Q To continue, Dr. Sabin.

A Alright, as I said, that some of the clinical concepts of the variations in the spectrum that might be called that are atypical, grew up during the period when it was assumed that all cases that occurred during an epidemic were caused by polio. That if you had an epidemic of polio virus that everything that had clinical manifestations, typical, atypical it was caused by polio. Well, of course, actual studies have shown that that is not true. That during an epidemic of poliomyelitis you can have other viruses also active. You can have other conditions and as a matter of fact, this was brought out most strikingly in a study which my former associate, Dr. Romulus Alvarez carried out over a period of five years at Children's Hospital in Mexico City and in which I subsequently collaborated with him in a pathological study of the material. I think it is important to put this one on the record.

Maybe I did it before but it can be--

Q No, you did it before.

A What he did in Mexico City in a situation in which paralytic polio continued to occur, vaccine was used very irregularly. And so at the Children's Hospital in Mexico City where he was working, they tried to get autopsies on every child that was administered to the hospital with flaccid paralytic polio either of the hip or the extremities or the cranial nerves or bulbar polio. And over a period of five years fifty such autopsies were conducted.
Dr. Romulus Alvarez carried out in addition to the regular neural pathological studies that were carried out by the pathology department, he obtained tissues for isolation of virus. He studied the contents of the colon, looked for virus elsewhere, different kinds of viruses. And a very interesting thing came out. The results were published. I was one of the authors on this, the Journal of the American Medical Association. I think sometime in the late sixties. Late sixties because it was long after this (referring to 1964 study by Public Health Service?) appeared.

And the interesting thing was and I don't have the exact figures. You can get them from the publications. That out of about 50 fatal cases that were studied this way, only 25 on pathological examination turned out to be poliomyelitis and the others were non-inflammatory conditions of the central nervous system. And what were they. Very important lessons were learned from that. Among the 25 without inflammatory disease of the central nervous system, even though clinically they had flaccid paralysis which led to death, usually a respiratory death, there were ten that fitted pathologically what is called Guillam Barre syndrome: descending paralysis, increased protein in the cerebral spinal fluid, and pathologically lesions in the roots of--peripheral roots rather than in the neurons, the cell bodies in the spinal cord itself or in the cranial nucleii. It was pretty typical Guillam Barre. But that left fifteen other fatal cases which did not have the clinical manifestations of Guillam Barre and they fell into
two quite new categories from the neuropathological point of view. One of them I recognized as a condition unknown, whatever the factor was, it is important one day to find out. That I called sitoplasmic neuroopathy.

By that I meant that the ordinary structure of the sitoplasm's initial substance in it was affected of the anterior horn cells or the nerve cells for the cranial nerves in such a way that it was practically wiped out. And in the early deaths this happened without changes in the peripheral nerves at all. In another group. I think there were ten in one and five in the other, the sitoplasm was perfectly alright. But the nucleii in these nerve cells had undergone a degeneration and because I used the so-called Bodein silver stain to look for changes in the axis cylinder cells, I discovered by accident that the degenerated material had a special affinity for silver and it was easy to spot every degenerated neuron because there was a black blob. The nucleus was a black blob. The nucleus was a black blob. Now the interesting thing is that these cases had no increase in cells in the cerebral spinal fluid. Why? Because it is not an inflammatory condition. Why do you get cells in the cerebral spinal fluid in polio? Because it is an inflammatory condition and you get accumulation of cells in the perivascular spaces of the blood vessels and those cells spill over into the cerebral spinal fluid. So that when you do a lumbar puncture within certainly seven or ten days after onset of paralysis, you find an increase in cells. It is called cleositis. And this was certainly
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the case in each case where pathologically in this study it was polio. However, in those who didn't have the inflammatory condition, they didn't have. So when there were reports for example that during a certain outbreak of disease in Baltimore or somewhere else, ten percent of the patients didn't have any cleositosis, didn't have any increase in cells in the cerebral spinal fluid to make the statement that this represented polio, that didn't have an increase in incorrect. Because here also you see without having a pathological examination you can't say. Let me give you another example.

In one of these patients, 25 patients, that had either Guillam Barre or these two new neuropathological syndromes there was a Type 1 polio virus in the stool, not a vaccinated child. She was dead. You expect to find it. One in 25. It had nothing to do with the septilary system disease which is another manifestation of what one is ready to accept on general theoretical grounds that the mere presence of a virus in the stools of the patients, whether vaccinated or not,

Q As indication

Q Does not provide evidence that that central nervous system disease was caused by that virus. So that what we come up with now is this: particularly after that study personally I would say that when you have a paralytic disease however typical it is, because these others, which I described in the children, they didn't have any sensory signs, or anesthesia,
areas of anesthesia. They were typical, flaccid paralysis, and you have no increase in the cells of cerebral spinal fluid they are something else. You can at least say that 99.9 percent chance. As a matter of fact on the basis of other things Bodein himself quoted in a letter, out of Cecil's textbook that cleositosis is the rule of poliomyelitis and that that—its Dr. Weinstein of Boston said, that in one out of 200 cases of paralytic polio you may not get one out of 200 cases. This is without evidence, without actual tests to show that those were actually caused by polio virus. Now mind you during an epidemic you could find some without increase in cerebral spinal fluid, cells in the cerebral—and you can isolate the virus from the stool—as happened in a case that we studied postmortem in Mexico. So this is one of the reasons that things, concepts have arisen which gave rise you see to this variation.

Q Now there are a number of things that I don't understand. For instance, was there any kind of test that existed in 1962 where you could say you can differentiate a Type 3 wild virus from a Type 3 vaccine virus.

A Well you see there were studies carried out subsequently in which antigenic differences. Because if it's Type 3, Type 3 is demonstrated. But studies that were carried out show that particularly with Type 3 it is less than Type 1 and Type 2. That in the first place, you can prepare a serum which would react with the vaccine strain, would absorb it, it would not react with the so-called wild virus. But what, to the credit
of the Center for Disease Control was done was to go back to the bank of viruses that had been isolated, polio viruses in the United States, before any attenuated polio virus vaccine was tested, or it was introduced. And by using this test for Type 3 they found that something like 40 to 50 percent of the wild viruses had the same antigenic constitution as the vaccine. To say that you have a vaccine like virus (A) does not eliminate that it is a wild polio virus for Type 3 especially and moreover, you expect the vaccine like virus to be there. You expect the virus to be vaccine-like because as I said, you take one thousand people who have had the vaccine and then a drink of water, you would isolate virus and it would be vaccine-like, antigenic. But, there is a test that you can do and it was done. You can test for increase in virulence because the whole concept that there may be a risk of one in a million or one in five million, one in six million is that occasionally, rarely, virus may change as we know it does change in virulence and that there may be selected out of that population of virulent virus particles in one out of a million, and that it then this more virulent virus produces disease. That would be the explanation. But they paid no attention to the tests. This is 1962. I had to get those data from the Bureau of Biologics and I think show data there on five Type 3's that were isolated from suspect cases that were tested in the brain of--I inoculated something like a million tissue culture infective doses of monkeys and they were not neural virulent. So that the assumption that this
perhaps should be expected because occasionally the virus conceivably, some portion of it could be changed and it would be selective. There is no evidence for that. So that, and you know, this happened not only in the United States because in the surveyance later that the World Health Organization has been carrying on, still is carrying on, there have been some of the most peculiar results. The results from Rumania or Poland have come in, sometimes Hungary, would be totally different than the results from Japan, or England or the United Kingdom or Germany, and just at the last meeting, October, 1976, I went over a report from Rumania. Something very peculiar. It turned out that most of them had no cleositosis and I mean this thing came up again and again. At one time there was a question on Hungary and they thought the Russians were making bad Type 3 vaccine. I don't know. The usual criteria for monitoring vaccine production which are followed in other countries are not always followed in the Soviet Union and frankly we've not been able to get all the information we need. The, on the basis of all of these things now if I take the picture in February 1977, I would say that there are people who say that you cannot rule out the possibility that in a very rare individual and let's not consider now those with genetic disturbances in immunity although I have analyzed that also and I have found no basis for a role there. That there may not be a rare instance in which something can happen as a result of that but it is so rare that we can end up with a
situation where year after year in the United States we have only four or five cases in the whole country, and I wouldn't think that those four or five are really polio cases because there is not all of four or five are associated with vaccine incidentally. So that a committee, the W.H.O. committee of which I not a member that met in general, an international committee in Geneva came out with a statement that oral polio vaccine is one of the most effective and safest vaccine that is available for use in human beings.

Q When you talk to a layman and you say there is a committee of scientists you expect a kind of consensus of opinion on high and the notion is that scientists are so objective that the world doesn't touch them. Are scientists this objective, does the world--

A I think that one must understand a little better when one can be objective and when one must guess. Certain things one can be objective about. But there are other situations when one has to deal with probabilities, and there will be differences of opinion. For example, this stress on epidemiologic indications or suggestions. Well, many will discard it altogether and say you can't do that when you have such a low, such a huge denominator and such a small, tiny numerator. So basically what you are involved is not dealing with an objective determination is this Type 1 or is this Type 2 polio. About this you can be objective. Or is this five grams or is it ten grams. It is five grams. You can be objective. But when you have to
make a value judgment or a probability judgment. Is it possible; is it likely. Just like with the influenza, swine influenza scare. The president was given a thing to read that there is a real possibility that we will have a severe influenza, swine influenza epidemic in the United States. What's a real possibility. There people differed. And the ones who said no at a certain time this is not behaving like an epidemic virus. They were already able to say that in May, June, July. Were expressing a judgment that ultimately proved to be correct. So what is the correlary of it in other fields of human judgment. Well I often think of the Supreme Court of the United States that has material presented to them. Certain things are accepted as facts but then once you have the facts, the issue is not decided just on the facts. It is decided on the interpretation. And what does it mean. And you have nine supreme court justices and how rarely is there a unanimous decision. They are presented with exactly the same information. And this is what obtains also in committees of scientists who have to weigh not objective facts that you make a, can get something without a doubt but you have to weigh probabilities. It is when you weigh probabilities the differences of opinion come in. And you will have scientist's testify on the one hand it could be this and on the other hand it could be that. And this is very confusing to a senator like Senator Muskie who said "I wish I had some one-handed scientists come to testify before me." Which he means, let them make a decision for themselves.
Q  But aren't your interests as much on the line in '62 as let us say the public health service's interests?

A  If one says that I was biased one has to challenge the data that I present. For example, if I would say that out of 22 suspect cases among 30 some odd million persons who received Type 3 vaccine there is only one woman and 21 men. If I am wrong on this then I misrepresent it. But if it is true then you have got to face the fact that one woman, one who had four doses of Salk vaccine only is involved in this situation which is an abnormal situation. That is a fact. And therefore all the bias in the world that I may have--and to say that I am not interested in finding out whether this may happen--after all of the work that I did, knocking myself out, studying these things first in monkeys and chimpanzees to see whether it happened and then among volunteers in prisons and then in Cincinnati when we carried out--of course I am interested. But the point is that there is a tendency on the part of some to be careless. The assumption just because a person has had scientific training that he is careful is very well illustrated by the totally irresponsible report that was made to the Public Health Service by this man who evaluated the data in Nebraska which John Fox challenged. So that one either has to say that what I bring up is a value judgment based on bias or one challenges the data. When I say that if you make a statement that there is a greater risk for those 18 years and older and then I show that in 1964
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after 20 some odd or thirty million. I forget what I just said. That two suspect cases that occur are not over 18, that they are now babies, that it is a matter of chance entirely how it falls. When you are dealing with such a rare event. Now that is not bias. Either that is so or is not. So that the real issue is logic. Is the logic used, what I am challenging in my reports that were published concurrently, where I disagreed with the overall committee judgment. What I am challenging is the logic that was used, you see. So I am charged with bias and it is for that reason that when court cases came up and so on, I refused. Only once did I break this thing because it was a federal case and I was asked by the U.S. government to come and testify. Because I realized that in the public mind and in anybody else's mind they would just assume that I am biased and no matter what I said would carry no weight. And basically, ultimately, what, the complete elimination of Salk vaccine from use in the United States that took place since 1965, '66. Certainly in the past ten or eleven years. I didn't make that decision. The doctors made that decision. So that ultimately logic and time influences the course of events. I was challenging the logic of the committee, that they had a responsibility to be very careful. I did not disagree with for a moment. But the interpretation and the misleading statements such as John Fox challenged the analysis for example in Nebraska. That type thing was irresponsible.
Q But you can still hear that there is something wrong with the Type 3. It is still part of--

A Yes but that is wrong. Because it is not so. There is nothing more wrong with Type 3 than there is with Type 2 or Type 1. And now on the basis of other things they said well it isn't Type 3. The problem again maybe one in millions and millions, but when a paralytic case whether it is really polio or not is another matter. It has occurred on a number of occasions in the parent of an infant. But it wasn't Type 3. It turned out to be Type 2. But this thing has been handed down from '62 to '64 and it is wrong. It is wrong because time showed that it was wrong.

Q And yet the programs were disrupted for a period of almost two years.

A No they were not.

Q They weren't?

A That is the wrong statement. Because I just pointed out to you that despite all of this, these reports the press coverages in 1962, the debates, let's see how many doses were used in '63 and '64. Turn it off a moment till I--

Q Yes.

A Subsequent to these 1962 debates and where the Public Health Service committee recommended that temporarily there should be a halt for administering Type 3 in the mass vaccination program. Actually, about 59 million doses of Type 1, 54 million doses of Type 2 and 76 million doses of Type 3 were distributed
from January 1, 1963 through May, 1964, and they were used.

Q And this in spite of the recommendations of the
surgeon general.
A Because it started up again.
Q And in spite of the Academy of Pediatrics.
A No the Academy of Pediatrics reversed itself later.

First the Academy of Pediatrics--and I have this interesting
letter from--
Q Corrielle.
A Corrielle to John Paul. The issue is taken as follows.

It was on the basis of Lanier's recommendation that the surgeon
general came out with the following phraseology. This is in
November, 1962. There is sufficient epidemiological evidence
to indicate, and Corrielle underlines to indicate that at
least some of these cases have been caused by the Type 3
vaccine. He says the italics are his. Now our quotation of
a part of that sentence does not change the statement. It
merely emphasizes what was actually said. And they said
sufficient epidemiologic evidence to indicate is not
synonymous with circumstantial evidence suggests. And the
difference is of vital importance to individuals who assume
responsibility for giving this vaccine to their patients and
community. If the facts warrant a milder or qualified
statement, I suspect that the committee on the control of
infectious diseases would go along with the use of the vaccine.
And that is what they finally did. Because what the academy
of Pediatrics finally recommended, after it had been used more
extensively another two, three years is that only oral polio vaccine be used. It was—that was the reason why it was started. Not because I came out and yelled against Salk. What Salk is trying to do now. Salk is taking all the cases that occurred from 1961 in the United States and he says they were caused by the vaccine. And therefore one should return to the use of Salk vaccine. And then all of the people when I brought out the fact, look at how many of these suspect cases have had four or five doses of Salk vaccine, they say that doesn't mean anything. Twenty percent of those getting that much Salk vaccine get paralytic, natural paralytic polio so in 1962 on the one hand there is this statement that 20% of those who have that much Salk vaccine can get paralytic polio with a statement attributed by Basil O'Conner that polio has been eliminated entirely by Salk vaccine. Therefore there is no need to have any community programs. You see one really goes beyond the facts, beyond judgments. There were passions involved. Basil O'Conner felt a proprietary

Q  Now why shouldn't he feel a proprietary interest for you. After all, he supported your research.

A  He didn't support my research. As a matter of fact—there was a way back. I mean these are personal things. He is dead now. If he weren't dead maybe I would ask him, but he was so biased. Look at all the money he used for setting up a special Institute for Biological Research to give Salk a job. There are many people who believe there is no reason for using public money that was given to the National
Foundation to support another institute for biological research. 
Mind you there are some wonderful people who have worked, and 
are working in this Institute that was set up predominantly 
with money from the National Foundation

The fact is that never mind value judgments or why. The thing is that the facts they used were wrong you see. When he said that poliomyelitis was eliminated by Salk vaccine it was not. Epidemics continued to occur. And even in the discussions with the committee you will find these letters. They all say that you must expect 20 to 30 percent of those who had the full course of Salk vaccine to still be susceptible to paralytic polio. Now he is obviously--the other experts who heed this regard now. And of course what Salk is saying and stirring things up all over again now is that look at Sweden and Finland. They have used only inactivated polio vaccine. They have no polio either. And how do you explain that. Yes, how do you explain that. I think you explain it on the basis of the facts that they are small islands in a sea of Europe that has used extensively oral polio virus vaccine all around and the chain of transmission has been broken. In the olden days before polio vaccine, the situation in Sweden was such that when the population was first immunized rather extensively by severe epidemics and they used to have severe epidemics every four or five years, five years could go by without any
of the children picking up virus spontaneously even though it was still being brought in from the rest of Europe and then they would get another huge epidemic because enough susceptibles would brought in. Now, you have Europe surrounding Sweden and Finland or Holland in which oral polio vaccine has been used extensively since 1963, '64. The chain of transmission of paralytic polio viruses has been broken. And they are protected just the same as some of our states where hardly any kids have been vaccinated in recent years, are protected and are not getting any polio. So the thing that we have to look at is not Sweden and Finland, although I want to say something else about Finland.

In 1965 or '66 I think it was. I attended a meeting of the European Association against poliomyelitis and there was a report from Finland on a serologic survey they made of their children. They didn't have any polio you see, they said, see Czechoslovakia for example reported that ever since 1960 when they carried out a mass campaign they haven't had a single case. And in Finland also they said well we haven't had any polio for four or five years. They did a serologic survey and they found that only about 30% of the children one to three years old had antibodies. In other words, it wasn't because there was widespread immunity produced by vaccination. They were just protected. The data that really are of importance, what happened in this country. Sure there was a marked reduction of paralytic cases of polio as a result
of the use of Salk vaccine. But after six, seven years, 62, 63, 61, epidemics were still occurring and the Health officers would come before vaccine was available and say oh, come let us stop the epidemic. And really it used to work very well. The vaccine would be administered, oral polio vaccine as in Syracuse within a few days the epidemic stopped short.

Q One thing I don't understand. I remember reading at one time a report of Svengaard at New York Academy of Medicines where he objected that it was almost impossible to tell that curve of inactivation and yet on the other hand a supporter of--

A I will tell you what they did as a result of that. They never used virulent strains of, that were used in the United States.

Q They never used a Mahoney strain.

A No. They took an attenuated strain. They said, and they said that even if we miss a few particles we still do not run the risk. There was a feeling that they were--there was again, without logic, against live polio virus vaccine. They were also against live measles virus vaccine until terrible accidents occurred in those who were subsequently exposed to measles, although it didn't happen in Sweden, but it happened in the United States and other places so that the killed measles virus vaccine had to be taken off the market because they became sen--they sensatized a certain number of children so that when wild measles virus came along and infected them
they got a much more severe disease. Some of the first cases incidentally were reported from Cincinnati. Alright, now I think there is another point here that—I have forgotten.

Q Yes. Well, my you know. It just was curious.
A Oh yes. I want to make the other point.
Q Okay.
A Because it is in one of my publications that I put out. In the administration of Salk vaccine following the field trials in 1954, beginning 1955, the CDC was very heavily involved. And of course it was a poor program because it reached not enough of the people. Alright the people that it reached—I am not saying that it didn't do any good but it was poor because they could have vaccinated everybody the way they do in Sweden for example, as they never did in this country even O'Conner says that only 50 percent was ever vaccinated by 1962. So the—talk about built in bias—what happened during those years after five years, six years of use of Salk vaccine in the United States there were hundreds of cases that would occur within one month after vaccination with Salk vaccine because among the thousands of cases that still occurred in the United States in '59, '60, '61, there were hundreds that occurred within thirty days. Oh but that is a killed virus vaccine. It can't possibly be responsible for it. So among those there were some that were even worse not only did they occur within thirty days after administration of Salk vaccine but they occurred first in the arm that was inoculated with the vaccine. Eleven cases, ten cases. But
the Public Health Service didn't say that well of course we cannot be sure that this is not caused by the vaccine. They didn't say. They said all evidence points that it is safe, safe, safe, safe. It isn't so. The original statement of Svengaard still holds. It is one thing to say that theoretically that everything should be inactivated and it is one thing to say that it was—that things were changed after the terrible Cutter accident, that filtration, eliminating clumps that might have been protected was the thing—that the Cutter incident was only the huge iceberg that rose up and then it was diminished. That if you keep on giving it to millions of people you pick up some but you won't pick up in ten monkeys or a thousand tissue culture bottles. So the assumption that a killed virus is safe, safe, safe cannot be made. Certainly not when you use those virulent strains. We also, again to show the bias on the part of committee members, after the Cutter incident, when John Enders and I pleaded and we had to appear before Congress because things couldn't be worked out. There was such built-in bias in the National Foundation. And we pleaded that they should change the strains at least and because it was felt that it might be a reflection on the wisdom of the decision they wouldn't change the strains. And they had of course they could select a committee that voted by majority that they shouldn't select the strains. And what was the logic behind that. Well we don't know what would happen with the new strains, that the tests that were carried out, the field
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tests, were carried out with these strains and how do we know that the other strains will produce the same kind of immunity. And now that we are changing the technique it should be all right. You see how there are spheres where it is not a question of objectivity, but a question of judgment that comes in.

Q Wasn't there a question of potency of Salk vaccine?
A Well they also said that it was not potent for Type 3 especially. Not as potent. But you see basically things are being so muddied now in the United States because of these suits that everybody, you tell a mother who comes to get a vaccine shot for the baby, a routine immunization. She has got to sign a paper to say that she had been told about the possible risks of pertussis, polio and measles and so on. How the hell can she make up her mind for God's sake this is the job of the Academy of Pediatrics, the job of the people who can judge and to make the law require the signing of things like that--this is going to greatly interfere with the immunization program. It is for this reason that I think I was invited to, by the women's auxiliary of the AMA to go to San Francisco this coming June and speak on the whole subject of immunization because it is really--it is now being threatened. And you would be surprised in England they have formed a committee which says that pertussis vaccine--and there are some toxic substances in pertussis that has a certain amount of complication. The government is killing our children by giving them pertussis vaccine. If you stop
using pertussis vaccine you are going to get pertussis back again.

Q Now if--

A If you stop using diphtheria toxoid you are going to get epidemics again.

Q The one thing that grabbed me in all of the correspondence are two letters, one from Stuart Harris and the other from Andrew Rhodes. Yes. You don't have them in front of you but were they not--they are surprised at the actions of the surgeon general recommending stopping the giving of Type 3 polio vaccine and they said their programs are continuing. In other words, the furor really didn't touch them.

A Well you see furor is very often manmade and there were interests. I am not saying that one shouldn't have continued surveyance just as the World Health Organization now is continuing surveyance in other countries. But it shouldn't have been done the way it was done because when groups--you see the CDC was guilty of this in 1962 as it has been guilty with giving out to the public irresponsible statements on the swine flu. The statement about the investigation in Nebraska which was an out and out distortion of the findings on a totally irresponsible conclusion given out to the press to confuse the people. So that after a while what happened in '63, and '64 shows a little something of the thing that has happened now. The people just didn't
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pay attention any more to what the Center for Disease Control was saying.

Q Fine. We can stop here.

END OF TAPE