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Place Washington, D.C. 

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EVENING SESSION 

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UNITED STATES DEPARTMENT OF LABOR

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CONFERENCE ON

CRIPPLED CHILDREN'S SERVICES

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Washington, D. C.

April 7, 1938.

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EVENING SESSION, 7:30 P.M.

(Held in Green Room in the Government Auditorium ad-
joining Department of Labor.)

Dr. R. C. Hood, Director, Crippled Children's
Division, presiding.

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Chairman Hood: I told you this afternoon that tonight we would have the real treat of the Conference, and we put off our best part of the Conference until last, to hold you here.

We have two speakers that I am sure will give you some different points of view.

It gives me great pleasure to introduce Dr. J. P. Leake, U. S. Public Health Service, who will speak to us for a while on epidemiology, and early diagnosis and prevention of Poliomyelitis.

STATEMENT OF D. J. P. LEAKE
U. S. Public Health Service.

Dr. Leake: Ladies and gentlemen: Dr. Van Horn told me that we would have twenty minutes to discuss the Epidemiology, diagnosis, and prevention of Poliomyelitis, and I thought, well, perhaps we might just go at it backwards, the practical side, let us speak for just a minute, and then perhaps, as I understand it, there will be time for -- some time during the meeting -- for mutual discussion, and you will be able to tell me a great deal, I am sure, and we will have questions back and forward, possibly.

Epidemiologists, I suppose, are discouraging people, and we study the natural history of disease, just what occurs in nature, you know, while the clinical medicine
is concerned with disease in the individual, and just as clinical medicine aims at cure, so the epidemiologist's desideratum is prevention, and like a good many clinics, they are great on diagnoses, but the treatment isn't always so specific.

You know, many of you, and have had actual experience lately with some of these things. I am sure some of you here have been directly concerned, with some, and perhaps have mentioned them in the discussions yesterday and today, which I greatly regret not having been able to hear, but just to be specific and as brief as possible, we could speak, of course, of prevention in specific measures:

First, let us say "serum" -- and I needn't speak about the foreign attempt, there have been animal serums produced and to some extent used in this country, but largely, of course, the things that have been done, and have been used, have been convalescent serum, and serum from adults, commonly called "pool" serum, for prevention.

Dr. Brebner, you perhaps remember, up in Northern Pennsylvania, used it under Dr. Park's direction, but the results, although they appear in the postscript to that book that the International Committee published on poliomyelitis, they won't stand critical examination, and we haven't any good data, and I may say for my part, any good reason for believing that such serum will prevent polio-
myelitis.

Then, of course, you know the rather sad tale of vaccines. We won't go into that, except perhaps some of you may know of this, that some physicians have written to me, written in the last few months, of cases that received one of those vaccines, and within two years have come down with frank poliomyelitis, so that it was not only dangerous, as you all know, but it did not prevent.

There are various other proposals that are coming now and we mustn't stifle research, but there is no definite promise of hope in that direction.

Now, chemical blockage -- I ought to have mentioned the epidemiology of the disease, why we think that it is spread, and occurs in humans, by the virus on various small particles, reaching the only exposed unprotected part of the central nervous system in the whole human body, namely, the little tentacles of the olfactory nerve, away up in the nose, where it isn't ordinarily reached, and where things don't ordinarily reach except penetrating odors, and that is the only native place in the central nervous system and it seems that that is the most likely, and not the sole, but the most likely portal of entrance of the virus into the human body and Dr. Armstrong, and Dr. Harrison first proposed and succeeded in preventing poliomyelitis in monkeys, our only experimental animal, by using first, alum
-- and then picric acid and alum, one per cent equal parts, mixed, up in that part of the nose, and as you know, it was tried on a great scale down in Alabama, but it was quite obvious right from the start that the negative results would mean nothing, because the way it was used, some of you were down there and saw it, and the front hall and hat rack, there would be an atomizer of this, and everybody that came in the house would get a squirt, but the squirts were so infective that it didn't do any particular good, and I will tell you that if you really get it up in that olfactory area of the nasal mucus that there is quite a little inconvenience, and certainly you know that it is there. It is a very penetrating treatment, and a very delicate place, and you feel it very decidedly.

Then, of course, Dr. Litsky and Dr. Sabin suggested tannic acid, and Dr. Shultz in Leland-Stanford suggested and used on monkeys successfully, zinc sulphate.

Well, it is very astringent and more successful experimentally. Most everyone has found it, and this other thing has been confirmed, both for zinc sulphate and for the picric alum, that it will prevent disease experimentally in monkeys.

It was found, of course, following this Alabama experience, that the ordinary application of an atomiser would not reach the area desired, and consequently a
nozzle was used to reach it, and reach the very part that is necessary, but some of you have seen that used, as I have, and even in older children there is bleeding, quite often, and we think that that is dangerous.

We know definitely, quite definitely, and it has been confirmed, that tenelectomy is a bad thing during poliomyelitis seasons, that people having their tonsils out during that season are decidedly more likely to have poliomyelitis than others, and that isn't the olfactory area, and furthermore, in those vaccine cases, the paralyses that came on from these children that received that vaccine were in the area of the body where it was injected more or less, the first appearance of the paralysis, and the same way with the tonsil cases, that the paralysis followed the nerves more or less in that region, and it seems that the virus of poliomyelitis travels by way of the nerve trunks, as you probably know.

So any denuding of the mucosa, particularly during that poliomyelitis season, we think is a poor plan.

Well, that is out for the present.

I may say, furthermore, which isn't generally known, that the zinc sulphate, in our experience, Dr. Armonstrong's experience, is more irritating than the picro-alum, and in fact used to prevent meningitis, another disease which is transmitted in a similar fashion, but it causes much irritation.
and swelling of the mucosa.

So that, for the present, although there is hope, we can't recommend any of those methods as public health procedures.

I must say, though, that the prevention of poliomyelitis goes farther than that, to me. The prevention of poliomyelitis is concerned with just what you have been working over in concert these last few days, and that is the prevention of the results, and the deformities, and the paralysis from infection with the poliomyelitis virus, and we believe that early attention, and early diagnosis, -- and Dr. Hood and I have spoken about it many times, will do much towards relieving this thing which the bulk of the Children's Bureau has just stated, that poliomyelitis is the most crippling, causes more crippling in children than any other thing.

We used to have more with -- as you probably know -- with tubercular infection, but that, through pasteurization, and so forth, that is very much on the down-grade, and poliomyelitis is our chief thing now.

I think that those of us who have a few more gray hairs or baldness, possibly, than others, realize that there is a tremendous difference in what we see on the streets and the hospitals and everywhere now, from what there used to be just a few years ago. Ever so many less deformities on account of early and better treatment, and that is
what some of these things that you see -- and I hope that you will have a chance to glance at them -- these are to remind us of that.

Let us go back for just a few minutes. I have almost used up the time, on the epidemiology of the disease, how it occurs in nature, the nature of the disease.

There are many things that you can say about them, and perhaps you will bring them out later. It is one thing, -- there is one very striking thing about the disease, it is a disease, so far as we know, exclusively, naturally exclusively, of humans, and it is a virus disease, caused by an infective agent so small that it will pass through all of our ordinary filters, and in fact one of the very smallest of the viruses, but there is no other animal in nature that has the disease, in spite of all that we hear during epidemics of chickens and dogs and cats and horses and so forth being crippled, and we have followed them all up and have for many years, since 1912, I have been concerned with things of that sort, and we inject that material from these paralyzed animals into monkeys, and even if the monkeys aren't paralyzed we put it in other things, and it comes to nothing.

None of the lessons in the animal are typical of poliomyelitis, and you can tell various stories about that, but it will just take up time, and the only experimental
is the monkey of the higher order, and not necessarily apes
and not necessarily chimpanzees or gorillas or orang-utangs
and not our South American monkeys, and they are not susceptible
at all, but only the higher apes.

Now, even this virus that we had so much trouble in
discovering, even that is transmittable to mice, and this
new disease just discovered, syphilitic meningitis, -- and
the French call it the Armstrong Disease, that is much more
generally transmittable to other animals, and also more general-
ly transmitted throughout the human organs, but poliomyelitis
by an large, is entirely a disease of humans, naturally,
and experimentally only, of these higher monkeys,
and generally, the virus is found only in the central ner-
vous system.

It is found in the nasal mucosa, and it has been found
in tonsils once, and it was found occasionally, rarely,
I am not sure but there is only one instance well proven
in the mesenteric level, and it has been found in the
feces occasionally, but generally speaking, in the part of
the central nervous system which is affected, which we all
know, is the spinal cord, that is there is a much more constant
virus there than in the brain, although it is found in the
brain.

That is one thing to bear in mind about the disease, when
we figure on various things about it, and how it can be
spread, and so on.

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Another thing that is of interest about the disease is that there are none of the other common diseases that we keep track of ordinarily, you know, in measles, and scarlet fever, and whooping cough, and smallpox, and so on -- none of our common diseases which vary so much from season to season, in any year, and from year to year with tremendous highs, and years with much fewer cases, than poliomyelitis.

It also varies a great deal from place but not so much as you used to think. It is characteristically described as a disease in the northern hemisphere, of the northern part, and the colder parts of the temperate zone, and that is true.

The United States, and Massachusetts, and New York State and Minnesota, and Montana, and so forth, they have been hard-hit, and in Europe, Scandanavia, and there is no country in Europe, though, that has been as hard-hit as the United States, and perhaps nowhere else has there been such intensive study of the disease as here.

As to its history, you probably know that there is a mummy up in the University of Pennsylvania perhaps 2,500 years before Christ, looks as if it might have, and then there is a steel over in Copenhagen of an Egyptian king offering sacrifices with a withered leg, and the first person that I know had it was Sir Walter Scott, and we know
that because he was a writer, and wrote such a good description of how his illness began and so on, and his lameness, that it could hardly have been anything else than poliomyelitis, and then near Stutgard, there was a book written about in 1840, a large edition in 1860, and Dr. McCann up in Stockholm, a pediatric, described it around 1780, with various small publications, but there is one name, though, that we think of particularly, as Dr. Fitman, who started in on the pathology, and then along came the Swedish epidemic of 1905, and he worked out the epidemiology better than anyone else has, and saw these various forms of cases, although Dr. Kafferly in Vermont had described them in 1895 before that, these so-called abortive cases.

The first epidemic, though, we spoke about its being so much in the northern or the colder part of the temperate zone, the first epidemic in history was in West Feliciana Parish, in Louisiana, in 1841. It was described, I think, in the American Journal of Medical Science, in 1843, about nine cases, and some people doubted it, but it looks very much like that.

I just want to drop one little thing, that is very interesting, I think. I am afraid that I have exceeded my time already, but you know, we feel, and it has regard to prevention, too, that it is better not to protect our
children too much, and we will say with poliomyelitis, particularly, to keep them away from other children, and it is better to let them rub elbows and let them acquire some immunity, and we see immunity in the bloodstream by reason of the serum able to neutralize the virus, and we see, also, very distinctly a difference in the age incidence, in different communities, and much higher, in older ages, in the more rural, isolated communities.

We have had epidemics in various places, in Greenland, and one very notable one in Maru, an island on the equator, with very high incidence, about 200 per 2000 and it affected all ages there, just as measles did, you know, in the Fij Islands, when we never had any at all, and it affected everybody, not only children.

So that to some extent, the fact that it is predominantly a children's disease is probably due to general diffusion of the virus without frank cases of paralysis, or paralytic phenomena, I mean definite weakness, in the early ages, and the acquiring of immunity thereby.

But what I was starting to say was that away back there in West Felicia Parish, that all of our early outbreaks, the age was very low, when we apparently weren't having nearly as much as we are having now. I don't think that there can be any question but what such an epidemic
as occurred or radiated out from New York City in 1916, if
that had occurred at almost any historical period, we
would have had some record of it, because it was such a
tremendous affair, not in the death rate, but it did
cause so much paralysis, and the wide extent of the disease
is a phenomena of recent decades, let us say, or at least
the half century or so, and yet even with that, away
back there, the disease was a disease of the very young,
and if we only had time to look at charts, and study
them, that we have here, we would see that of all of these
ordinary diseases that we are speaking of poliomyelitis
is the only one which is of itself tending to get higher
and higher in the age group.

Now, I have already talked too long, and of these
charts, I don't know which will be the most interesting
and profitable to you.

Here is one Dr. Adams kindly sent down from her
office upstairs, which shows the trend of the disease,
each one of these white lines is of a different year,
and it is on a logarithmic basis so that each period
here corresponds to a unit. A unit is a multiple in-
stead of being additive, and this is 10, 100, and 1,000
and 10,000, and so forth.

These yellow pins are the way it occurred last year,
so that you see every year we have that peculiar seasonal
distribution.

Now, I don't want -- and you will ask some questions about that later, possibly, and I might mention this right now, to save your worrying about it, we can't say from that, that that argues any method of spread, either -- that is, the time when we have more or less, and it is the later part of the warm weather, the peaks around the first week in September or so, instead of being in the very hot water; that doesn't prove at all anything about the intestinal transmission or insect transmission.

You take diphtheria, scarlet fever, and measles. You think of those as being winter diseases, transmitted by the respiratory tract, and we have pretty good evidence that they are transmitted that way, and you will all agree.

Now, the time between the characteristic peak of poliomyelitis, and diphtheria, is closer.

Here is poliomyelitis, and here is diphtheria, and the time between those two peaks is only half what it is between the peak of diphtheria and scarlet fever, and it is somewhere near, only a third of the distance between the peak of diphtheria and measles.

In other words, those three respiratory diseases are farther apart than diphtheria, or either one, is from poliomyelitis, and so that we can't argue about the time of transmission, from the time of instance in the year.
It simply is a fact, and we will have to accept it, and we want to know more about it, but we will have to accept it that these diseases each have their characteristic epidemiology, and age incidence, and sex incidence, and geographically, and so forth, and just as each disease has its characteristic distribution in attacking the human body, just as we propell a case of smallpox from a case of chickenpox, from the location of that on the body more than anything else, and each of their distributions, and we don't know why smallpox favors the top of the body, and chickenpox the bottom, and so forth.

But the crux of the thing, that I did want to leave with you, is, that on these charts, that a mild illness during poliomyelitis season -- well, here are some of the symptoms:

Sudden onset, with headache, usually constipation, and often vomiting and fever, and quite a little prostration, and both drowsiness and irritability, and drowsiness and doesn't want the mother to handle him, and sensitivity of skin, often retention of urine, and sweating out of proportion to the room temperature, and often a flushing, and things of that sort, they are enough to make you suspicious, and that child should be kept absolutely still in bed.

There is one other thing concerned with that matter
of diagnosis, is that the more that we go into these cases, in detail, about their history, the more frequently we will find cases with an onset, with intermission, so that even if the child gets quite all right, and the fever subsides, and all, it is worth while to keep him quiet, and avoid over-exertion and strain during the poliomyelitis season.

And then, if there is particularly any little stiffness of the neck, or the back, you can't see it from there but this shows a sort of a test for flexibility of the back -- that is even more definite warning, during the poliomyelitis season; or here, you see, the curve, to keep that child at rest, in bed, and then if any weaknesses are found, these are some points on differential diagnoses, if any weaknesses are found, and it is worth while for a physician to test all of these phases -- these things don't amount to so much. Some of these -- I don't like to call it, but many people call bul-ber cases, any trouble with swallowing and so forth, are rather dangerous because that is near the phrenic nerve center, and sometimes the trouble with holding the neck up, and these different movements, especially this movement of being able to raise the shoulder on each side, and you have two sides always to compare, one side with the other, and these other movements here, and of course, the leg movements, and
we have great trouble with that, and here is one of the most frequently affected muscles, the palsies -- in the finger, which enables one to make a nice round hole and press the thumb and forefinger together, and a nice round one, and not this way, but a nice round one, and bringing it clear over to the other fingers, too, and that is one of the most frequent muscles affected, and also Dr. Phelps would tell you later, if he were talking on this, how terribly important these abdominal muscles are and sometimes one can get a little hint of involvement of the abdominals by the superficial reflexes.

I will read one or two of these things here to you:

"Examination for paralytic symptoms not merely to diagnose the nature of the disease but chiefly to ascertain which muscle functions are weak, so that at once something effective may be provided, and protection against stretching.

"Gentleness in the examination and concentration on the part of the patient under examination are necessary.

This is in large part from Jane McNamara, whom some of you know, from Australia, and through here, from Dr. McKenzie, partly.

"Man is an erect animal. The erect position has placed heavy demands on certain muscles, the hip extensors, these big muscles, and the knee extensors, and these muscles
in front of the thigh, and the trunk muscles, and the back
muscles, and it has developed abduction from the shoulder,
which the animals don't have.

By contraction and development of the hip and ex-
tensors, man has become erect.

And here is the bear, and the ape, and the kangaroo,
and man.

Then, therefore, do not throw away the chance of
recovery of these muscles by adding to the injury of
disease, the insult of stretching.

And when you stretch a muscle, you do more than
wring a dish rag free of nutrient fluid and blood. You
do just about what you do when you tap a knee and your
knee jerks, you send impulses continually back to the
anterior horn of the spinal cord, and those cells which
are the seat of the disease, and cause irritation there,
when what you want is rest, in those nervous centers, so
by all means avoid stretching.

This thing I would like to impress upon you, and I
am trespassing on Dr. Phelps' subject as well as his time
but one who isn't an orthopedic hasn't any business talk-
ing about these things, but wheel chairs cause more de-
formities than almost anything in poliomyelitis, and please
remember that.

Sitting insults these muscles, and hold your patient,
unless those muscles are perfect in the way you would like him to finish, that of an erect human, and not that of a kangaroo. It is futile to ask a child to refrain from sitting unless restricted.

These charts are not in the accepted mode of differentiating each muscle, and they differentiate, as you see, the different movements, and as we see these cases out in epidemics and remote places, I think that that is really all that we can expect the physician to do, to find which movements and if you will only strip the child and get all of the clothes off so that you can see just exactly what is doing, and see just which movements are weak by comparing one side with the other and what he knows of the natural movements of the child, those things can be protected, and if nothing else, they can be kept in bed and actually, I think, in a good many cases, splints are better than plastics.

Maybe a little bit of movement without too much confinement may help, so long as the stimulation and painful movement is prevented, and the posture is maintained that you want to end up with eventually.

Pardon me for taking up so much time (applause.)

Chairman Hood: Thank you, Dr. Leake. I am sure that there are many of us that would like to ask certain questions that you have brought out, and to start the ball
I would like to have you understand that we have here directors of State agencies administering services for crippled children, and these directors are executives in not only Departments of Health, but in Departments of Welfare, and some occasionally in Departments of Education, and different types of executive agencies, administrative agencies, but they all have a common problem as to medical care for crippled children.

And so, in the problem of prevention of crippling which is part of their concern, they are anxious, of course, for information as to just what sort of plans they should make, in regard to the prevention of crippling conditions and which they will meet during epidemics and in other words expenditures for nasal sprays, budgeting certain amounts for convalescent serum, and those types of expenditures.

I think that we would like to have your position once more, if you will, as to whether it is proper to plan for convalescent serum, and whether it would be proper to plan for any types of nasal sprays, in connection with an epidemic, and also one other thing I would like to ask you -- a thing which I have seen in several epidemics, the mass hysteria that develops during an epidemic, and whether the movement of families should be discouraged...
during an epidemic period, and you see people flying from one part of the country to the other in order to escape the disease, and I would like to have some of the rest of you ask Dr. Leake some questions, and we certainly do appreciate him giving us this new thought on it.

Dr. Leake: I will probably forget some of these. If I could figuratively -- I talked freely without realizing that things were being taken down, and I would be very glad to speak frankly about it. Just sitting here on the front seat, and talking with some of you about the things that you mentioned, I realize that each community and of course we know it, without talking among ourselves; each community has different problems and different ways of meeting them. It must have. There is so much difference between New York City, and I daho.

I don't see Dr. Harmon here. He talked to you yesterday or this morning. I wouldn't spend a cent for convalescent serum, and I wouldn't spend a cent for nasal spray. I would be very careful about how much you spent for iron lungs, so-called.

Now, that is just rough, don't you know, and there may be various reasons for changing that in different communities, but that is the way I feel about it. There is no doubt whatever but what the Emerson Respirators have saved lives. You know, though, that many of them are pretty
satisfactory, and yet they often die of pneumonia not long after.

At the same time, with some involvement of the phrenic nerves, we are not so sure about the Intercoastal, these last few years, how much they really do in respiration, except to keep the under-spaces from getting flabby and it may be the scalings and so forth that are more important in restoration, but any way the phrenic nerve that controls the diaphragm, when that is weak, Dr. Legge, up in Boston, I think, Dr. Phillips, has shown that a certain amount of muscle training, and exercise, is worth while for that muscle, that is, the respiratory muscle, as well as for the other muscles, the muscles of the limbs, which we think are particularly helped by carefully supervised muscle training.

Incidentally, about spending money, I haven't liked to call the people that treat this thing physiotherapists, and I like to call them polio-therapists, because I think it is a different principle that is involved in treating poliomyelitis than what is involved in treating most other, well, paralyses, and possible fracture cases, and injuries, and things of that sort, it is altogether different, in the way the thing has been handled, on account of the difference, and I expect Dr. Phillips feels differently about spastics, too, but I think that you have
to think of that.

Now, there were some other questions, Dr. Hood.

Chairman Hood: I think that you answered most of them, but we had a discussion this afternoon, Dr. Leake, with regard to the State Register, whether people who had an actual diagnosis of poliomyelitis should be included on a State register as crippled children, or whether or not they were actually paralyzed, and I would like to ask that.

Dr. Leake: Dr. Hood knows what I am going to say about that. It is a campaign that we have been, perhaps, I think, a good many feel, are spending a little too intensively, and we ought to be studying other things, but it seems to me it is fundamental to get at the basis of what things are, and unless we measure things by paralytic cases we don't know where we are.

For example, back when I started work in this, in 1912 of course we knew, -- Vickman had published his work in 1909, and Kafferly long before that, but we had looked for what we called abortive cases, non-paralytic cases. You could hardly find in intense epidemics, you could hardly find more than 2 to 5 per cent of the cases non paralytic. All we got were paralytic cases, and by paralytic cases I mean not only cases that are paralyzed but cases that show some definite localized weakness.

We even used to say, consistent difference in the re-
flexes, which could be proven by repeated examinations, which should have a break in that reflex, in the injury in the anterior horn cells.

Now, with increasing acumen on the part of the physicians, and spinal punctures particularly, by the way, I don't believe that there is any justification in doing spinal punctures on poliomyelitis cases unless you think you are going to do them good. I don't think that there is any justification doing spinal puncture for diagnosing poliomyelitis. If there is enough menengel symptom to make you think that the relief of the pressure is going to help the child, all right, but neither for administration of serum -- I am very thankful that the current administration of serum is not into the spinal canal but in some other way, and I don't believe that spinal puncture does any good and many of these non paralytic cases had been diagnosed on spinal puncture.

New York City offers a pretty good criterion of just how those things went, and they ran in 1916, I haven't the figures offhand, I should say roughly, though, in 1916, maybe 6 per cent of the cases were non-paralytic, and in 1931, possibly, I may be quite off on this, possibly 35 per cent, or maybe it was less than that, maybe about 17 per cent, and in 1935, about 35 per cent, and I am not quite sure, but it runs that way.
But on the other hand, we have other things. We spoke about cases being more frequent in the South than we have given the South credit for, and you know our epidemic in North Carolina, in 1935, and then in Alabama, in 1936, and this last of 1937, in Mississippi, all through Texas and Oklahoma, and so on, I can't speak so much -- I wasn't down the last year, but in the other years I know practically all of North Carolina cases were paralytic, and practically all of the Alabama cases were paralytic, but when it got up into Virginia, in 1935, across the border, and went up to Richmond and then to the west, where the University of Virginia is, and where anybody in the county, or for that matter, in Virginia, can come and get free attention, only 14 per cent of the cases were paralytic.

In Los Angeles, the preceding year something like 50 per cent, and over in Denmark, in 1934, only 14 per cent of the 4,500 cases that occurred in the Kingdom were paralytic, and Hagerslof, only 3-1/2 per cent, and now where are we?

If we are going to count just the cases reported, you don't know what is an epidemic, and you don't know where the disease is intense and where it isn't and we think that the only thing to do is to differentiate, and of course these cases that show these symptoms of early infection, such as we have spoken of, they do need rest and
attention, and so it is well for the Health Officer to know about them, but don't count them in comparing them with other cases, and they oughtn't to go on the crippled children's register, and furthermore, I would like to men-
tion, and I mentioned Jane McNamara, these are our own -- and John Paul and Jim Trask of Yale are responsible a good deal for those, and John Gordon of Detroit for those pictures up there, which were taken out in that hospital.

In recent years, besides poliomyelitis, of course, we have had since the war, this epidemic in syphilis that George Draper thought was poliomyelitis in 1919, and that reached its peak, and we haven't had very much since about 1924, of our ordinary poliomyelitis, sleeping sickness, but then we had our St. Louis epidemic in 1933, and that was an-
other thing. That wasn't the acute syphilis, but we got the virus out of that, and no one has ever gotten the virus out of the acute syphilis, and that has meningeal symptoms, and it isn't particularly like poliomyelitis but might be, but from epidemic, Dr. Armstrong isolated this virus, and those cases couldn't be followed from an early case of poliomyelitis, and then in 1935, up in Pennsylvania, I am sure that they had the same sort of thing in Philadelphia, and to lead on, but they had what we call Weinburg meningitis, which couldn't be told from poliomyelitis at all, from a mild polomyelitis, so that
if we call these abortive cases we may be including a whole lot of other things.

Chairman Hood: Any other questions?

Dr. Hilleboe (Minnesota): I would like to ask several questions. During the last year we have seen several reports from local hospitals about the use of sulphammid in some cases of poliomyelitis and I would like to have your reaction to that particular thing.

It is true that all of the reports have been negative, but many people ask about that, and it is a public health problem, and it is one that we should have definite information on it from a person with your experience.

The second question I would like to bring up relates to the type of case of anterior poliomyelitis, with paralysis, in which we may necessarily not have a great deal of involvement of the extremities or the intercostals, or the throat muscles, but in which we apparently are observing some very toxic effects on the body, so much that we are seeing surgical shock in these patients with the depression of the blood pressure, and the usual findings -- some of the hospitals have used rather large blood transfusions, of whole blood, and not necessarily from patients with antro poliomyelitis or necessarily from the parents, but with beneficial results as far as the life of that patient is concerned, and we are interested
in the mortality in these cases, of course, as well as the individual result, and I would like very much to know what you think about the use of the blood transfusion in that type of case.

Dr. Leake: About sulphamid, I don't believe that these conferences are much good unless we can talk quite frankly, and please don't publish them without my permission.

Dr. Armstrong -- I have quoted him because we have worked together, on that encephalitis, and he was the first to show, I think, that sulphamid did some good, and did something in these cases, but I think that you have noticed reports that Dr. O'Shea up at the Presbyterian at New York, whom we all think most highly of, and he published that first monograph in 1912, from the Rockefeller Institute on Poliomyelitis which is very, very valuable, but perhaps Dr. Phelps knows about that, but that hasn't been repeated, and although that looked good, we couldn't recommend it on the present basis, at all.

As for transfusion, I don't see why transfusions wouldn't be just as good as serum, and we know that some of the Illinois workers have found that general serum is as good as convalescent serum for poliomyelitis.

As to those extremely toxic cases, of course most of the workers in the hospitals, where severe epidemics have occurred, have believed that there were cases that involve
the center of respiration, which don't involve the muscles of respiration, and the character of the respiration, and so forth, is different, and I am just from Missouri on it, and I am the only one that is. Most everyone acknowledges that there are those two different kinds of cases which are so apt to be fatal, those with frank respiratory paralysis, and those with just perhaps irregular respiration and just die anyway, without definite paralysis.

Now, I don't think that we have any good physiological proof of the respiratory center in man, apart from the centers of the nuclei of the respiratory nerves, but there may be.

There are a lot of other things, of course, and we just mentioned them, and I don't know about some of the cases that I have seen myself, something that you mentioned, extremely toxic cases, and I haven't been sure always whether we were dealing with encephalitis or poliomyelitis, and there are two things that I want to mention, though.

Just today has been published -- only very few copies came off the press, so I think it won't be available for a couple of weeks, Dr. Hood and I have talked about it, and Dr. Phelps, of course, is very much interested, and probably he will mention it later tonight, you may care to take
the name of it: "Care during the recovery period in Poliomyelitis."

It is Bulletin No. 242, April, 1938. Public Health Bulletin, and priced at 20 cents.

I think that it is the most detailed description of that. Dr. Bennett mentions several things that are interesting in the introduction.

I don't think in any language has been published anything as detailed as this. It is simply astounding to me how the Germans just disregard this thing. They don't give it anything like the attention it deserves.

Now, soon will be published -- the page proof of this has been over some time, -- a bulletin by Dr. Gillum on that very interesting epidemic in Southern California, and particularly in the Los Angeles County Hospital, among the nurses and physicians. I will read a bit of the introduction, that Dr. Gillum isn't responsible for. I wrote this myself; but it is on his work:

"The evidence is clear that the cases were conditioned by employment at the hospital, where the great bulk of the patients with undoubted poliomyelitis occurring in Los Angeles County were treated. Dr. Gillum has good grounds for assuming that the majority of the cases among the personnel of the hospital resulted from infection with the virus of poliomyelitis."

That is, on epidemiology, Dr. Gillum's paper shows
in his report, the exact concurrence in time and other things, and the epidemiology with the poliomyelitis that was undoubtedly occurring in the county at large.

"The chief reasons for entertaining another opinion are the unusual symptomatology and the unprecedented spread within the metropolitan institution of adults. On the other hand, the time relations with the disease occurring outside the hospital, and treated in the hospital, and the fact that the age grouping in these outside cases was also unusually high for poliomyelitis, and the spread of the disease among the hospital employees and those apart from those concerned with the poliomyelitis patients, all speak for the identity of the two disorders.

"The whole description and analysis of the epidemic here displayed can leave but little doubt in the mind of the reader that those individual cases might be variants or wrongly grouped with the epidemic, the prevalent disease among this personnel was a unit and closely related to occupation.

"Of particular interest is the randomness with which the 25 case descriptions in the appendix were drawn from the group of nearly 200 comprising the outbreak.

"There were others in later years where some count up to about 200 but there are about 200 which Dr. Gillum considers here.

"Such a sample should be representative of the whole.
Yet the absence of typical histories of poliomyelitis is striking. Cases with sharp febral onset and meningeal symptoms soon giving way to a persistent and definitely localized flacid weakness overshadowing the other symptoms apparently did not occur. Clinically, and apart from their epidemic characteristics, none of these cases are definite poliomyelitis. Yet such a diagnosis was a justifiable assumption from all of the circumstances, including the nonvariability of the disease.

Chairman Hood: Well, Dr. Leake, we certainly thank you, and you have certainly given us a very fine view of this thing, and just the sort of thing we wanted you to do.

The next speaker on the program has conducted research and clinical work along this particular line for a number of years. The work which he is engaged in at the present time has been carried on in New Jersey as a special project of the New Jersey Official Agency, and I think it would be only fitting and proper to recognize the fact that Mr. Joseph Buch, who as administrative officer of the Crippled Children's Commission in New Jersey has had the foresight to see the tremendous possibilities of a special project of this kind, and has organized it, and the project is now showing such excellent results, and I would like to have Mr. Buch introduce the speaker. (Applause.)

Dr. Buch: Thank you, Dr. Hood, and ladies and gentle-
men, you have heard during the past two days this very interesting discussion on crippled children's work, and New Jersey has a project on this.

I do want to give true credit to Dr. Phelps for everything that we have accomplished. If we have had success in every way, that is due to the efforts of Dr. Phelps. He is very closely associated with that for the past year and a half and I just want to say personally that he has been doing a pretty fine job.

May I at this time publicly express on behalf of our Commission, the sincere thanks of everyone involved, to the Children's Bureau, for being permitted to undertake such an interesting study, such an interesting project? We hope that within the next few years we may be able to present to the world at large, very interesting facts in connection with cases in this category.

Dr. Phelps is well equipped to do the work, and Mr. McIntyre is a full-time psychologist, very well versed in cases of that character, and may I say that we are very much interested in that project in our State.

Therefore, it is not only a privilege, but a pleasure, for me to personally present to you Dr. Phelps. (Applause.)

I just wanted to tell you about the fine work he is doing in our State.
STATEMENT OF DR. WINTHROP PHELPS

Medical Director, Babbitt Hospital, Vineland, N.J.

(Care and Treatment of Children Suffering with
Cerebral Palsy.)

Dr. Phelps: I might say, for Mr. Bush, that in any
project of the size that we undertook in New Jersey, the
actual medical handling of the project is a very small
part, and that if I had had to do all of the organizing
and all of the selection and work that goes with it, I
don't believe that it would be running now, and Mr. Bush
did all of that work, so that I can say that he certainly
deserves a great measure of the credit for it.

To consider the question of cerebral palsy as an
entity, the history is very interesting.

In 1862, Dr. Little described what was known as
Little's Disease subsequently, and which was the following
sort of an individual:

A child with a cross-legged gait and stiff arms and
legs, who drooled, who couldn't speak very well, and who
was feeble-minded.

That was either called Little's Disease or spasticity
and the child was spoken of as the spastic.

Now, all of those cases, at that time, were in asylums
for the feeble-minded, or for the insane.

In 1862 there wasn't much difference between the
insane and the feeble-minded. In these asylums were also
a large number of assorted cripples, who were mixed in,
and placed there simply because there wasn't any other
place for them.

There has been a gradual weeding out of the general
type of asylum into institutions for specific conditions.

Of course, we are familiar with the institutions
for the blind, and the deaf, which were the first types
to be split off, and probably were distinct long before
any other types were formed, but later there came to be
the actual insane asylums as distinct from the feeble-
mined hospitals, and that distinction is now very clear
to everybody.

The crippled children's hospitals were then developed
and never were mixed really with the insane asylums, but
in the crippled children's hospitals, and in the feeble-
mined institutions, were found these cases which didn't
belong very well in them either.

In the first place, the function of the crippled child-
ren's hospital is to take care of the physical side, and
that is no problem to the educator. In other words, ed-
ucation of the average crippled child is a perfectly simple
matter, which can be carried out by any ordinary school
teaching system. In the hospitals for the feeble-minded,
the physical side of the patient is no problem, but the
education is a very great problem.
Now, we have the group of cerebral palsies who present both a teaching problem, and a physical problem. Naturally, they have strayed into one or the other of the two types of institutions, and neither institution has been capable of taking care of both ends of the problem.

I think it is advisable to consider just what is the size of the problem. That means, how many cerebral palsy children are there in the country. Well, spastics is what they are usually called, but spastics represent only a certain percentage, less than fifty per cent of the group of cerebral palsies. The children with involuntary motion, which are usually spoken of as athetoids, account for another large percentage, and both of these percentages running about forty apiece.

Now, the spastics are stiff primarily, and the athetoids make motions primarily, but in order to control these motions, they stiffen, so that as you look at them, in many instances, they are very difficult to tell from spastics. I have had experience with a few that I have had to spend three or four months watching them closely before I have been able to come to a decision whether they are spastics or whether they are children with involuntary motion, or athetoids as we call them, for brevity.

In these children you usually think of crippling as involving the arms and legs and perhaps the back, the torso,
in conditions such as scoliosis, but you forget, usually, about the fact that this crippling can involve not only the muscles of the face and the speech, but the diaphragm. What is to be the effect on the children with a spastic diaphragm?

I am using these words rather loosely, because nobody has ever been able to prove whether the diaphragm is really spastic or not, or whether it is secondarily affected by spastic abdominals. Well, a spastic muscle responds to the maximum to any stimulus, so that if you excite a spastic with a spastic diaphragm, he will respond with a very maxima emotional overthrow, which will make him appear to you for the moment as an idiot.

The athetoids, on the other hand, may have involuntary motions of their faces, so that they grimace and drool, and respond with the wrong type of response to the stimulus that you are supplying. So that in both of those groups you have characteristics which are actually crippling if you mean by crippling inability to move some part of the motor system properly, which makes them look as if they were feeble minded.

So you have to think, therefore, of five extremities, the two arms, the two legs, and the speech-face mechanism, as being possibilities for crippling. If you have this speech-face combination you have to be very careful in
making any decision about actual feeble-mindedness, because you cannot tell by looking at them, possibly. I have seen children who on first sight would give the appearance of being very brilliant children, who on a real thorough test turned out to be defectives, and I have seen terrible looking children, drooling, and laughing, and making funny glutteral noises, who on actual test proved to be very bright.

Of course, the Binet test, and other such tests fall down pretty badly with these children. In the spastics, the time element has to be disregarded entirely to get an exact Binet measurement, and then it isn't exact, and I should have said a more exact Binet measurement. In the athetoids, you have got to allow for all of this involuntary motion, and you have got to allow for "eye-to-hand" coordination, and in many instances there are hidden defects, and eye defects, which because of the massive crippling of the whole child are never noticed.

Now, we know that to teach the blind requires a certain type of teaching, and just because a child is crippled and doesn't learn, doesn't mean he is feeble-minded, if you have an eye defect and don't apply the methods of teaching which have to be used with sight-saving groups. So that I just give those points to show you how complicated it is.
However, I don't think that there is really any confusion between actual feeble-mindedness, and cerebral palsy. Normal people can be feeble-minded, and people with cerebral palsy can be feeble-minded, and non-crippled children can be mentally normal, and so can crippled cerebral palsies.

The difference between them, and poliomyelitis, for example, is mainly due to the fact that they have had the crippling since birth, and never learned the fundamentals of motion, and thought, and activity, which even a child of two who has poliomyelitis has established very thoroughly, because most of these fundamentals are learned within the first three months - I mean the actual fundamentals of alternation of the legs and the reach and grasp and things of that sort.

Nobody knows exactly how many of these children there are in the country. I have no idea myself, but I have some figures which may throw some light on the size of the problem. There is a school for crippled children in Baltimore which requires an I.Q. of eighty before taking the children into the school. In that school, there are seventy-five children with poliomyelitis, and sixty with cerebral palsy. Now, that is a slightly smaller number of cerebral palsy cases, but remember that they are selected as being children with I.Q.'s above eighty.
Now, in the New Jersey survey that we have made for the last two years or so, it has been found out that approximately thirty per cent of the children that we have examined are truly feeble-minded. That is a comparatively large number of cases. That means that sixty per cent of them are mentally normal, or better than normal, and therefore, if we should say that thirty per cent of the children in this Baltimore school had been kept out because of a low I.Q., we would have eighty-five to ninety cerebral palsy cases against seventy-five poliomyelitis.

Of course, the spread of polio is not uniform. Baltimore, and I think Dr. Leake will bear me out in this, is relatively low in poliomyelitis, so that that really doesn't give you an exact thing of it. In the State of Maryland, in the files of the Maryland League for Crippled Children, there are 601 cerebral palsy cases listed. Maryland's population, I think, is about one million and a half, is that right, Dr. Voshell?

Dr. Voshell: Approximately, yes.

Dr. Phelps: That would mean about four hundred cases to one million, or forty to the one hundred thousand, and in New York State I have some figures, that are very inaccurate, but it is that there are approximately three thousand listed so far, and we have been making a survey there, in the state, exclusive of the City.
If their population is about five or six million, it would come to about the same percentage, you see, so that it can be said that the general distribution is forty to fifty per one hundred thousand, as nearly as we can figure out now. That is quite anumber of cases. Cerebral palsy has always been listed as the second greatest cause of crippling at the present, in this country, and poliomyelitis being the first, as Dr. Leake said; but I don't know but what when all of the cases are found, it may exceed the general distribution of polio.

However, polio is variable very much, of course, and we can't tell from year to year what is going to happen in that. I might say, in this Maryland League file, there isn't any case, of course, of well-to-do people, and they are all practically from the groups in which the various welfare groups are interested, so that there must be a good many more than 601 cases, and perhaps double that in the state of Maryland, I don't know.

Now, that shows that there is really a problem to be considered. Now, what about the type of paralysis that these patients have? We find from all of the surveys that I have been interested in, and probably that must amount to five or six thousand cases all together, that the spastic paralytic, that is with both legs paralyzed, and nothing particularly wrong above the waist, is the most
common type. Now, that kind of a patient may have something wrong above the waist, in that when attempts are made to move the legs, the speech or arms are interfered with. But that when the legs are perfectly still, the speech and arms are all right. Now, that kind of spastic is entirely different from the one who is perfect for the waist up.

Obviously, the treatment of that type of spastic is very simple. Educationally, there is no problem, except in getting the child to and from the school. Immediately, of course, the medical problem is, can you or can you not teach this child to walk, and that is all that there is to that.

With the hemiparaplegic, where one arm and one leg is involved, that is a very difficult problem. There are any number of occupations that can be indulged in if both the arms are good, no matter how bad your legs are, but if one arm is bad, even if one leg is good, you are limited very markedly in the type of occupation that can be worked out.

The number of cases with speech and emotional and breathing involvement are relatively small. The hemiparaplegics are almost as common as the paraplegics, and in this classification I am including both the spastics and the athetoids, so that the problem is really what to
do with the extremely severe cases, which would include most of the speech and face cases. There would be a few exceptions to that. What to do with the hemiparaplegics, and what to do with the paraplegics — that is from a rehabilitation standpoint.

Now, as regards the division into spastics or athetoids, or spastics and involuntary motion, the reason for the importance of that is that they are two separate and distinct conditions, and that is why I object to the term spastic for the whole group.

You cannot improve an athetoid by physio-therapy, which will work in the spastic, and you cannot improve the spastic with athetoid physio-therapy, because, well, it would take me too long to go into the details of that, but they are two entirely separate conditions, and it is absolutely necessary for the — what did you call them, the "polio-therapists," well I would call them "palsy-therapists," — to know what they are dealing with.

Then, they must have extensive training in how to carry out these two types of treatment. The therapists, the polio-therapists have to learn how to make complete muscle examinations, to know whether the muscles are fair, good, poor, or normal, and a zero muscle. In the spastics they have to know which muscles are spastic, and which are normal, and which are flacid, because there are flacid
muscles in spastics. In the athetoids, they have to know which muscles show involuntary motion, and which don’t, and it is only on the basis of a thorough muscle examination in those two conditions that any improvement can be made which is at all comparable with the improvement that can be made in polio.

No technician would think of treating a case of polio without the muscle examination in front of him. There is no reason why a case of spasticity or athetosis would be treated without a muscle examination. And yet the making of these muscle examinations is so difficult that the technicians must be expert in making polio muscle examinations before they can even do that.

Another reason for the importance of the differentiation into spastics and athetoids is for the sake of the mental testing. If you know whether a case is a spastic or athetoid, you can then allow for the proper type of difficulty, and have that advantage in testing the mentality. We found that out by putting children in educational systems afterwards and finding whether they would respond to teaching or not. That method, of course, will really show you whether a child is teachable or not, and a Binet test is supposed to be a short cut to that end.

We find that if you try to do a Binet test on a
spastic, assuming that he is an athetoid, and if you are experienced in doing those tests, that your answers will be entirely wrong. So that is important from that point of view, also, to do that, to know which of these two things you are dealing with.

In other words, the problem is a problem of two diseases, and not a single thing like poliomyelitis.

Now, if these things are worked out, these differentiations, then a great deal can be accomplished in these cases, but you must determine first what your accomplishments are to be, and if somebody says here is a spastic, put him in a hospital, what can you do with him?

You must decide, are you to teach this child to walk, or are you to teach him to use his eye-to-hand coordination for writing, or are you to teach him to speak. Those must all be considered. In many instances, walking isn't very important compared to a lot of other things.

If you have a child who can do nothing for himself, and can teach that child to get in and out of a wheelchair, to dress and undress himself, and to feed himself, and to speak, why, walking is a relatively unimportant thing. It is often true that such cases are seen where the legs are so bad that walking is out of the question, and I have often seen cases who have had so many operations,
operation after operation, on legs which were hopeless to start with, and nothing has ever been done about the arms, and the speech, and the feeding, and the dressing, and the wheeling of a wheelchair, and the child has been allowed to lie in bed for ten or fifteen years while dozens of operations were done on legs which never could have been trained anyway.

But the fact that a child cannot be taught to walk doesn't mean that he is a hopeless case, and should be discarded right away. But the question should be raised as to what you are actually going to teach this child to do.

You should have definite aims, and accomplish those aims, and then if they are well accomplished, you can take up what may seem at first to be a more difficult or more impossible aim.

In the school in Baltimore we operated since the first of this past October, and we have two girls of seventeen who had never walked in their lives, and they are both walking now, after six months, with no surgery at all. That is the opposite of what I was just saying, that walking wasn't very important, but these girls had learned to do a lot of other things. It had never been supposed that they would ever be taught to walk, but they had gotten to do the other things, such as talking.
and dressing and typewriting so well, that we felt justified in giving some time to what looked like perfectly hopeless balancing, and both of those girls are walking. It can't be said that they would have grown into walking if you had let them alone, because they were already seventeen years old.

In the hospital in New Jersey, that Mr. Buch is responsible for, we have a great many types of improvement. We don't only consider teaching those children to walk, because the facilities that we have to offer preclude our taking any non-walking children. However, we did take two non-walking children, because we knew that they were going to walk inside of a month, through no activity of ours, I mean, but we were justified in taking those two.

We haven't specified though in that unit how they must walk, and so several of them can't walk without crutches, but we are going to start a pile of crutches over in the corner gradually, because they are all getting rid of them, and also braces, too, and we are going to collect them as souvenirs.

Now, the great problem of the condition at the present time is not, can you treat these children, can they be improved, because we know that they can, and there isn't much question about that. But the question is that
we need trained technicians. Now, there isn't a word in
the literature about how to treat these children, except
a few scattered papers that I and two or three other people
only have written. I am trying to get a book written, and
I hope that it will suffice some day, but it isn't written
yet. There isn't any unified opinion about how to treat
these children, as there is in polio. Polio at present
is well understood, and the treatment is unified, and
people throughout the country follow the same methods, by
and large. If they don't, they should, because it is a
settled question, how to treat poliomyelitis.

The treatment of cerebral palsy is far from settled,
and a great deal of the treatment is perfectly worthless.
In many so-called institutions, the children stay from
year to year, and the treatment is just knowing what to
do, and it consists of practically nothing, catering to
the children's happiness, is about what it amounts to.

The thing must be done, to establish places where
technicians can be trained as post-graduates in how to
treat these children. The trouble at the present time is
that there are so few technicians who really are experi-
enced that they are all tied down treating children.

We are running into that difficulty in the New Jersey
project right now, because we are taking in more children,
and that means that the time of the one highly trained
technician that we have there, who is a teacher, is being taken up more and more with treatment because otherwise the children won't get treated, and then we can't show results. The training is therefore beginning to go by the board.

In the Children's Rehabilitation Institute, which is our Maryland one, we are running into the same trouble, but we are trying very hard there to increase our technicians as fast as we can. That is as fast as we can work it. It is essential that technicians be trained for this, or else there isn't any use in trying to carry out the work to any very great extent. But I think that the number of cases that there are, prove that it is a real problem, and second only to polio in numbers, and it therefore merits a great deal of attention in all of the states, because it isn't a spotty condition, it is fairly evenly spread throughout the country. (Applause)

Chairman Hood: Thank you very much, Dr. Phelps.

Before we show the films, I am sure that there are questions which many people would like to have you answer, and I do want to say this, though, that we have three films from the New Jersey project, which I think will graphically show some of the work being done for this group of cases, and following that also we will have two films from the Baltimore hospital school, I think it is, that

Provided by the Maternal and Child Health Library, Georgetown University
Dr. Leake spoke about, which is the films which are described in the book to which you have referred, that the Public Health Service is putting out, showing the Kendall method of approach.
1. Miss Thelma McGinty (Montgomery, Alabama): How many children are maintained in the hospital at a time, and the staff that is required for training these children, and the other question is about what period is required per child, if that can be estimated?

Dr. Phelps: Well, what school do you refer to?

Miss McGinty: The Babbit school.

Dr. Phelps: There are 21 children there at present, and we have found out that a technician can successfully treat about six children a day and not more than that, and if they do, they get stale, and if you consider six hours of actual treatment per day that is plenty.

Now, the amount of the staff, it would run about one physiotherapist to every six children if you plan to treat them every day. If you plan to treat them every other day, there is one physiotherapist to every twelve children, and in many places, and under many circumstances, I think treatment every other day is worth while. If you have a child in an institution, however, I think that a great deal quicker speed can be attained in improving them by treatment daily.

Now, you asked how long it takes for a child to stay, and that depends upon the severity of the condition altogether. I should say that from one to five years is probably the average.
Of course, schooling has to be taken care of during that period. The state might not have to for that whole length of time, but I mean that it might be for a few months each year that it will have to give the child a sort of a push and then let the child work on what he is doing, and then give another push, and it would be somewhat like the surgical stage in polio when children may have to have four or five operations and perhaps will have one operation a year and stay in the hospital three or four months following that.

In other words, five years for the treatment of a child of this sort sounds like a long time, but when you think of polio where you have first the acute stage and then three or four years of that secondary stage, and then you have three or four years of the surgical stage so that in many instances on polio cases it would take from five to maybe eight years, and these children will take somewhat the same length of time, I think.

Miss McGinty: Are the families able to cooperate with you when the child is back home, that is what I understand that you mean to be sent back home for a time?

Dr. Phelps: Yes.

Miss McGinty: Are they able to cooperate with you in the training that you are trying to provide for the child?
Dr. Phelps: In many instances they are, and we have found that the mothers are no good, and their emotional tie-up with the child is too close, and it is just as impossible for them to treat them as it is for the mother to give the child piano lessons. A neighbor who doesn't play as well will make the child go along faster in piano lessons. However, we have a lot of mothers who can do it, and we have a good many fathers that can do it, and sisters and aunts and nurses, and governesses in general know too much and they improve on our methods and then the child suffers. However, if they are moderately intelligent and can follow directions, and if we can bring them to the hospital for a week or ten days before the child is discharged then they can carry on for a period of a number of months.

Miss McGinty: How does the field staff in your state cooperate with these cases under the set up?

Dr. Phelps: The field staff has not yet become a reality in the New Jersey outfit because we haven't finished training the trainers. We hope that they will cooperate fully.

Chairman Hood: I feel sure that some of these states are considering programs of this sort and I think that they would be interested, first of all, in the character of the staff which you have assembled at Babbit Hospital, in the hope of training others and in the different personnel
that you have there, and sort of the background of those people, and I mean the type of service that they render, and the selection of cases which you have taken on to demonstrate the possibilities of such a project and what you hope to accomplish in a certain length of time, with those cases, and I think that they would be very much interested in that.

Dr. Phelps: In the New Jersey unit, we have for a physiotherapist a girl who fulfills all of the characteristics that I would want her to fill, in other words, she is ideal. She is started off with a physiotherapist training and not a nurses treatment. Nurses are interested in sick people and physical educators go into physical education to improve skills, and it is a perfectly ideal thing to improve cripples because you are simply teaching skills, and they are not sick people, so that nurses don't know enough anatomy either and physical educators are taught a good deal of anatomy in physical education schools, and that should be followed up with a thorough physiotherapy course from a recognized school of physiotherapy which this girl also has, and then special practice in the treatment of infantile paralysis.

Following that, they are ready to be trained for this kind of work which this girl was trained for about three years, in the special field. Then, of course, she should be a teacher so that she can teach the subject to
the techniques which this girl can do if she has time, and which at present she hasn't, and so on.

We then have a psychologist who should be a man experienced in child psychology and abnormal psychology, and it don't necessarily have to be a man, he happens to be a man in this instance, but one who is also familiar with spastics and athetoids so that he can distinguish them in order to make a better evaluation of their intelligence.

We have, in connection with the Babbit hospital, that is the New Jersey one - I don't know much about the educational set up except that it is the Vineland school. This school has been set up to attempt to teach feeble minded children so that they have gathered together the very best teachers that they can find because they have to get knowledge into resistant brains, they certainly will have no trouble in getting it into the handicapped children.

In the Maryland School that we have, we have a teaching set up consisting of teachers who have had graduates of special education courses such as those given in Columbia, and who have had experience in teaching the handicapped of one sort or another.

I think that a good deal of attention should be given to the diet in these set ups because the spastic have low caloric requirements, lower than the average child, and the athetoids have very high caloric requirements, so you have
two diets, and in other words, these children are different
in every particular.

I know one athetoid that we tested and found that he
had caloric requirements of six thousand calories a day to
maintain him because he was in so much motion all of the
time, and he burned it up as fast as he took it in. The
children that we have taken in that unit for the New Jersey
experiment have all been children of the genius group and we
have taken no children with an i. q. of 100, they have to be
better than that. We have searched through a huge mass
of material in the state of New Jersey to find these 21
children. There are hundreds more with i. q.'s which are
within normal limits that we could take in if we had the
facilities that would fit the picture in other ways, but
this group is limited to boys between five and fifteen
and they have to be in the group of superior intelligence.
They are a very interesting group to work with and the
response to training itself is very remarkable.

Miss McGinty: What is the minimum age for admission
to your school?

Dr. Phelps: In New Jersey, the minimum age is 5,
because we have to have children of school age and we have
no way of taking care of babies. However, that shouldn't
be the minimum age in any institution, and we haven't got
any minimum age in the Baltimore institution, and we would
take them the day they were born if we could get them.

Dr. Greer: I would like to have Dr. Phelps give us some concept of the ideology of these conditions and also ask if you have considered the use of occupational therapy in the treatment of both conditions, and if in your school or in your project, in the school you have considered the advisability of constant attendance service in an attempt to shorten the duration of the period of treatment.

Dr. Phelps: Let me see, I have forgotten what you you said first.

Dr. Greer: The ideology —

Dr. Phelps: I will go very briefly into that. The ideology is a triple ideology congenital condition of the central nervous system, birth injuries, and pus, and syphilitic manifestations. Those are the three things. By birth injury, however, I don't mean obstetrical injuries. We find a large number of these children who are premature born very fast and what happens is that they get the bend just like a diver coming up too fast and the pressure in the uterus is intense on the child and the air pressure is low, and being premature the blood vessels are not very strong and the change of pressure causes a cerebellum hemorrhage, and that is a very common cause of so-called birth injury, and it is birth injury, but it isn't obstetrical injury. I think that the actual obstetrical injuries are
very low in number. I don't think many of these cases are preventable at present.

I suppose that if the doctor and the mother and the nurse could be in a compressed air room throughout the whole of labour and birth, and then decompress the whole bunch of them gradually, you might prevent a few, but not many in that way, and then your second question was what?

Dr. Greer: The advisability of using occupational therapy.

Dr. Phelps: Occupational therapy is very important. We use physical therapy primarily to teach fundamental motions which many of these children don't know. In other words, you can't teach a child to walk if he can't reciprocate and if he can't swing one leg one way and the other the other way at the same time, and we teach primarily arm motions, as soon as we can group those motions into any kind of activity that the occupational therapist can think of we shift them over to occupational therapy.

Your third question was about constant attendance. I don't know quite what you mean.

Dr. Greer: No, I mean constant attendance on the child when he is dismissed from the project in which he receives his actual instruction, because many of these cases of which you speak of that have the face-speech effect cases, are unable to express themselves to the nurses when
they go back in the wards, if they are confined to a hospital, and the first thing that comes out of those, he is in trouble on account of the fact that someone has misinterpreted his wants, and if he would have someone to reassure him, and someone to assist him, when he is alone again, and not with his kind, patient, physiotherapist or occupational therapist, I wondered if you had found that you had used a system of that sort — where someone who understood him and cared for him through most of the hours of the day that he was awake.

Dr. Phelps: I might surprise you by saying that that has been the situation with a large number of them, especially with speech defects; before we get them, the mother has been the constant attendant, and the child has developed no desire to speak whatever because the mother understands everything that he does, and his sign language becomes so perfect finally that the rest of the family begin to understand it, and you can never teach that child to talk. You have to refuse to understand his sign language and he has to suffer a little bit. We do not, in our school, either the New Jersey or the Maryland school, understand those children's sign languages, and after the first few days when perhaps they are getting sort of accustomed to the place, we have them understand that from that moment on, we are not going to understand their signs, and that they
have got to get words out, and they will do it. It is surprisingly how soon. They may be very poor words, but they have got to make speech attempts. I had one girl who had a constant attendance for sixteen years, and she had never spoken a word, and then fortunately, from my point of view, the attendant died, and within one year that girl was talking perfectly well. I don't think that constant attendants are a good thing.

I had another boy from New Orleans. The family had a good deal of money and they had about six colored men who stood around that boy all the time, around his bed, and they buttoned every button and they would scratch his nose, and they did anything he wanted, and he didn't move a muscle for eight years, and he never did one single thing. When we got him in a school where there wasn't anybody to do anything for him, he began to do the things.

Dr. Greer: I think that you misinterpreted what I was speaking about. I meant, do you think that it would be advisable to have individuals who would act in the capacity of attendants who would be trained by the physiotherapist and the occupational therapist and the speech pathologist to see that each of the things which they had instructed the child, each of the things which had been carried on where he received his treatment that it would be carried out under the supervision of the attendant, assuming
that we do secure someone who was intelligent enough to transmit the orders to, to see that they were carried on.

Dr. Phelps: We found that there are two points of view about that. It is like the little dog that you can teach to walk on his hind legs, but he never will unless you ask him to. An attendance like that would keep this child walking on his hind legs all of the time, but the minute the attendant would go he would be so relieved not to have to do it, that he would drop back to his old habits. We find staleness is a tremendous difficulty in training these children because we are teaching them a technique just like learning to play golf or learning to play the piano, and if you overdo it, they get stale, and then they get neglective, and fight it and won't do it. We feel that if we can simply give them enough time per day on this thing, so that eventually it can be transferred into the habit level, we will get ahead much faster than by trying to keep them at it all day long. They can't stand it, and it is a matter that is very difficult, and we have got around it in different ways. We have had a system in one of schools of rewards where the teachers, the house mothers, and the physiotherapist and psychologist and everybody else have been told to look for a certain thing, a particular child is supposed to do, and they all have copies of what each child is to be checked for that week, which is cor-
rect walking, or the proportion of the head, or what not, and every time one of these people observe the child doing a thing the correct way, he goes and checks this chart, and the child who has the most checks at the end of each week gets a reward, you see. You see, that works. I don't know how long it will work, but we may grow into staleness on that, but to keep referring to it all the time, and to keep a child at these things will only last a very short time before the child will completely buckle and fight it.

Mrs. Marguerite Ingram (Madison, Wisconsin): I would like to ask whether you keep the spastic children separated from the other children in your school?

Dr. Phelps: That is very definitely advisable because they require a different kind of a set up. They don't mingle with the polio children. None of the crippled children's hospitals like to have spastic, as they call them, and, of course, the feeble minded hospitals don't like them because they are too hard to take care of and they don't fit in and it is much better to separate them and have a whole separate set up, dining room and everything.

Mrs. Ingram: I was thinking particularly of the day schools for crippled children where you have - at the present, we happen to know that the classrooms of other crippled children go out at different times.
Dr. Phelps: That is a very questionable thing, I think, whether it is necessary or not. I think that it is hard for a teacher to take care of more than a certain number of spastic children at a time. It would be better to put one or two spastics, let us say, to a group of forty normal children, so that the teacher would only have one or two to look after than to put them in with other children, other spastic children. That is a difficult thing to decide and you can't teach very large number of them at the same time. The teaching has to be pretty individual.

Dr. Leake: Does occasional toxic impedia come into the picture?

Dr. Phelps: We don't accept them in the hospital, the epileptic children, in the hospital either at New Jersey or Baltimore. I think that it is too much of a problem, and the tendency is for the epileptic to go down hill, to degenerate mentally, and I don't believe that they are in many cases worth working with. There are some who have attacks so seldom that there isn't much gradual mental damage but in those where it occurs very often, I think that we ought to spend our time on the ones that are more hopeful.

I think that the number of cases that we have is remarkable. We don't see many.
14.

Dr. Leake: How about surgery?

Dr. Phelps: There is a lot that can be done by surgery and very little can be done for the athetoids except when they are very extreme, but there is an operation that is described by Putman which will eliminate a great deal of the motion, but it is a great deal more a physical therapy proposition.

Chairman Hood: We have the films from the New Jersey project.

(Following the showing of films, the conference was declared adjourned.)