are totally involved and complicated with political issues. The party in power, the party that wants to get in power, the Communist party, or someone else. This makes a very difficult question.

I would submit to you gentlemen that there are a few problems more difficult in our country, or any country in the world today, than educational problems. To know what to do, and how to do it best, and yet in these countries, the political life is so involved in the university life....the students are so much a part of all these political issues in a revolutionary way; the Communist party has such a grasp on many of these student groups, and represents most of their leadership, that education becomes strictly a political issue, and I think when you see this happening in a country, and you see how it tears down the educational process....when you see the students running the school rather than the educators, and when you see the complete riot that goes on in many of these countries in the educational process, then you begin to see what has happened in this country, and you begin to appreciate the dual system that we have. A system where I would be willing to stand here and say that there is very little political interference in the great state universities of this country, and I think the reason that there is very little political interference, while most of our state universities have a reasonable amount of autonomy and independence as educational institutions, the reason is, that we, of the private universities, stand alongside of them, and if someone goes to President Hugday of Purdue, or President Wells in Indiana, and starts to tell him how he should run an educational institution, because the gentleman happens to be in the legislature, President Wells and President Hugday can say, look at President Resburgh up at Notre Dame....he is running his own institution the way he thinks best, and he is doing this because it's an educational process in which he is qualified, or should be qualified, seeing the job he has, and since he is free and autonomous in this process, I, too, although I belong to a state university, running on state funds, I, too, should have reasonable autonomy if you have an confidence in me as a President, and I told these gentlemen in many of these countries of South America, where, by law, it's not allowed to have an independent private university, I told them that the best way out of their trouble was to try somehow to have what we have....to try to bring into focus, and to bring into being, some strong private universities, because this will be the guarantee of political independence on the part of the state universities, which now have no independence and very little autonomy, and which are ridden through with politics, and every political issue.

When I got back home and began to think about this problem, the problem of education in South America, the problem of how they had grown up with the state completely controlling education, and the terrible mess it has had in many countries, I began to think about the blessings, if you will, of our own system that may be charged to happenstance, but the fact is that we do have 50% of our students in each one of our systems, and that our state universities are fairly free from any political interference. Then I began to think of the future, and what we might get into in this country if the present balance between public and private schools should be disturbed, and I would submit to you gentlemen tonight that this balance is very likely to be disturbed in the next twenty years ahead of us. As you know, from every

birth rate in this country on the lower levels, and if we take the increased proportion of young men and women going to college, it means that we will have to do in private education, in the next twenty years, twice or three times the work we have done since the time we have begun to exist in this country, and I think this is a job that is almost next to impossible.

I think it is almost next to impossible, for example, to take a school like Notre Dame, which right now, in its total physical assets has cost some sixty-two million dollars, or, would cost to replace it, and to say that in the next ten or twenty years we are going to double and triple those assets. I don't say it is absolutely impossible, but I say that if we begin to do that we won't do much of anything else educationally. We will be spending all our time looking for brick and mortar money, and looking for new professors to staff this school. But, the thing that bothers me is not just Notre Dame's problem, but the problem on the whole as a national problem, which all of us should be interested in, because we are coming up against such pressures in the years that come, that we can very easily disturb this balance, and this balance is indeed being disturbed in many of our states today.

For example, in the state of Michigan adjoining our school, the balance today is not 80-50, but about 30-64....64% of the students being in state schools, and the rest in private schools. We have managed to keep the balance fairly well in the state of Indiana, but again, you can't claim too much help from our part on that, because most of our students are from out of state. In many states, the balance has gone down as much as 70-30.... 70% in public schools of higher learning, and 30% in private schools, and I will be very much surprised in the next twenty years if we don't come to a point where public schools will have about 80 or 85% of the total number in higher education, rather than the 50% they have now.

Now, when I say this, gentlemen, I'm not throwing barbs at public schools, and I am not criticising public universities and great state universities, and land grant colleges. What I am saying is that we have a tremendous asset in this country from the fact that there is this balance in higher education. A balance which has kept our state schools reasonably free of political interference, and if this balance, once disturbed, will open itself up, I think, to many other consequences, which we don't like to face, and many consequences which I faced in South America during the summer, I would hope that it is certainly in the interest of every private citizen of this country to think about this problem, and to see what might be done, and to see that if we might strengthen from private resources our private schools, so that if we can't keep up to the minute in numbers that we are educating, at least we keep far ahead in quality, so that what we lack in quantitative position, we can make up in qualitative leadership. Here I come to what is probably the greatest problem that faces any private school administrator today in the field of higher education. I can illustrate this very briefly just in the matter of a physics professor.

We had a young man last year who came to the university. He had had his Ph.D. from the University of Michigan in nuclear physics. He had spent three or four years at Brookhaven National Laboratories in Long Island, and had a tremendous recommendation from them. He was one of the finest young professors in nuclear physics that we were able to find and add to our faculty. At the end of the year, we had treated him very well. We had given him practically the whole year to set up a lab for advanced research. We had only given him one class to teach, so that he could get this lab work under way and catch up on the teaching, which he was a little behind in, having been in the National Laboratory of Brookhaven, and at the end of the year we gave him a \$400.00 raise, which, in our book last year, was a fairly good raise, although it is really not an awful lot of money when you think about it.

Lab all set up, but I still have to live with my wife and children," and he said, "if my wife knows that I can make \$3000.00 more by working out in Iowa, than I can working in Indiana, I am going to have to do some fast talking to stay in Indiana." Well, we said, "what do you want to say here. We mean, what do you have to have to stay here and pass up this other offer." Well, he said, "if I can have a Thousand Dollars more, I would settle for that and pass up the other Two." So, we said, there is no point in arguing about that. We wanted this man badly, so we gave him a Thousand more, and he stayed and passed up a \$2000.00 advance. He had no sooner sent word to the other university that he was not accepting their offer when they wrote back and said if we didn't offer you enough, just let us know, and we will offer you more.

Well, this is the kind of competition that can cut the heart out of the private school, because we can't just go to the legislature and say we want a million dollars more this year for increasing the salaries of our professors. But, whether we go to a legislature, or go to the body public at large, we have to increase the pay of our professors. I don't know if you gentlemen have seen some of the studies that have been made lately. McGraw Hill made one of them, and several other companies made these studies, but they have showed conclusively that, as a class, the professorial class in this country has made the least economic gain since the war of any other class including hod carriers and bricklayers, and mechanics of all kinds; white collar workers, doctors, lawyers, professional men. This means that, as a nation, we don't put very much stock, at least, in the point of view of what we pay these people on their services. It means that, as a nation, we don't hold them in the kind of repute that they have coming to them....as the people who have our young people in their hands for their education, and I think this is something that we have to think about very seriously. If there is any one single thing that I feel that Notre Dame....and I am sure many other college Presidents would echo this....must do within the next year, is to do something radical about the kind of salaries we are paying to our professors, because the kind of salaries we are paying them today are so small, compared to the kind of salaries they can get in business or any professional life, and many of them are professional men, I wouldn't blame them if they all got up and walked out tomorrow morning. I mean they would be justified in doing it, and I couldn't blame them. I don't know what keeps them on....maybe it's loyalty, maybe it's devotion, maybe it's because they feel they are doing something very worthwhile, but I can't find it in my heart to see that because a man does something worthwhile, he should be penalized for it, and that his youngsters shouldn't be able to have as good clothes as the other kids in the neighborhood, or that he has to drive a car that is five years old, or ten years old in some cases; or that his wife can't get a new dress now and then, or that when his kids get old enough to go to college, he can't send them to a decent college, because, while he has been in the business all his life of educating college boys, he doesn't have enough money set aside to educate his own.

So, I think that this is the key problem, and to this problem we have been addressing all of our efforts during the past year or so, and we are making studies now of every great university in this country, and we are finding out what they are doing to try to hold their faculties, and as soon as we find out what they are doing, we are going to decide what we can do, and I hope it will be better, because I can tell you gentlemen tonight, that if we want the kind of university we hope to have at Notre Dame, we will only have it with a tremendously distinguished faculty, because this is the heart of the university; these are the people that do the job, and to get a tremendously distinguished faculty, you have to pay these people. I think, a



we are bound to fall behind qualitatively, in this sense, that the state schools will run away with all our top professors. This is one of the great crisis for the future of this country in the next twenty years, and I don't know how to face the crisis except to say that we have been blessed in our Notre Dame Foundation in the tremendous help we have gotten around this country, and I trust that in the years to come, as this help grows from our Alumni and friends, we would like to put the lion's share of it right back in the pockets of our professors, and I would like to be able to announce a salary scale so fine for our professors, that they wouldn't think of going any place else, and that we could attract good professors from other schools too. Well, there is the number one problem I wanted to talk to you about tonight.

I think, from taking a look at a country like South America and trying to diagnose what is wrong with their educational system, and if you find out what's wrong with the educational system of these countries, you will find out what is holding them back from the kind of progress they could and should make, because they aren't getting the kind of management, they aren't getting the kind of leadership, and they aren't getting the kind of inspiration and vision from their young people, and they aren't getting it because they aren't being educated to it, and if we want this country to grow and to be great, and to have this wonderful freedom of education, which, I think, has characterized our country; if we want to have this balance between public and private that will keep our schools free as they must be to do their job, then I think we must think to the future, and what we are going to do to keep our great private schools alive. This is a task that all of us have a stake in, and perhaps I am being a little ominous tonight in reading the handwriting on the wall, but I simply can see no other answer to this problem, that unless the private interest of this country keep the private schools alive, they are going to die, or they are going to get so depressed in competition with public money, that they simply won't be able to exist, and the day that the private schools cease to exist and to be strong, and to stand for the highest quality of education, that's the day you will start looking out for public education, because it will indeed be in trouble, and the money spent will be much more.

The second point I wanted to talk to you gentlemen about tonight has to do with science. This again gets into the problem of education, because certainly we are living in an age of science, and there has been no fact of education so startling in our age, I think, than the advance of science. I would like to approach this from several points of view. One thing I would like to say is that just from a personal point of view, and I trust you will forgive me the personal reference, that is, that during the past year I have become involved willy-nilly in several important scientific undertakings. One has to do with the Midwestern University Research Associates, which is a group of some fifteen midwestern universities, and we were given the job, by the Atomic Energy Commission, to design and construct the world's dream accelerator. A great atom smasher, not in the billion volt variety, but the multi-billion volt variety.

As you may know, the largest atom smasher in the world today exists of cyclotron at the University of California, at Berkley....it's a six billion volt.....6 B.E.V. they call it....billion electron volt cyclotron. We are presently building one at Brookhaven that will probably be in the area of twenty billion volt. The Russians, next year, will commission a twelve to fifteen billion electron volt machine of very high design and very excellent workmanship, from what we have been able to see of it. As of next year, they will be out ahead of us in this field. We will catch up in 1960, I hope, with the Brookhaven machine, but the Russians have already announced a fifty

that it takes to keep this whole city lighted up for several days, and it would be in the multi-hundred billion volt variety. Well, there in this endeavor I have, of course, come in contact with many of the best physicists in this country, and I have had a great opportunity to talk with them, and to get their point of view on things.

A secondary in which I have come in contact with science, and this is all background and preliminary to what I want to say about science in the world today, has been on the National Science Board in Washington where, for the past 2½ years, I have been working with a number of men selected by President Eisenhower and commissioned, by law, to legislate for all of the basic scientific research in this country. We have a budget that is in the area of fifty million dollars a year, and it is growing almost in geometric proportions every year, and our job is to study and to make recommendations to the Congress as the National Science Board for all of the basic research covered by the Government during the next year.

We are, for example, putting on the satellite program that will put up this satellite to travel around the world....distances from an orbit from about three hundred to a thousand miles above the surface of the earth, and traveling eighteen thousand miles an hour. It will go around the earth every ninety minutes, and we are setting up stations to monitor this as it makes this track, and we hope to find out a great deal about the upper atmosphere, and about the distribution of a mass on the earth's surface....something about radio activity at those altitudes, and something about resistance that will get into later space flight. We are also putting on the Antarctic exposition, and if I hadn't been so busy these last few months, I would have been able to leave with that exposition in December, but I am so far back in my work, and with one other thing about which I want to speak to you tonight, I'm afraid I am not going to get to the Antarctic this year; maybe next year. We could schedule this talk a year from now at the South Pole. But, in any case, in these activities, plus those in the National Science Board generally, I again have come into contact with much of the advanced scientific thinking in this country.

The third thing I want to mention is that during the last part of September, and the month of October, I spent at United Nations as the Vatican delegate for the Atoms for Peace Conference, and I want to say a little bit more about this, because I think it significant, and then I want to try to draw some educational conclusions from reactions I have had to this growth of science in our country.

You may know that in 1953, President Eisenhower announced to the world, through United Nations, that everyone is worried about the atom, because we always connected the atom with the word "bomb," and that he wanted to do something to bring this atom and its potentiality into uses for peace as well as for war. Well, following that, there was a little contretemps with the Russians who didn't want to get into this unless we would ban H bombs without having any kind of control to see whether or not it was being done realistically, but we got to work and tried to set up a statute....a statute for a world agency that would help the undeveloped countries of the world get some use out of the atom from a central bank of atomic energy, and be able to develop themselves quickly through this agency, as they would never be able to do in any other means. Once we got this statute started, many countries got behind it. Countries that give raw material, like Portugal, even Czechoslovakia, Ethiopia, Canada; people who have large stores of uranium. Then we got many of the big powers behind us....the United Kingdom, France, India, and a number of the other countries. Following this, the

It was really a constitutional meeting to set up an agency that would go to work and try to bring power to the undeveloped countries of the world. We met for 30 days, and it was the largest international meeting ever held. There were eighty-two nations from all around this world gathered at this meeting down the street here on the East River. We had countries as far distant as Australia, New Zealand, sitting next to countries like Afghanistan, and Israel, and Egypt, and all the Latin American countries, and we found one very important thing at this meeting that I would like to try to convey to you tonight.

First of all, these people suddenly began to realize that here we may be on the brink of a new industrial revolution. As you know, many of the tensions that exist in the world internationally today, exist between have and have not nations, or developed and undeveloped nations, and there are many nations in this world that simply don't have coal, or oil, or gas, or hydro electric resources, and, as a result, they can't get the basic energy to move; the basic energy to develop factories; the basic energy to do the things a country has to do to start to come out of the dust, and the industrial revolution of the past has never reached these countries, because they simply lack the basic element of power and mobility.

Well, now comes along this thing called atomic energy, and we have, even in this first stage of very preliminary scientific research, turned out machines to generate electricity that almost look like a perpetual motion machine. It would almost be like your burning oil, and your end product is gas, and you are getting power in the process, because actually, in these nuclear reactors, you start with some raw material, uranium or thorium, you put in some fissionable material radioactive, like uranium 235, and your end product is more fissionable material, and in the meanwhile, you are turning out tremendous heat energy that, of course, is used with liquid sodium, which generates steam, which, in turn, runs a turbine much the same as a hydro electric power or steam turbine nowadays is run, and you get electricity. But, after you have run this thing for a year, and you've gotten electricity for a year, you wind up with more fissionable material than you began with, so in a sense, you burn your fuel, and the end product is, you get more fuel.

The problem that was worrying us in this agency was that this product of more fuel also happens to be the product out of which is made the atomic bomb....plutonium....and we were quite worried that there should be an agency, and President Eisenhower made this very clear in his opening statement to the United Nations in 1953....that he didn't want to set up an agency to help people, and wind up having it eliminating people through more bombs, and that somehow, if we couldn't have this thing unless we could work out a system of controls, and it's too bad the dramatic side of this meeting was somewhat obscured in all of the eruption that we had in the middle East, and in Hungary, right after this announcement was made, but the startling thing about this meeting was that eighty-two nations of every shadow and color....nations with all the built-in tensions of the Soviet block....the Arab block....the Latin American block....the western block, got together and voted practically unanimous after long discussion and debate on every single issue of this statute. We actually did establish, and the first day of its establishment, 70 of these 82 nations walked up and signed the statute for their countries to put into creation, and into being, this new international atomic energy agency, and don't think it's just a question of power, because we've just begun to scratch the surface of what we can do with the atom.

I don't know if you gentlemen have known of the many medical cures that are already being worked out with atomic energy; how you can detect ill-



and treat including some things verging on cancer, which we are working on now, just by the use of this radioactive isotope, which is the result of the fusion we talk of in fission in atomic energy.

Beyond that, let's take a question like the production of food. You can actually radiate seeds, and as a result of this, get barley that has much more straw in it, and yet much more grain on the top. You can turn out kinds of plants that are resistant to all kinds of plant rust, that in the past, has destroyed many of our grains....before the harvest in this country. You can radiate food, so that a food that would normally spoil in a couple of days will last several years without spoiling at all, almost without refrigeration. You can take foods that can't be preserved for very long like milk, and yet, just by radiating them will keep for ten times as long as they would normally. You can take a sack of onions, for example, that if you leave them in your cellar very long they start sprouting roots out all over the place; just give them a shot of radiation, and there's no budding at all taking part in those onions. Beyond this, there are many other uses that this can be put to, and I wouldn't be a bit surprised, gentlemen, if we aren't coming to a point where we have on our hands, and have before us, a really giant industrial revolution that is probably going to be greater than the industrial revolution of the past....for nations that before were grubbing for an existence can have power cheaply and reasonably, and can begin to develop and to have better crops, and to preserve their food, and get it to market, and to have mobility.

This was what was behind the thought of the President when he proposed this Atoms for Peace. I think it was this positive thought of something everybody wanted that brought all of these nations together, and kept them together for 36 days, and got them so enthused about this thing that they buried their differences to try to do something good for everybody, and this went so far that even on the matter of control, there wasn't one dissenting voice in that whole body on the principle that there should be some control of this, because it was a dangerous process since its end product is fissionable material.

Now, there was a lot of argument, and many days of argument on what kind of control we ought to have, and I think we tried to bring out, many of us in the delegations, the fact that there should, at least, be a realistic control, and that no control is realistic unless people accept it with good will; even God's Commandments aren't realistic control if you don't accept them, and try to live by them. But, then what we ought to try to do, is, try to get used to living with control in this world, and if we can control the peaceful use of atomic energy, let's hope that we will be mature and big enough a few years from now to start having some control in the destructive use of atomic energy. The wonderful thing is that every atom that is put into this pool for peaceful use, is an atom taken out of the pool for military use, and the United States, I think, accomplished a very dramatic move before all the nations of this world when, at the closing day of the conference, they said President Eisenhower sent a message to Admiral Strauss, the Chairman of the Atomic Energy Commission, to the effect that we would begin by giving them about eleven thousand pounds of uranium 235 to begin this process, and then, secondly, that until 1960, I believe the year was, we would match every bit of fissionable material that was given the agency by any other country, which means, practically, that every bit of material that Russia gives, we will match it, and which is saying, indirectly, that every ounce of material they take out of military use, we will take an ounce out of our military use.

Now, I think, gentlemen, what I wanted to get to on all of this is

For this reason, I would like to close tonight with a few words about man and science, because this is a thing that has been born in on me by these experiences which I have just related to you. You know, first of all, I don't have to tell you gentlemen the wonderful things that science can do. I think you can say that science had fed us, clothed us, and housed us as we have never been fed, clothed, and housed before. You can say that science has brought the world closer than it's ever been before. You can travel to any capital on the earth in about eight hours, once the new jet airplanes come in. You can talk across oceans and across continents as easy as you can talk from room to room. You can have entertainment, as you sit in an easy chair, at the flick of a button. You can have so many advantages today that were never possible before in the way of light, heat, and cooling, and the mobility today is tremendously advanced over what it was before. Housekeeping is simplified to a fact that it's done by push button style today, and these are the things that science can do, and it has cured our maladies, many of them, and it has given us short cuts to health, and it has given us new antibiotics, and new vitamins.

After you think of all the things science has done for us, just think of this one point for one moment, gentlemen. There is nothing that science has done for us that has effected our souls. All of these things have effected our body, our comfort, and our material well being. For example, a man can be hail and healthy, but he can also be intolerant and unjust. A wife may have very simplified housekeeping, but this doesn't necessarily make for a happy marriage. You can travel from continent to continent in a matter of hours, but this doesn't necessarily promote international understanding. We have communications today that are fantastic; not just dictating machines, but television and radio, and all of the advances in electronics and wireless. Yet, this doesn't guarantee us that people are saying substantial things today, and that the type of entertainment we are getting is high type. All I am saying is that vitamins can't substitute for virtues, and that there are certain aspects of human life which science can't touch, because I think you have to understand science, and to know that it is something that has to do with nature, and the manipulation of nature, and this is a material thing. Yet, if you are thinking of man and his education, his future, and his destiny, this is not just a material thing, because there are aspects of man that go far beyond anything that science can do.

Take all of these tremendous machines we have today; the hundred billion volt cyclotron that I was talking about earlier. Take the electron microscopes that can magnify something 100,000 times. Take things like your univac, which can do problems that would take six professors six months, working day and night, to do, and they can do them in a matter of a few seconds. Take all of the tremendous things the new oscilloscopes or mass spectrometers, or all of the other scientific gear we have, even for radio astronomy, and the rest. Take all of these things, and put them together, and take all of the scientists in the world, and put them working on these things, and they can't answer one of the really human problems we have today. For example, they can't tell you what peace is, and how can we understand the terms of peace, and what we should do to live at peace with ourselves, and with our neighbors, and with the world. They can't tell us, for example, anything about the tensions, and the prejudices, and the injustices of this world, because these aren't material things, these are spiritual things. They effect the nature of man. They can't even tell you what man is, and why he is here, and where he is going, and what is the human situation we are living in, and what are the real goals for tomorrow beyond the material goals of health and comfort, and material prosperity. They can't begin to tell you anything about beauty, for example, or anything about justice, as such.

that is a kind of wonderland of science. But, we are also living in a world that is inhabited by human beings, and the scientists, themselves, are human beings. The science and the applications of science that are going on today, are going on, not in a vacuum, but in a world of man; a real world in which we live, and have our being, and unless our scientists, themselves, have this broad liberal training that I have spoken to you about so much....unless they have some concept about man, as well as of nature, some concept about God, and some concept about spiritual values, some concept of charity and justice, and peace, and beauty, and happiness; things that are not realities coming out of a machine, but realities that are deep inside man, and the people yearn for, and live for, and are dying for in some parts of the world tonight. Unless we have a realization on the part of our scientists, and on the part of all of us who live in a world of scientific advance, of these deep human cultural spiritual values, then I think we can become a very poor people while we live in greater comfort and material riches, and that is why I think, as Educator, and you gentlemen, as people interested in education, should think very seriously, first of all, that science be in the education we give today to our young people, but also that we educate them for something more than scientists, because after all, the people who invented the hydrogen bomb can't tell you today whether or not they ought to use it, because they're all divided on the subject, and this is not a scientific question....this is a moral question that has to do with man, and his future, and the future of our next generations. The people who invented the univac can't tell you what questions to ask it, because these are philosophical things, and there are many philosophical questions that even a univac can't answer. I saw an operator on election night asking stupid questions of the univac, and naturally, he got stupid answers.

I would like to say that the big tension of our day is not going to be just this advance in science, because it's here, and it's honest, and it's moving fast, and it's going to move faster. But, I would suggest that maybe one of the great tensions of our day is that we spend over five billion dollars a year on science, and you can't get five million dollars to spend on the humanistic studies, on arts, and on the other things that go on in the university. That a boy can go into science, and study in science, and have fifteen people trying to get his services, but if he studies history, or literature, or art, or something else, they say, well, he is an astronomer and an egg head. It seems to me, gentlemen, that we don't want a society that is purely technological.

Now, I agree with you that Russia may be turning out more engineers than we are, but if that is all they are going to turn out is scientists and engineers, the day is coming when they are going to have serious internal trouble, because a person who just knows science and nothing more, by definition, does not know about man. He may know how many atoms you have in your body, and what the chemical composition of your body is, but he doesn't know what man is, what he is here for, what the human situation is, what western culture is that has come to us from the Greeks....the Romans....and the Gospel. We can't tell you the things....the real burning questions that tear at the heart of man and need an answer. He can't tell you the inter-anguishes of man, and the answer to those things, because these are beyond the material; they're things of the spirit, and they're things of man himself. I would feel sorry for Russia if all they had was scientists, because it would be a very sterile and a purely technological education, and there wouldn't be any sense of freedom, or any knowledge of freedom, and there certainly wouldn't be any beauty or any religion, or any culture. We can get the same way if all we think about is this numbers game of matching them scientist for scientist, and forgetting to ask what else should we be training

where is man going, and the great question is not what makes man comfortable, but what makes man happy, and the other thing is that while we all want health, and it's a blessing of God, and science can help keep us healthy, there are other more important problems in life, and the more important problems have to do with the spirit, and those are the problems that only come from a liberal education that teaches you how to think, and how to draw the right kind of judgements in life, and how not to be guided by prejudice and passion....to be free of these things, and how to be a man of discernment, and a man of judgement, and a man who has real values, and can discern between these values. I would hope that everybody in science and technology would have this kind of a background to his education. I would hope that as this science develops in this country, as indeed it will, and should, and is a good thing, that other things will also develop, and that we will come to know of our heritage, because if we look on science as merely the great defense against the people who try to obstruct our way of life today, there comes a danger that we might become so enthralled by the weapon, that we forget what we are really defending, and what we are defending is not material comfort. It's not just health as health, or comfort as comfort, or material prosperity as material prosperity.

I think what we are trying to defend, and what we at the university are trying to give our students is a sense of man in his totality; a man who is of high dignity; a man of alienable rights; a man who has a right to live in this country and freedom, and to breathe the air of freedom; a man who has compassion for other men, and other people's problems; a man who is generous and magnanimous, and is willing to put out a hand to the other person in need; a man who has values and can appreciate things that are beautiful, and can cherish things that are good; a man who lives in a material world, but doesn't live by bread alone, who has values that go higher than this world, and is striving for those values. This is the kind of man that we are interested in at Notre Dame. I hope that we will always be interested in science too, but I hope, between these things, there will always be a balance, because science can make man comfortable, but only wisdom can make man happy. Thank you very much.