Q Dr. Sabin, I would like to backtrack a little today. And what I would like to do is to recreate some of the atmosphere if possible from 1959 on when the work with your oral polio vaccine was already quite well advanced and what I would like to do is to get some of the initial reactions from the National Foundation to the progress in your work, and I would like to first quote a statement on live virus vaccine from the Vaccine Advisory Committee of the National Foundation dated July 7, 1959.

The Vaccine Advisory Committee of the National Foundation met on July 7 to review the latest information on the use as a possible vaccine of the live attenuated polio viruses particularly the ones developed by Dr. Albert Sabin under grants from the National Foundation. Consideration was given by the Committee today to a recently presented at a W.H.O. Panamerican Health organization sponsored conference in Washington and to personal presentations by Dr. Sabin, Dr. John Paul and others.

The Vaccine Advisory Committee reports as follows:
The live attenuated polio viruses developed by Dr. Sabin show great promise as a potential vaccine. Several million persons in various parts of the world have been fed Dr. Sabin's attenuated strains of polio virus with no reported untoward effects to the individuals. These viruses therefore appear to be safe for the persons to whom they are fed.
The capacity of these viruses to produce antibodies is also reported to be good under most conditions but their capacity to prevent paralytic polio while assumed is at present not known. When live attenuated polio virus is given, a mild infection is induced and the virus multiplies and often spreads to other persons. Because of this spread it is essential that the virus remain attenuated and avirulent for human beings. But the evidence on this important point is still incomplete. Moreover, problems of controlling the production of successive batches of live polio viruses for vaccination purposes so that uniform safety and efficacy will be assured are still to be resolved. The Committee therefore believes it would be unwise to embark at this time upon mass vaccinations with live attenuated polio viruses in the United States. It should be noted that responsibility for accepting and licensing vaccines in this country resides in the U.S. Public Health Service. The Committee believes, however, that laboratory studies and field trials should be continued to the extent possible under carefully controlled conditions in the United States and elsewhere to obtain more definitive information. The experiments being done in various parts of the world, chiefly with Sabin's attenuated live viruses have reached the point where it seems to be in the best interest of the people of the United States that a group of American scientists be formed to follow closely and evaluate such work and inform the American people as to when and if such a live virus vaccine should be recommended for general use in this
country. With the approval of its Vaccine Advisory Committee the National Foundation will undertake to establish and support financially such a group of American scientists. In the meantime, the continued use of the Salk vaccine which is established as a safe and effective immunizing agent is imperative if polio epidemics are to be prevented in the immediate future.

I would like your reaction to this statement. Is it a fair statement of the conditions circa July of 1959?

A I think that the statement as of July 1959 is absolutely valid. In your introductory remarks you were incorrect in saying that you would like to review the situation as it obtained beginning 1959 when the use of oral polio virus vaccine was already well advanced. That was incorrect. Nineteen hundred and fifty-nine remained the ultimate year of major field tests carried out almost entirely abroad. And the results, the analysis of large-scale field trials with many, many millions. I don't know somebody says ten million others say fifteen million in the Soviet Union were actually not in--even in the Soviet Union--until the end of December, 1959. And there were no large scale studies in the United States at that time. I would say that the statement you have just read as of July 1959 was very valid, very sound, one with which I myself agreed and as a matter of fact I believe in my publications, 1970 - 59--I also urged constantly that until such time as that is the vaccine can be properly produced and so on--another vaccine--to take the place of
the Salk vaccine which was being used, that the Salk vaccine should be used to the maximum extent for the benefit that it can provide.

The situation however is what happened subsequently. The first country in which the vaccine was actually licensed—and I think we have been through some of this before—was at the end of 1959 in the Soviet Union when both the Advisory Committee to the Ministry of Health and the Academy of Medical Sciences had carefully reviewed the data, the extensive use in the Soviet Union and had decreed as a matter of fact that from that point on beginning January 1st or so, 1960, the only vaccine to be used in the Soviet Union was to be the vaccine made from the strains I had provided. And as it happened because Professor Chemokov had converted the Institute for Poliomyelitis Research into a quick production facility, he already had millions of vaccine produced, certainly were not tested and monitored in the way subsequent requirements were developed, but he was very much concerned about preventing as many cases of paralytic polio as possible while standards were being set and that was his justification for going ahead very fast because there were approximately 20,000 paralytic cases, just paralytic cases a year in the Soviet Union from 1954 on about and there were also many cases of paralytic poliomyelitis in the allied countries of the Soviet Union, in East Germany and Czechoslovakia Hungary, Bulgaria, Poland and so on. So that with this announcement by the Board—or this decision taken by the Academy of Medical Sciences and the Ministry of Public Health
in the Soviet Union, he went even into higher gear production and as a result of that, before May, 1960, I think oh a hundred and twenty million or so persons in the Soviet Union as well as in the satellite nations had been given all three types of the vaccine produced in Moscow.

In the United States there were as a result of the developments of these field trials, started really for the first time, tests in American cities not on small groups as previous studies had been but on large scale. Cincinnati Ohio was one of them where purposely only school age children a total of 185,000 were vaccinated and then everybody in the area was monitored particularly to see whether the younger children and their families, the parents in the families, particularly the younger ones, and it is to be stressed that there were large numbers without immunity that the total number who had received vaccine, Salk vaccine even in 1962 according to a statement by O'Connors was only 50%. The total. So that this was one of the first large scale community studies. It was also a study in which an extensive organization under my direction with the collaboration of the physicians and the area in all of Hamilton County were set up to study every possible case of central nervous system manifestations that might have occurred in the community during that period. It was an extensive, very tremendous job which I won't go into now. I think we might have discussed it before. It certainly is in print.

Rochester, New York was another one. Well, as a
result of these observations and the effects that were obtained because they were very carefully monitored, and data, new data were gotten under mass conditions, mass administration of the results in the United States itself and then as a result of the reports another international conference of the initial administration of the vaccine 120 million or so people in Eastern Europe. And then I think if I am not mistaken there was also then an international congress in Copenhagen that year. It was a year of a great deal of activity. It became evident that it was necessary for the Public Health Service or the Public Health Service felt it necessary to take the decision on whether or not to license this vaccine for use in the United States.

Well, as I think I indicated before, there were certain problems that had to be overcome. I think it is no secret that the Lederley Company which had invested about it is said to be that they had invested $13 million to develop an attenuated vaccine which was not approved. It was not as attenuated, didn't fulfill the requirements for neurovirulence—behind the scenes was pressuring the surgeon general not to license just one vaccine, the one which I had developed and which had been used so extensively by then in Eastern Europe. And incidentally it wasn't Eastern Europe only. Production had already been started in Belgium and some other countries. So that ultimately I was asked privately over the telephone whether or not if because of the very unpleasant kind of propaganda that the Lederley
Laboratory carried on in previous years, whether or not I would give them the strains for production of vaccine if only these were licensed as well as to anybody else. And I said of course. These strains belong to everybody. So then I think it was in August, 1960, that the Surgeon General released the statement that the United States. We have the exact wording of it here somewhere. You can find it. Has approved the three strains that I had developed for use in the United States.

Q  Now, Dr. Sabin, the three strains were not licensed at one time.

A  Wait a minute. Excuse me for interrupting.

Q  That's alright.

A  You have to draw a distinction of approval for use and licensing a production by manufacturer. You see. Because the first step was to these strains for use in the United States which meant that if a manufacturer could be found to make them and if he would produce the vaccine in the way that fulfilled the requirements, the rigid standards that were being developed at the time because there were no standards yet developed, that then the product would be licensed if it fulfilled the requirements. So the first step was approved. Approval because nobody would make it if it was not approved. So that approval was the first step and that happened in August, 1960.

But what happened after that was, about production. Now the Lederley Laboratories got underway, but not very fast and not on a very large scale. But no one else was getting
underway. Now what was happening in the United States in the meantime in 1960 was, that although the use of Salk vaccine for about six years or so had certainly reduced to a considerable extent the number of paralytic cases, there continued to occur epidemics in the United States. And in cities in which there was extensive vaccination. The most striking one was in Syracuse, New York and another one in Atlanta. There were outbreaks around the country and it was then you see that the health authorities in the state would come to me because I still had large quantities of the original lot from which the field trials were made and these then were used in the United States, the original material that I had prepared for this in groups of 300,000, 400,000, so that by 1960 during the summer in the face of epidemics, there was further very extensive use of this vaccine. But there was still no vaccine available. And as a matter of fact because I don't know, I think it was clear that the National Foundation while it supported it financially was not very enthusiastic to have the Salk vaccine replaced. The statements became stronger later on. So that there was not any special incentive for a pharmaceutical company to get into production and to take certain chances either of actual use or potential unexpected side effects or with a totally new kind of vaccine because it wasn't just another kind of vaccine the way the Salk vaccine used where you take something, you add formulent to it and go ahead although that caused trouble
too. You are not unaware of the fact of what happened the first year after the production of the Salk vaccine. So actually somebody had to break the ice other than even, even the Lederley Laboratory didn't start off right away because there must have been many meetings inside the business, executive group before they would decide to go ahead. But actually the first one to break the ice. Oh, I remember there were so many conferences, was the Chairman of the Phiser Company. They had their medical directors and others making studies. And they decided after discussions with the American government to build a new plant for production of the vaccine in England. And they would make enough vaccine for use in the United Kingdom and other parts of the world in Britain and also for the United States. And that broke the ice. Really. I think his name was John McKeen as I recall.

Q You are right.

A If I am not mistaken. I will never forget. It was a very dramatic decision. So that actually production was just begun in 1961 about the middle of 1961. I think—I am not sure that it was even begun because they had to build—they had to put up new buildings. And in the meantime special—there were any number of meetings in the Bureau of Biologics as it was called then of setting down specific requirements because I had myself of course, had listed specific requirements but there were formal things, and all kinds of rigid controls and constant discussions so that finally the manufacturers had some guidelines of what it is they had to fulfill, what kind of standards, very
specific requirements. How to grow the virus, how to test the virus, how to do neurovirulence tests, the kind of tests that would have to be fulfilled, how they would have give it to the thousand first, you know, before something was licensed, it was not merely a question of fulfilling animal tests, they had to show that the product they made was effective in the field, would not cause any harm in the field, would produce the proper immunogenic effect in the field and not only that, they had to show that they could do it successively. Make successive lots, all of which would fulfill the requirements. Because if one of them didn't, if something went wrong, they would have to start from scratch. So it was a very large thing. It wasn't that the vaccine was there to use. It was as your initial statement might have suggested. Well, it was all ready in '59. It wasn't. As a matter of fact, there wasn't any. As a matter of fact, in 1961, again we had epidemics. And again the only vaccine we had available in the United States was the vaccine that was used for field tests. This was approved by the Public Health Service for use in the face of epidemics because it already had extensive tests around the world, so that by 1961, for example, with the huge epidemic occurring in Japan, that, I think we went into that before with very dramatic situations particularly because the epidemic came after six Salk vaccine manufacturers in Japan had made enough vaccine to vaccinate the children, had been administered during the cold months, a year in the spring, and then come June, July and a huge epidemic. And then there was a screaming
demand for oral polio vaccine because by 1961 you see there were already reports from the Soviet Union, from East Germany, from Czechoslovakia of immediate elimination of polio in large areas.

Q So, you would say that one of the impetuses toward the use of oral polio vaccine were continuing epidemics in the place of Salk vaccination.

A In the United States.

Q In the United States.

A Certainly. Certainly. And I think the statement subsequently made by Mr. Basil O'Connor of the National Foundation in releases were completely misleading and contrary to the facts. Well, before I go into that, however, I would like to say something else that happened in 1961. Because on the one hand the National Foundation was conducting a campaign partly in the press and partly not in the press of, that there wasn't really any--oh, sure, we supported it and it should be licensed because the Surgeon General says it should be licensed but then there was a confidential report I see that went out which was really horrible. I mean it just came to me--shut it off a moment.

See, now we are talking about licensure. In 1961 it was approved. Now it was getting close to the line of licensing, and I am reading here from a confidential memo you brought to my attention from the National Foundation fund which says:
It has been stated that the Surgeon General, and this presumably was 1961, of the United States Public Health Service has said on more than one occasion that he was under great pressure to license the live virus polio vaccine. No one wants to believe this. The Surgeon General's duty is not to two or three scientists who are interested in a live virus polio vaccine nor to two or three manufacturers who may wish to manufacture a live polio virus vaccine. His duty is to the 180,000,000 American people. If the Surgeon General was under any such pressure and did license a live virus polio vaccine because of that pressure, then, regardless of the nature of the pressure the situation could be described only as corrupt.

This is a confidential memo. National Foundation. Well, then it goes on. There is much more of it and if you want to use more of it you can. But what is the kind of pressure, really? It wasn't pressure from the two or three scientists. It certainly wasn't pressure from the manufacturers who were still in the process of having just started, you see. So where did the pressure come from? I will tell you where the pressure came from. Because this is not in there.

You see, the issue was under discussion as to whether or not a licensed live oral polio vaccine should be used on a mass scale for all regardless of whether or not they have had Salk vaccine before, chiefly because a certain proportion of those who did receive Salk vaccine, polio continued to occur. About 20 to 30 percent of all the paralytic cases that occurred during the years of use of polio vaccine were
occurring in those that had received three doses of Salk vaccine—three or more doses of Salk vaccine. So it was obvious that there was a considerable portion that was not protected, and this can be found in letters later on that you will find in the Public Health Service people. So that and the other reasons for the need that was considered by many for a mass vaccination with oral polio vaccine that it was known. It had been demonstrated by many experiments that those who had received Salk vaccine and were themselves protected nevertheless had multiplication of the virus in their intestinal tract and they were able to spread it to those who were not protected. This was basically the basis of outbreaks in cities like Syracuse, in New York, where there was extensive multiplication. So that, and since it had also been demonstrated in studies on human beings that after the administration of the attenuated live oral polio vaccine there developed a resistance in the intestinal tract and that therefore one could expect that mass vaccination would break the chain, that it was considered that in a mass vaccination attempt to quickly break the chain of transmission, one should give it to everyone, not just to those who haven't had any Salk vaccine, but regardless of whether they have had it or not. Well, this drew the ire of Mr. Basil O'Connor. And of course Dr. Salk. To the extent that finally the American Medical Association appointed a committee of its own, an advisory committee of its own and not necessarily the same inside group that was the advisory committee of the National Foundation because this was definitely
a group under the tremendous influence of Basil O'Connor who is, if anything, a very strong personality. And you know you can always find certain reasons to make the boss happy. And if somebody doesn't make him happy, he is replaced by somebody else. Maybe I should apologize for this last statement. So the National Foundation appointed its own committee to advise the Board of Trustees of the American Medical Association whether or not it favored mass vaccination of oral polio vaccine when it becomes available, and is licensed for everybody in the United States. Well, this committee brought in a report, a unanimous report that this should be done. And at the annual meeting in June, 1961, the Board of Trustees of the American Medical Association gave out its recommendation, voted on it, and said that the American Medical Association recommends that there should be mass vaccination in the United States of everybody with oral polio vaccine as it becomes available. There wasn't any at the time, you see, June, '61, there was no American made vaccine. Well, this really blew the lid off. I happened to have been in Brazil at the time arranging for mass vaccination in the Rio, in the state, in Rio de Janero and San Paulo when the news came that this was the recommendation of the American Medical Association. Brazil didn't wait for recommendations of the American Medical Association, but on the basis of what had happened in other countries and the reports—not Brazil as a nation—but in these two states: the state of Monte Bauro (?) with Rio de Janero in it and the state of San Paulo.
So that I was in Brazil when this happened and this came across the news and also the fact that Mr. Basil O'Connor and Dr. Salk were making the most violent statements against this recommendation of the American Medical Association.

The Public Health Service sort of felt as if it were caught in between. On the one hand the National Foundation with the influence that they were exerting on public health officers, state health officers, etc., and the American Medical Association.

Q Did you know that the Medical Association was making this study?

A No. I didn't know. I didn't know that they had a committee. I mean all this was done by themselves, gathering information that was available to everybody. I wasn't a member of that committee at all. I never even testified before it. It was a completely independent report. This is very critical in the light of what happened.

So after this report came out, at that time there was still no licensed vaccine produced either by Lederley or by Pfizer. There wasn't any. So that there remained--but with this statement now from the American Medical Association--they went into high gear production. And within a few months, you see, there was material--and that is where the pressure began to come on the Public Health Service. The American Medical Association of the United States based on a careful study of its own committee has made this recommendation that this should be done. Where is the vaccine to do what the American Medical Association has said to do? There wasn't any. So if there was
any pressure on the Surgeon General, it didn't come from two or
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three scientists who were interested or from manufacturers as
this grossly misleading confidential memo within the national
foundation for infantile paralysis—which despite all the good
things it has done is a very unsavory end to a wonderful chapter
of activity—that this is grossly misleading. It did not say
that the pressure was coming from the american medical association
of the united states. Alright, so the pressure was there.
There is no question about it. And as a result of that, vaccine
was beginning to become available, but nothing whatever would
have come out of this recommendation of the board of trustees
of the american medical association if somebody hadn't picked
up the ball. Because the resolution of the board of trustees
of the american medical association was like a prayer that goes
up and then nothing comes down again. So that is why, and I
think I have stated it before. You probably have it—that it
was the genius of a backwoods, and I say that with affection
and not in any sort of way to throw a bad light on this—of
Dr.--hold it a moment.

It was this extraordinary scheme that was thought up
by Dr. Johns--Richard Johns of Phoenix, Arizona—as conservative
a member of the American Medical Association in pediatrics.
He came up with a plan of how to do it. How to put the
resolution into operation and to do it in an American way.
Not the way it was done in Russia, not the way it was done in
Czechoslovakia in which the socialized public health service
would get together everybody in a certain age group, would go
around and give it. It had to be given in a very special way
and to do it quickly. Because part of the whole concept of mass immunization to stop circulation of polio virus was not to drag it out over five years the way the Public Health Service, Center for Disease Control had still done with measles subsequently and with other things. But to do it quickly, at once, that's the way you've got to do it. Well, he developed the idea, and he wrote to me at the end of 1961. I thought well, it would be wonderful but frankly I told him—and I don't know whether he ever found this correspondence—I told him I didn't think it would ever work—that he could get the cooperation that he envisioned. He said let me try. And he did. And it was in December of 1961 that with vaccine produced by the Pfizer Company that the first mass vaccinations were carried out first in Phoenix, Arizona, then in Tucson, Arizona. Who would ever think that such a thing would start in Arizona, of all places. But it worked so remarkably well and created such a tremendous feeling of community cooperation for a good cause, that the physicians did things for nothing—everybody volunteered—the physicians, the county medical societies, they got themselves organized in almost a military fashion with volunteers from the community, with the press, with the local health officers. It was the most extraordinary organization that I have ever seen. And it worked. And it caught on. And it caught on to such an extent that county medical societies everywhere around the country were getting organized, and it was just a question of getting enough vaccine to do it, and that is why actually, things didn't get
going until almost the summer of 1962. And this again you see, '62 is again upon us and there is still more cases.

Q I don't want to interrupt you, Dr. Sabin, but there is at least one voice, and quite a powerful voice from the community of virologists who opposed mass immunization, and that was David Bodien. David Bodien wrote an article in Science in September of 1961 which I would like to summarize now.

A Look, you summarize it. I know it very well. You make a little note. Read from David and let's not spend time--I know it very well.

Q Alright, I will read from David Bodien.

A But what particular point--

Q I wanted you to make comment.

A Well the comment is that what he said was not valid and ultimately didn't bear weight. The decision went against it. And it is nothing new that at a time of critical decisions, there are differences of opinion. David Bodien was the voice of Basil O'Connor.

Q [questioning that statement] Umm.

A Yes. David Bodien was the voice. I don't want to go into this. But he was the one who provided the arguments of Basil O'Connor. I disagreed with David Bodien on many things--others also. David Bodien's material was available to the committee of the American Medical Association, you see. They voted against it. So what is the point of going into the details.

Q Alright.
The arguments that were made were not valid.

Q Dr. Sabin, just for--

A I am sure that there were others, that David Bodien was not alone. There were other persons, and when I look at the thing now, you see, many years later, some billions of doses of vaccine later with immunization of perhaps a billion persons in the world, I am even amazed that there were not stronger differences of opinion because this was not only a live polio virus vaccine. It was a vaccine that was different from any other live vaccine that was used before. In what way? What were the other live vaccines in human practice and animals? Of course we had small pox a long time. Smallpox was not really smallpox itself. It was a related one, and with the except of situations of eczema or other things, it didn't spread to others. It was given to the individual. The individual who was vaccinated had it. Period. Yellow fever. Yellow fever was given by injection, the purpose being to get antibody development because with yellow fever for example, killed virus vaccine just didn't do anything. So there was no alternative, and that was given by injection and it didn't spread. See, there was not enough virus in the blood so that if a mosquito would feed on a vaccinated person, let's say in a country where mosquitoes were present, that were disseminating yellow fever, that a mosquito could pick up the virus and spread it to others. No. So this was not only an attenuated polio--an attenuated live virus vaccine, but it was one that merely replaced the virulent
viruses and it multiplied extensively. It was given at the portal of entry. Now the portal of entry for smallpox is not the surface of the skin. The portal of entry for yellow fever. Alright it is a mosquito bite which gets the virus into the blood. But it was not open. It was not the enteric tract. It was not the respiratory tract. Here it was given exactly where the virus comes in. And it multiplied extensively. As a matter of fact, in choosing the proper strains it was necessary to choose strains that would multiply extensively because if they didn't multiply the immunity was not good enough. It might have produced antibody, but the resistance to reinfection was not good enough. So all that was necessary. And it was new. Because it would spread to others. It immunized not only the individual who received it, but he could transmit it certainly within a family situation with very young children because it spread like natural polio spread. Only it was another kind of virus. So that it presented new problems. The problem was could you be sure that the virus would not change under those conditions in such a way to become virulent again. It didn't present a bigger danger than the polio itself which was already there. We already had virulent polio virus still all around us. The use of Salk vaccine, five, six years didn't prevent outbreaks of epidemics. So that it was a totally new departure and personally I am really not at all surprised that the issues that were raised were raised. They had to be raised. They had to be
faced. But the question that was asked was it worth. Could you find out in any way except by doing it. Why did we do the Cincinnati experiment the way we did in 1960? For this very reason. Because the question was asked never mind Russia; never mind Czechoslovakia; never mind Mexico; never mind Singapore, wherever the things we had--

Q Yes.

A What would happen in American communities. So it was in an American community--and I remember the discussions I had with the people from the board of health and with the people in the Academy in Cincinnati, and so on. And with the Board of Education finally, that the vaccine was given to the school children. And we knew that it multiplied in them because I worked with physicians and we got stool specimens from all those children. We knew how it multiplied, how extensively it did. And we knew how it multiplied regardless of whether they had Salk vaccine. We had the records. We had the information. We had the data and then we watched because there were thousands and thousands of babies, and there were thousands and thousands of fathers and mothers who had no immunity, that these children. It was vaccinating. It was spreading to them. We knew that it was spreading because we tested the blood. So that this was an experiment to find out whether or not when you vaccinated 185,000 school age children in whom the virus would multiply, would it spread to the other members of the family. And the answer was yes it spread, but it produced immunity, but it didn't produce any harm. Sure we had--the kind of foul up we had in Cincinnati that year was
never carried out. It could have happened quite differently. It just so happened that that summer, three people developed the Guilliam Barré syndrome and died. It could have happened that it could have been in a family where one of the children were vaccinated or somebody in close contact—but it wasn't—and they died. And it was possible to prove that it wasn't polio. And we were there to do the autopsies.

Q Now, just for the record, Dr. Sabin, the Surgeon General licensed--

A Yes. Stop it a moment.

It was done in 1960, and this was part of the information that undoubtedly had a great influence on the American Medical Association committee because there were not only these extensive data from other countries, but here was large scale studies within the United States.

Q Now, the only thing I wanted to get on record is that the Surgeon General licensed the vaccine itself at three different times. Type 1, August 17, 1961. Type 2, August 10, [October 10,] 1961. And Type 3, March 27, 1962.

A Wait a minute. Give me those dates again.

Q August 17, 1961.

A August 17, '61. Okay.

Q October 10, 1961.

A Yes.

Q And Type 3, March 27, 1962.

A Yes. Now, the Type 1 and Type 2 were then licensed
prior to the first mass campaign in Phoenix and Tucson. Now, the vaccine that was used. The type 3 vaccine that was used in Phoenix and Tucson was vaccine that the manufacturer had produced but not yet licensed. And since there was a requirement that before licensure, vaccine had to be used on large numbers of children, especially who were shown by tests not to have antibodies, this was done seriatum and a large amount of information was obtained in those initial, in those initial files. Because subsequently in order to get licensure they had to go into different communities and get hundreds of children that were negative, that had no antibody at all, and to show that there would be conversion. So go ahead.

Q This is one of the things I wanted to put down on the record. Now, there was great community campaigns in 1962, particularly in the late spring and summer.

A Let me comment on this if I may and then we will go on. I hope it doesn't break your thought.

Q No, no, it doesn't.

A You see, the initial Arizona mass immunization campaign did not really come to an end until April because I think the first dose was given in January and then another one six weeks later and the first trial was given type 1 and then type 3, then type 2. That is the way it was done. And that had gotten a tremendous lot of national attention. And then in many other communities--so that by the time this had come into, had been completed, and the other county medical societies were getting themselves organized. I remember that Cleveland was one that came along that fast. Summer was already upon us. Give me
that date again for the licensure of Type 3.

Q March 27, 1962.

A You see. So that there was no vaccine, no licensed vaccine available for mass use of all three types until March 27, and again, the quantity. So that while from a general point of view to avoid the concurrent paralytic paralysis that occurs as the summer months come along, although it always would be preferable to start in November, and December and be all finished by April and May, the communities were going ahead during the summertime in the face of developing outbreaks. And they knew they were doing that because what was the alternative? The alternative was that what happened the year before, namely, outbreaks began and then they would have to immunize in the face of an epidemic. So the programs went on. Many of them started in March and April, May and June and they went on. And by then there were many communities involved.

Q Yes. Good. Now, one of the--I was just going to lead into the point that in late August. No. In early September of 1962, that there came a report from Canada that there were several cases--what?

A Four.

Q Four. Four cases of polio that were thought to be vaccine associated cases. And this began a furor in the Public Health--

A Naturally.

Q Service. Now, one of the things that I am going to do is I am going to change the tape and at this point-- END OF TAPE