I deeply appreciate this very kind reception and the introduction my brother Carlos has given me. He is the kind of brother who exaggerates. Everything he says is from the heart, but not always entirely correct. I want you to know that in addressing you this morning, I am conscious of the fact that you represent some 21,000 Rotary clubs in 159 countries of the world, with nearly one million members. The spotlight shines so strongly in my eyes that I cannot see a single face, but, I am conscious of all the faces in the world that you represent.

I would like to think that I am a disciplined person and, therefore, having been allotted 30 minutes to speak to you this morning, I had to make a road map for myself—I won't necessarily stick to it—but I have an outline to indicate what it is that I want to get across to you. Perhaps, if I tell you what I've written down as the title for what I want to get across to you, it will give you an indication of where I am going and where I hope you and your one million constituents—nearly one million constituents—will also go.

The title is "Rapid Elimination of Polio in Developing Countries." I also like every word to mean what it says and be purposeful. So I will emphasize the words in the first part of the title, "Rapid," and not by the year 2005. Maybe that will be the last little country to get there, but "Rapid," if it can be done and where it can be done.
The second word, or phrase, is "Elimination of Polio," not just diminution. I am fully aware that in many places it will not be possible, but, where possible, "Elimination" is the goal, not just diminution, and the place is the "Developing Countries," not the entire world.

The final part of my title, which I will hope to address is "Challenge to Rotary International."

This is 1985 and to me it represents the 25th anniversary of the first administration of the oral polio vaccine to one hundred million people—the 25th anniversary. You may ask, "Why do we still have a problem?" Where is the problem? The point is that, because of circumstances of initial studies, the first one hundred million children to receive the oral polio vaccine was in the Soviet Union and its satellites. This occurred because the opportunity for working together and answering those questions that had to be answered on a large scale could only be carried out in the Soviet Union and with a common purpose, where there were colleagues with whom it was possible to answer questions that could not be answered anywhere else. So, at the end of 1959, after approximately 15 million persons in the Soviet Union had been involved in field trials, the Ministry of Health, at the end of December, said that this vaccine should be used for the elimination of polio and that it should be done within six months. My colleague, Professor Chumakov, director of the Polio Research Institute in Moscow had already anticipated this and had turned his research institute into a vaccine production institute, and within the first six months of 1960 one hundred million children under 21 years of age, 77 million in the Soviet Union, and others in Czechoslovakia, East Germany, Hungary, Bulgaria and other eastern European countries, were quickly immunized against the three types of poliovirus.
This was the first time anything like it had been done anywhere in the world, and it demonstrated, at a time when epidemics were still occurring in most other parts of the world, that the rapid administration of oral polio vaccine could quickly eliminate paralytic poliomyelitis as a public health problem. Even though, in some areas of such a huge empire as the Soviet Union, complete control was not immediately possible in such tropical areas as Central Asia, etc.

I will not go into the history of how the rapid elimination of polio program spread from there to the rest of the world, but it is at least 20 years now, that oral polio vaccine has been used on 99.5% of the world's population with the exception of a few countries like Finland, Sweden, and Holland—and it is estimated that in the temperate climate countries of the world, inhabited by about two thousand million people, approximately five million paralytic cases of polio have been prevented in the last 20 years.

Where is the problem now? The problem now is in the developing countries of the world, by and large inhabited by almost three thousand million people. What is the magnitude of the problem? Well, according to WHO (World Health Organization) estimates, in 1983 there were approximately four hundred thousand residual paralytic polio cases in the economically developing countries, excluding China, and if the present conditions of vaccination in those countries continue—because these people, these youngsters, remain paralyzed and grow up with handicaps—it can be expected that in the next ten years there will not be much of a diminution, but there will be almost four million paralytic cases that have not occurred.

Sometimes I get myself worked up and suddenly remember when I said "four million cases that need not occur", and then see my friend Sergio Mulitsch from Italy,
sitting here; it reminds me of an experience in Italy, about 22 years ago when Italians were doing the best they could, using the Salk killed virus polio vaccine, but about 4,000 paralytic cases a year continued to occur. By that time it had already been demonstrated what rapid mass vaccinations with oral vaccine can do. I said, to an assembled group of officials in the Istituto Superiore di Sanità in Rome, "If you don’t change what you’re doing, next year will be like the year before. And there will probably be another four thousand or more paralytic cases of polio in Italy." Like Emile Zola said, "J’accuse"—I accuse you, the policy makers in Italy; you will be guilty of those four thousand paralytic cases and some hundreds who will die, that will probably occur next year."

I am not saying now that you will be guilty of the four million paralytic cases that will accumulate in the next ten years. But I think that we, as human beings in the world, will be guilty if we do not try to change it. Now, how do we know that there is so much? Certainly it’s not the reporting, the reporting is useless. It was not until, less than about eight years or so ago, that we realized that paralytic polio was a problem in developing countries, because, myself included, all the "wiseacres" believed that, in the developing countries with poor sanitation and hygiene and with crowding, there is a great deal of infection and acquisition of immunity early in life, and very little paralytic disease. Well, that was just about as wrong as anything could be, and it was proved, not in some great research institute in a developed country, but in Ghana, on the equator in Africa, where there were no epidemics of polio at all, where the number of reported cases was so small that there was "no problem."

What they did in Ghana was go around in the small towns, in Accra the capital, and other places—house-to-house and in the schools—to see how many crippled
children there were and whether the kind of crippling was due to polio or to something else. Then, it was realized in Ghana at the time, that the amount of paralytic polio they found was almost twice as great as there was in the United States before the vaccine era, as reported cases. Very few were reported in Ghana. Thus you may have officials in a developing country who say, "We do not have a polio problem. In the last year or so, we have had maybe two cases of polio." This means nothing, because since this survey was done in Ghana—it was also done in many other places in Africa, Asia, and also Latin America and I was personally involved in making a study in Brazil in 1980—it has now been established that the most important places where paralytic polio is a problem is in the developing countries, and the way you know it is by these lameness surveys.

Now why is it—(I didn’t watch the time. You let me know, because when a half hour is up, I stop.)

(I’ll never forget my first talk to a Rotary Club in Cincinnati, Ohio. Excuse these digressions, but they invited me to talk, as you just did, and I turned to the chairman and said, "Tell me how much time do I have?" "Oh," says he, "you’ve got all the time in the world, only come two o’clock there will be nobody here." So I’m going to try to get my points across before the time is up.)

I think you have to know something about the natural history of the polioviruses and the paralytic disease before you can understand the whole approach. Polioviruses have only one place where they can survive in the world, and that is in human beings. It is a kind of coexistence. They multiply in the intestinal tract and are excreted with fecal matter and transmitted from person to person. Where the conditions of sanitation and the climate is most conducive to that, you have extensive dissemination of polioviruses all year-round. We
know that the amount of polioviruses being disseminated in the tropical and subtropical countries, where the temperatures allow for the dissemination the year around and where poor sanitary conditions help in such dissemination, maybe anywhere from ten to a hundred times more than that which happens in temperate climate countries, where dissemination—again by very small children—occurs mostly during the few hot months of the year and the cold weather itself shuts it off.

Now, what became realized, as I said from the lameness studies in Ghana, and later in many other places, is that this is not a harmless dissemination. It takes its toll. Why is it that it has been possible, practically, to have control and elimination—either complete or almost complete—in the temperate climate, developed countries and also in some subtropical or tropical countries with good health services, such as in Puerto Rico, Singapore, and some places in Asia, and in the subtropical areas of the United States and Japan and not elsewhere?

The challenge is the rapid elimination of polio, and not over a period of ten or twenty years. There is another principle that I would like to get across to you. If you had a theoretically perfect vaccine, of which only one dose would be enough, which would give life-long immunity, and it reached only a small proportion of the children—the persons who need it—and you gave it year-round, the wild paralyzing polioviruses would continue to circulate, and it would take forever to eliminate the disease. We have to compete with a long-standing coexistence between polioviruses in human beings and produce a rapid development of resistant intestinal tracts, where the virus has to multiply, and then maintain this resistance as millions of new children are born each year.

This kind of program was done in the United States in 1962-64, which was not the
first in the world. First, it was in the Soviet Union and satellites in 1960, and then in Japan in 1961, when in the face of a severe epidemic, they discovered how they could organize quickly to stop the epidemic of polio by vaccinating 13 million children in a short period of time. In the United States, however, it was done entirely through voluntary activities in the communities, not by the public health service. County medical societies got people organized and had these programs on Sundays; it took them two years to give the vaccine to about 100 million persons of all ages. It was followed up by annual immunization of the children and then the United States reached a point which, I think, is unequaled by any other country in the world. In 1984, this past year, there were in the United States two hundred and forty million people, and only four reported cases of polio for these two hundred and forty million people. These four reported cases may not all have been polio caused by polioviruses, because paralytic diseases simulating polio can be caused by other conditions, and there are also some related viruses which can cause typical polio and there are no vaccines against them.

During those mass programs in the United States, when one hundred million persons received the vaccine, it represented only about 56 percent of the total population. It interrupted the chain of transmission of the virulent polioviruses even though millions of children didn’t get the vaccine in the ongoing year-round immunization program. The oral vaccine is unlike any other vaccine that has ever been used. The vaccine viruses spread like the naturally-occurring viruses and immunize children who have not received the vaccine.

This procedure has not eliminated polio in the developing countries. Why? I worked for many years in Mexico—long before I came to know Carlos Canseco. In
1959 in several large cities in Mexico, only 50 percent of the children were given the vaccine and they were protected. This was not enough to break the chain of transmission of the paralyzing polioviruses and the unvaccinated children got paralytic polio. Thus, it was realized that that was not the way to eliminate polio. Some very excellent rapid mass programs were then carried out in some cities in Brazil, in Rio de Janeiro and São Paulo, but what came later? Only a small proportion of the new children were vaccinated, the virulent polioviruses persisted and paralyzed the unvaccinated children. There are almost 90 to 100 million children born each year in the developing countries. At the present time, only about 20 percent of them receive any kind of an immunization.

What is obvious is that a single rapid mass vaccination can be carried out in many developing countries, but that is not enough to eliminate polio in the tropical and subtropical countries. It was then realized that in order to deal with the problem of year-round dissemination of large amounts of paralyzing polioviruses and of many other viruses in the intestinal tracts of those children in the developing countries—that it was necessary to vaccinate almost all children in a short period of time and to do it every year for all children below a certain age.

The basic work was carried out in Mexico in 1959. We gave oral vaccine to children in just a couple of days in the city of Toluca and then tested thousands of children for excretion of polioviruses and other viruses to see what happens. What we learned was that in the developing countries with year-round dissemination, it would be necessary to have annual vaccination programs and that the procedure used in developed countries—having vaccination not only against polio but against other childhood diseases, as part of their
visits to maternal and child health care centers—however desirable that maybe, is not the answer. It reaches only a small proportion of the population and is responsible for the four hundred thousand cases of paralytic polio a year, more than two million children dying—not just getting sick—of measles and complications in the developing world, and for close to a million children dying of tetanus of the newborn. Obviously, something else had to be done.

Where was the first trial of annual door-to-door vaccinations? Well, we constantly run into this business of the communists, and we have had a problem—because many people said that only communists can get organized. Of course, I think it is our challenge to show that certain things can be achieved for poor people before economic development brings health care to all and that they can be achieved without a communist government. In 1962-63, Cuba was the first country to start carrying out annual house-to-house vaccinations against polio on one day, twice a year, and polio was quickly eliminated and has remained eliminated for 22 years. How did Cuba do it? Cuba used the Committees for the Defense of the Revolution to make lists of the children under five years of age in homes and then on one Sunday, these same people would receive the vaccine, go into the homes, administer the vaccine, and that was that. I was allowed to go to Cuba in 1967 with the Director of the Pan American Health Organization (PAHO), to see if Cuba really had achieved the elimination of polio, and they had. The Pan American Health Organization was then considering asking other countries in Latin America to carry out similar antipolio vaccination programs, but the ministers of health said: where are we going to get committees for the defense of the revolution? And nothing happened for a long time.

It was not until 1980, when after many years of using extensive amounts of oral
Vaccine ineffectively and reaching only a small proportion of the children—that Brazil, not a communist country, with one hundred and twenty-five million people in a geographic area practically as large as the continental United States, did what people said couldn’t be done. They got organized to bring the oral vaccine to the people. They created an army of three hundred and twenty thousand volunteers centered around existing health services, with the help of every sector of society, including all the private organizations, people who owned boats and yachts, the army, the navy, and the air force. It was, perhaps, the best organized national preventive medicine program. And they have done it not just once, but ten times, twice a year, for five years. Polio has been brought under control in a way that it had never been done before. There are still a few isolated areas where paralyzing polioviruses maintain themselves in the population because Brazil is a huge country. You can have a program like that in a few areas and you may cover only 50 percent or less of the children, and that is not enough to break the chain of transmission of the paralyzing polioviruses—and a few cases of paralytic polio occur. This requires special vigilance and attention to such undervaccinated areas.

The Dominican Republic had used tremendous amounts of vaccine that was donated to them, but much of it went bad in refrigerators that did not work. Much of the vaccine never reached the children, and the Rehabilitation Association of the Dominican Republic wanted to do something about it. I told them to go to Brazil and learn how to conduct annual days of antipolio vaccination. Instead they insisted that I come, study the special situation in their country and recommend a specific program based on community volunteers. For such an organization, it is very important to have somebody in charge who can organize large groups and I found such a person. His name is Mr. Mejico Angeles Suarez. He’s now the first member of the Rotary International task force that is in the
process of formation.

I am going to tell you now what I think Rotary can do in addition to what has been done by other groups such as UNICEF, churches, and so on, to provide vaccine for poor countries. When Rotary first asked me five years ago to speak at the international convention in Chicago—I proposed that Rotary International undertake, as part of its 3-H program, to help governments organize community volunteers, people with little education and no professional training, into disciplined adjuncts to their regular health services that would work year in, year out, to bring vaccine to the people in their homes. It was after that, and when Carlos Canseco became president, that I was asked to write a proposal for a Rotary International Polio Task Force to help countries, where conditions are suitable, and where the government would want such help, develop a kind of organization that could carry out annual national programs of vaccination. As you know, this proposal was adopted by the Board of Directors of Rotary International and the Trustees of The Rotary Foundation. Then came the business of translating a prayer into action.

How do we translate a prayer for Rotary International to have such an international task force to help bring about the rapid elimination and continued control of polio translated into action? When I wrote this plan, and when Rotary International decided to adopt it, the World Health Organization and the Pan American Health Organization were among those official groups that believed it could not be done, that you could not do it. Despite the fact that the plan has been demonstrated to be effective in Brazil, the Dominican Republic, and to some extent also in Mexico, it was evident that Rotary International would have to demonstrate that such groups of trained volunteers can do the job annually. Hopefully it might then be adopted by the official bodies responsible for public
health in the developing countries so that what Rotary International would do on a small scale, might then be used by many similar task forces throughout the world.

There is something else I want to say. It was thought at first that only for polio was there a suitable technology—the ability to give just a couple of drops in the mouth, which any untrained person could do—and that it would not be possible to have similar national programs for measles, diphtheria, pertussis, and tetanus because these vaccines had to be given by injection. But now I look forward to the day, in the near future, when on the same two national days of vaccination against polio, it will be possible also to immunize against measles, diphtheria and pertussis, and also protect women of childbearing age with tetanus toxoid vaccines, so that tetanus of the newborn could be eliminated as an important cause of death of the newborn. Rotary International's role in the possible rapid elimination and continuing control, not only of polio, but also of other vaccine preventable diseases of children in developing countries also has great potential.

I am an optimist. The key to success is disciplined organization, disciplined activity—not guerrilla warfare activity, but rather the activity of a well disciplined international army.

To end as I started, I visualize one million Rotarians in more than twenty-one thousand clubs, in 159 countries—you can do a lot for human welfare and I think you will.

Thank you very much.