A Finally, after all the international conferences in 1960, in the autumn of 1960, particularly as I said before, the experience with almost 100,000,000 people getting the vaccine in countries behind the iron country. The Public Health Service had to make a decision and I think I would like to put on record here something that I think should be on the record now.

The Lederly Company, a unit of American Synamide I was told had spent probably 13 million dollars. I don't know if that figure is exactly correct--had spent a great deal of money in trying to get this vaccine accepted so or developed. And there was a running campaign against the strain that I was working with and there were all kinds of innuendos. The newspaper releases and articles in the Readers' Digest, that all we had was from the Communist countries and Sabin was working in Russia and so on and having very bad connotations at the time and really it wasn't quite above board. It wasn't a fair fight so although I never said it, the Bureau of Biologics called me up. I won't mention names but people from the bureau. They were not called the Bureau of Biologics then.

Q The Division of Biological Standards.

A And asked me whether, if they approved my strains for production of live oral polio vaccine whether I would give them to the Lederly Company which they had reason to believe that I was not very sympathetic to because of what they had been doing as I said I would give the strains to
anybody in the world who had the proper capacity to do it under the proper control because at that time I was the only one who had written the controls of how it should be done on a mass scale. There had not yet been any national or international regulations. Because they told me that if I did not—in their discussions with the Lederly Company—the Lederly Company would fight in the courts. I said of course I would give it to the Lederly Company. Of course I would give it to the Lederly Company. And I heard a big sigh of relief. You can't imagine Albert what you have just done. You have just taken a load off our minds because we have an agreement with Lederly that if they, that if you will give them you strains they won't raise any more rumpus but they will go ahead and make vaccine from those strains. In August I think 1960 which is about eight months or so after the Soviet Union had officially accepted these strains the United States announced that these strains would be the basis for production of live polio virus vaccine. But neither Lederly was ready—it wasn't like the Soviet Union because in the United States you had to go through certain standards, the Division of Biologic Standards hadn't yet written their standards of production. There was no vaccine. There was an acceptance. There was no vaccine. The only vaccine that I had were hundreds of thousands of doses from the basic material originally prepared by Burke Sharpe and Dome. So we faced two situations. I think also however before that and I think you are right now that I carried out--. There were big studies carried out in the United States beginning
early in 1960 with the material that I had. So let me go back to those tests.

Q Yes.

A The first one was a study at my adopted home town, Cincinnati. I adopted it. They adopted me. And the school board and the health department, they all had to hold meetings to decide whether or not to have a vaccination program in the children. Now this data is published but I will just capture the highlights, what was involved because it was done in two stages.

First, with the cooperation of a couple of hundred pediatricians who were on the staff of the Children's Hospital where I had my laboratories and others. Frankly I don't remember now whether we did school children first and pre-school children. At any rate wait there was one phase in which first about 85,000 were done. But ultimately before the summer period of polio, the usual polio season came along, a decision was made to vaccinate in several stages about 180,000 or so--

Q Your figure happens to be right here.

A Alright. With 180,000 school children and some pre-school children. But I did mostly school children. But, again, I had the big staff that I had at my laboratory. Not just to inoculate and see what happens. We made a study of the viral flora in the population before we introduced the polio vaccines. We made a study of the age distribution of antibodies to all the three types. In other words, how many
parents, young parents of school children could be expect to have no immunity at all. It was a study now in an American setting for the first time let's say comparable to what was done in Czechoslovakia to determine a number of things. The flora that we were dealing with prior to. What would happen when part of the population got vaccine and it would spread to the others because they would spread it to other children in the home, to preschool children you see, to parents who had no immunity. And then we continued a strict surveynance on every person that came in with any sort of neurologic manifestations into the hospital and it was a clinical, laboratory operation in which we tried to determine in an American community what happens when a portion about a hundred a big portion of the population. And also we selected certain ones for development of antibody as we did in Taluca. And the job of following through every patient with neurological manifestations that was admitted to any hospital. It was a network. Oh, it was a military operation but I had some very excellent help. I remember particularly a young pediatrician who came to work in my laboratory. He is now professor of pediatrics at the University of Pittsburg, Dick Michaels. He was wonderful. His relationship, his ability to work with pediatricians around the city it is another long chapter that we can't go into.

Q That you don't want to talk about.

A I do want to talk about it Saul but we don't have time. We can spend a year talking about those things but we've got to compress it. The point was that at the same
time we were doing that Rochester New York decided to do a similar thing so that we had prior to the time that the United States Public Health Service made a decision on its own in August, 1960 there were these two things that happened. And furthermore what happened then was the interesting thing that we saw again how the polio viruses spread and took over. We knew that it spread because we studied other members. And furthermore there were three deaths that year due to paralytic disease in young adults. And they all turned out to be Landry's Paralysis. That is the--

Q  Myelitis.

A  The--stop it a moment.

What they died of was the Guillan Barré Syndrome. I don't remember now whether all three died or three didn't but it is in adults very often a very fatal disease. And these things could very well have been diagnosed as polio and if it had been a mass campaign in which everybody had gotten the vaccine we would probably have isolated polio virus from their intestinal tracts. But as it turned out they didn't have any virus. But there it was. I mean during this period of observation and there were cases of aseptic meningitis from which we isolated other viruses. And there was also a paralytic case in which an echo 6 was isolated and it was very fortunate it was a child that had not received any vaccine. There was no antibody. It was an uncomplicated thing of echo 6 paralysis which incidentally did not disappear. We learned many interesting things and furthermore we learned that under
conditions obtaining in Cincinnati when we gave the three types separately in series one after another 100% of the children who had no antibody converted.

Q 100%?
A 100%.

Q The reason that I say that is you don't get that kind of—.

A Well you do get when you work carefully by God. You see. When Dorothy Horstman worked in South America or others you got a little bit of blood drop on a piece of filter paper and they diluted it and the dilution. But when we were able to test the serum because we bled the children. We bled large numbers you see and we could use the whole serum and test it in a dilution of 1 to 4, 100% because there is always a spectrum you see if you set your dilution you start at a certain dilution you cut off the spectrum of those who go from nothing to a low response you see. But when we did it very carefully it was 100%. So we were able to show that under the conditions obtaining in an American community such as Cincinnati this vaccine fed as at least my concepts indicated it should be fed, giving each one individually, you see and following through without interference from other types you can get 100% conversion.

The other thing of course is there was only case of polio in Cincinnati that year and he was imported. He picked it up somewhere else. Not a vaccinated one. Nobody in contact. There were many interesting things which is contained in the
publication. Now these are the things that led up to the final approval by the U.S. Public Health Service. Now what happened then, the two things that I had in mind are the following. There was no vaccine available in the United States. What was happening was that in the summer of 1960 I don't remember. Certainly in 1961 there were a number of epidemics in the United States while the use of the Salk vaccine greatly decreased the number of paralytic cases there is no question about that. It did not eliminate epidemics and thousands of paralytic cases were still occurring. And one of the most striking epidemics was in Syracuse where despite the fact that extensive coverage with four doses of Salk vaccine there appeared a very severe outbreak of polio that just began. And one of my other associates, Dr. Harry Felgram, who was there worked with the health department and they tested. And this was done in a number of other parts of the United States and other parts of the world where there is no vaccine. They tested what could be done with a live virus vaccine when there was evidence that an epidemic was developing and you came in with a mass administration. Could you suddenly interfere with the paralyzing, the spread of the paralyzing viruses. And this was another magnificent study which Harry Felgren never reported in details which I have in one of my lectures to the Royal Society of Health in Britain with the nice chart based on data he supplied me, which provided evidence—and here I used the vaccine from the stocks that the Merck, Sharp and Dome company prepared in 1956 you see. No. In '56 or '57.
Yes. '56. The major stock grew out then. And 400,000 administered there with a sharp break in the epidemic. And then there was Atlanta where type 3 epidemic. So that much of my stocks of vaccine until there was vaccine available in the United States went to fight epidemics. And this was phase one. When epidemics were still occurring and the live virus vaccine from my stocks was used because the public health service had approved those lots as the seed virus at least so we could use it and this was by request. It was organized by the health departments in the area so there were a number of places of epidemics where it was used and it could be shown that it stopped epidemics. It was also used to stop epidemics in Yugoslavia at the time before they had their own vaccine and the big one really came in 1961 when in Japan six companies went, had gone into production before '59 and '60, production of Salk vaccine. Early in 1961 three doses I think. I forget. Of Salk vaccine produced by the Japanese manufacturers went into practically the whole country or at least the children I think up to ten years or thirteen years of age. And, when the summer came one of the most explosive epidemics of polio came nevertheless, you see. And that was a very difficult situation because there was a large group of post-Soviet parties and people who were demonstrating. They organized the mothers. They said look at the polio. Our children are being paralyzed despite this vaccine that they had gotten. We want you to get the vaccine that the Soviets had used on 100,000,000 people last year and on another 100,000,000 people
this year etc. etc. And it became a Soviet matter, a demonstration to use the live virus vaccine. At that time just at the beginning of the summer of '61, there were only two sources of vaccine in the Soviet Union which was manufacturing it on a large scale and the only country that had already gone into production was a company in Belgium. And Belgium could supply only a small amount so that very large amounts were used to stop, try to stop the epidemic in Japan and it was really a remarkable demonstration of how a quick mass vaccination. The Japanese were very well organized was able to stop an epidemic. And then it became a matter of propaganda on the part of the pro-Soviet anti-Japanese government and the Japanese Government. And the Japanese broadcasting company decided to ask me to come over and they took me for one month all over the country not only to study and to talk over TV and radio and at meetings about polio but to convey the impression that it was a vaccine that was developed in the United States, etc. We didn't yet in the United States and interestingly enough it was again the politics of the situation and then the Soviets when for one month there was this terrific news coverage in Japan and so I was invited by the Soviet embassy to go to Moscow after. I went directly from Japan. Well I did. I mean there are many interesting anecdotes and stories connected with this but the point I am driving at that here we were a period about a year after the public health service had accepted it and still there was no polio vaccine. Now, others had begun to go into production and the ice for
Britain and the United States was really broken by the Phiser Company.

You see in the first place the pharmaceutical companies in the United States had everything invested in killed virus vaccine and they weren't about to start on a new vaccine with all perhaps unforeseen things and that is right. You've got to consider the possible unforeseen events despite what happened behind the iron curtain on hundreds of millions. So they weren't very eager to change. And what led them to change actually. The Public Health Service did not help one bit. As a matter of fact I think I don't know why. I don't want to assign motivations but you must remember that the National Foundation for Infantile Paralysis which supported my research over the years had carried on a campaign in the United States that the Salk vaccine, the killed virus vaccine in which they had put in all their efforts was perfect for the United States. You didn't need a vaccine like, a live virus vaccine in the United States. There was no need for a mass vaccination campaign. It may be harmful. It may be dangerous and the public health service was keeping either out of this or was constantly under the impact because the same advisory groups that were working with Basil O'Connor were also working there and while science is dispassionate, scientists always are not dispassionate. So it was really a very critical period and the trustees, the board of trustees of the American Medical Association had earlier I think at the end of 1960 when all of these things were developing, and I was writing editorials too.
Q Oh, yes.

A I was pushing. Because I was alone. I was alone in the United States. I was accused by some of my very good friends of being not only not just a scientist but being a promoter. But there was nobody else. Nobody else. And I speak now with great feeling as I recall those days because I am the kind of scientist who is not happy to say I have done this. Here is the knowledge and if you people are too stupid to use it that is none of my business. That is not me. My feeling is that knowledge that is developed for use for the benefit of the people must be used for the people. And therefore, ultimately, under these various confrontations and pressures that the American Medical Association appointed a separate committee. I wasn't on the committee. To determine whether or not under the conditions existing in the United States there was indeed a desirability or a need for mass vaccination with the oral polio vaccine in order to really eliminate the disease. And not merely to bring it down to where you still had epidemics and you still had some thousands of people although not so many. And so the American Medical Association came into this picture. And the report in June of 1961 of that committee to the Board of Trustees was yes that there was a need for mass campaigns of live polio virus vaccine. But they didn't say how. They didn't say who should do it and where the vaccine was to come from. I do not remember the events but I think it was even before then that John McKeen who was then president of the Phiser Company had called a meeting together which I
remember very vividly with many representatives from around the world because they were an international company to determine whether or not. Because they were not making Salk vaccine. You see all the others had a vested interest. Merck. Merck had also expended several million dollars in research to make a better Salk vaccine, more purified one. Except Lederly wasn't making it you see. But Eli Lilly, Parke Davis, all the others were making it. So Phiser, to make a long story short after long discussions, decided to go ahead to build the new plant to set up the people and with standards, because by that time the public health service was developing standards for production and so on. Should go into operation to make vaccine both for Britain and for the United States. When this recommendation of the public health service came out there was quite a halliballoo. Basil O'Connor was mad as could be. So was Jonas Salk. But actually it was like a prayer sent to heaven. It wouldn't have done a bit of good except that by that time as far as the United States was concerned although other, Wyatt came into the picture later, Phiser was in production in '61. Lederly had already, already gone into production and then it was a question, how is it going to be used. The American Medical Association came out in favor of mass vaccination campaigns. The Public Health Service didn't say a damn thing. Nothing. They were staying out. They weren't about to start a fight with Roosevelt's partner, Basil O'Connor. But the American Medical Association didn't say how it was to be done. Who was to do it.
Q Before you go on, you have told me an interesting story but there are a number of things that the Public Health Service did do. For example Burney in the summer of 1960 had appointed a polio committee. It is true that they didn't take any action in terms of an administrative action on the part of the government to do this.

A A committee to do what. I know about that committee.

Q Alright. That committee was to investigate so to speak.

A They went to the Soviet Union.

Q Yes. They--

A This was all prior to action of an administrative act as to whether or not to approve these strains or not. It had nothing to do with what to use it. You can approve it but if nobody is going to make it then what the hell good is it, you see.

Q Okay.

A So that we again come to the point here of where in this very critical period the American Medical Association played an important role but it still would have been a prayer that goes up to heaven and the manna doesn't come back. And very frankly, I didn't know where it was going to come to because first there was the problem of getting to production. But then how would it get to the people. And in the natural course of events, the Public Health Service takes the responsibility for this sort of thing but they didn't and I am glad now that they didn't because if they had we never would have had a proper mass vaccination campaign.
And for what ultimately happened I shall be and I think the country should be really grateful to a man by the name of Richard Johns, Dick Johns, a pediatrician in Phoenix, Arizona who in 1961, and you have the correspondence I think it is my files.

Q Yes.

A In which he submitted a plan to me that was based on the resolution of the American Medical Association and that would make it possible for the individual units, the county medical societies of the American Medical Association to take the leading role on a volunteer basis to involve the community at large, the media, the local health officer, all sorts of volunteers, get it organized in such a way that it would be really be able to reach in a short time. And he came up with the remarkable concept of the vaccine on Sundays. This was a very important concept. And that was the idea to do it on a day when people were not working and to it during periods when they were free and have it all decentralized in schools and churches and areas which were accessible that people would be able to walk, most of the people, to get the vaccine and have everything on a volunteer basis that the doctors would do it for free. That the other people were used. Everything would be for free. But now the question of the vaccine. And here first Phiser played a most important part because they had vaccine already available by 1961 you see because they had gotten to work and by the end of 1961 and if I am not mistaken, gosh the dates escape me just when, but I think
whether Phoenix started it in December '61 or December '62 I don't remember but that could be checked. Well the point was that Phiser offered the vaccine free for the whole community. But what they did, what this plan of Richard Johns involved, was that--I don't know whether they offered it free or at a very, very low price but at any rate to cover the cost of the vaccine and certain other things, they said that everything would be given without any obligation but those who wanted to contribute 25¢ as they went out—not before they got the vaccine—would be able to contribute 25¢ towards the expenses of the operation and I think to cover the cost of the vaccine. There was no legislation passed to have millions of dollars used to pay. There was no legislation passed of any kind that was entirely a voluntary effort such as I have never seen before. It was to me tremendously stimu--the government played no part such as it played subsequently with millions of dollars of subsidies for the measles vaccine, for the German measles vaccine. It was entirely a voluntary thing. And it worked in a most interesting--it was organized in a beautiful way to show what the native capacity for organization there is because these were some people who had had army experience and by God it was done in army style. They had a headquarters set up. They had a logistics unit set up. There were even helicopters that would carry vaccine to further distance. There was a motor corps set up. It was organized in a magnificent way which I still think can serve as a model. And it was a tremendous success and the concept was to give it to everybody in the United States.
You didn't know who was immune in the adult population, who was not. Never mind whether you had Salk vaccine before or not because the studies at Willowbrook and elsewhere showed that it didn't matter the kinds of antibodies that the usual Salk vaccine could produce would not interfere with multiplication in the intestinal tract. This was evident in the epidemic of Syracuse and in other places in the United States. They didn't have to rely on other sources of information. And therefore the decision was that everybody was to get the vaccine in two to three months on to infinity. So whole families came. And it was on the sugar cubes. Well the whole concept caught on immediately because in the first place the status of county medical societies organized medicine was somewhat you know, in certain circles under suspicion and criticism and this made it. It was a terrific demonstration of the dedication of doctors, and the leading role of doctors. And it wasn't easy because the pediatricians especially were fighting. They said you are taking our livelihood away. They said we depend on administration of vaccines as part of our livelihood and they had to fight. The other group had to fight the pediatricians. And this was an important victory. You see the board of trustees of the American Medical Association didn't spell out how it should be done. It was a voluntary thing and it caught on. It caught on very beautifully. Tucson was next, Cleveland and then it was spread around the country. And it was in that way that ultimately 100 million people were vaccinated in the most extraordinary manifestation of mass vaccination through a
completely voluntary effort. And most of the communities were left with funds of money from these voluntary contributions of 25¢ per person which they used for scholarships and for training personnel for the health services and all sorts of things. I remember an anecdote that I must tell.

Q Go ahead.

A I was invited of course and my family and the children to Phoenix, Arizona to see the second phase because type 1 was given on one Sunday and then a month later or so type 3 was given and so on. And of course there was a lot of coverage, the governor was there and we were going through a high school where ten thousand people had gotten vaccine. For several hours they were marching through the lines beautifully organized. And as the people were going out, we saw one man was sitting there and he was sort of making notes who was putting in some money into the barrel and who was not. So the governor and I were very intrigued. We went over there and said please excuse us but we couldn't help noticing that you are sitting there somewhat as if you are keeping score who was putting in money and who was not. Are you carrying out some kind of study?

He said no. He said I am just making a note of those who are not putting any money in and I will contribute the money for them.

Q That is very touching. It is very touching.

A It was a manifestation of a certain really basic backlog of good will that exists in a large proportion of the American
people, a will to be involved in public service, in service on behalf—and under local leadership, decentralized this way, it achieved an extraordinary effect.

Q Could I ask you something? A great deal of this was done on a very personal basis with you. So for example in New York in tests that were done in Monroe County it essentially comes of your particular relationship to Hillabow who happens to be the state commissioner. In other places it is people who had been trained in Cincinnati, local who were pediatricians and who called you up personally. It was this personal thing that I find extraordinary.

A I would say this is only a small part of it. I would assign the major credit for the initial important step that led to the ultimate really elimination of paralytic strains from the United States except those that were being imported constantly from Mexico and Texas and California with the migrant workers. Hillabow was actually on the committee of the National Foundation. He was acting against the National Foundation. It was the Phoenix experiment. It was what Richard Johns had developed as a working thing that could be observed. And in working closely with the pharmaceutical companies because the pharmaceutical companies then were able to work with other county medical societies because then Lederly entered into the act you see. And I will never forget how it was done in Cleveland for example, the Cleveland Academy and the pharmaceutical companies supplied manpower and training, power that ordinarily really should have been public health service you see. But it
was done for nothing. It was a public service and they worked with the county medical societies. And they got themselves organized so well in Cleveland that on a Sunday when they had a major baseball game, major league baseball game and everybody was going. Nevertheless on that Sunday they got out something like 90 to 95% of the population. About 1.9 million people to get their first dose of vaccine. And the politicians went after this organization of the county medical society. How did you do it. How did you organize yourself to bring out so many people. It was an extraordinary phenomenon and I was often called to different parts of the country to be there while it was done. And I remember an experience in Omaha, Nebraska. It just covered the country. It was an extraordinary phenomenon. And that I think ultimately, with what happened and this was an immediate drop off. No more epidemics after this was done. And the impact of this was very great. Of course while this was going on other countries were doing it too. And other groups were getting into production. In England I think there were two other companies that went into production. In Germany the Bering Berricka (?) begin to produce. And this, after considerable pressure, Germany presented another dramatic situation.

Q Can you tell me about it.

A Because in 1960 East Germany, after a mass campaign completely eliminated. There was no polio. In West Germany thousands of cases continued to occur for a couple of years and because they wouldn't do what East Germany was doing. It
was a Communist vaccine, they held back and they paid with numbers of cases of paralytic polio and finally I think it was in '63 that the Bering Berricka went into work and fortunately it was of interest that Dr. Walter Hennison who came to work with me in 1953 and who appears as one of the co-authors on the first paper on attenuation. It was published in the *Journal of Experimental Medicine*. The Bering Berricka was making the vaccine and Germany, West Germany then carried out a wonderful mass vaccination campaign with very good results. In Italy, Italy had, was one of the first companies, Silavo, an institute of long standing, in Cienna and a beautiful part of Italy. They began in 1959 and by 1960 they already had vaccine. But what happened. There were also five or six companies making Salk vaccine in Italy. And the Ministry of Health came out and padlocked the vaccine. That the live vaccine that was produced by Silavo while the others were being administered. And there was an epidemic with 8,000 cases of paralytic polio in Italy and 4,000 cases. And I remember attending many meetings in Italy and at one time at the Institute d'Superiora Desanite, I didn't mince any words when the front row was filled with the decision makers and public health ministry and so on. I think that was in '61 after certain experiences had been gotten and I would say I very much feel now like Emil Zolaff did when he said Ja quere (?) And I say I say Ja quere those public health authorities that are not taking any steps in the face
of the continuing occurrence of thousands of cases of paralytic polio to begin to use a vaccine that has demonstrated its capacity to put an end to polio. I accuse them of the responsibility for those thousands of cases of paralytic polio. Well, you see I was not a mild, shrinking lily in the background. And what happened.

And finally a socialist minister of health was put into, became a minister in Italy, and they organized a magnificent mass vaccination campaign. Silavo had all the vaccine that had been tested on very well at the Institute d'Superiora Desanite in Italy and they were able again to bring a practically sudden stop to polio. And then Spain did it in 1963. It just spread all over the world. Production then spread around in many countries. Yugoslavia decided to make its own and I don't know. There is a list. Austria made its own. Austria tried to make its own but it didn't work. But at any rate, Austria had mass campaigns and eliminated it and so gradually over the world it was being produced on larger and larger scale. And in countries that were able to do it, polio came under control. But it was not an easy thing. It is full of dramatic situations.

Q Alright. Let's at least go into one of the important dramatic situations that occurs in the fall of I think '61.

A Where?

Q In the United States and in Canada.

A Where?
Q Well, let me.

A You will have to stop this a moment.

Q Dr. Sabin, I think it was the fall of 1961 just as the mass campaign was getting underway in Harris, Texas, there were a number of events. The Canadian government. Is that '62 or--?

A I don't remember any mass campaigns in Harris, Texas.

There might have--

Q Harris County. I am sorry.

A It might have been an epidemic in which. I don't recall that. You will have to refresh my memory on that. I don't know.

Q Well, look--.