PRESENTATION OF TYPES OF THE MENTALLY DEFICIENT

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By and large we can divide our population into two groups.

In the first group we find that the mind is deficient but that there is no somatic disturbance. The growth energy of this particular group seems not to have been equal to its task of completing the full development of the child. We will start in today by showing you some who belong to this group.

(Four boys and four girls, whose chronological ages varied from 13 to 17 years, were questioned as follows:

Q: What grade are you in? A. Fourth grade.

Q. What kind of a problem did you work out? A. Long division.

They were excused and their papers passed around for inspection.)

This little by-play of handing in the papers was sort of a "bluff" to get them in here without their knowing what was going on, that you might see what the different mental levels look like.

Those children have a mental age of ten years. In fact, they are the brightest children in our school. Their I. Q. is 66. We can expect children of this level to reach the fourth grade and possibly get into the fifth.

The boys in a manual way can learn to set and sort type. They can set up a loom for weaving. They can take care of hot beds, distribute and collect vegetable boxes as needed. They can act as helpers to the electrician and to the steamfitter. They can cut and thread pipe. They can assist the cement maker by making forms for cement walls and floors. They can learn to do shellacing and varnishing. And in the band they can learn to play the cornet, the bass.

The girls can do basketry, make raffia and reed baskets. They can embroider. They can operate a two-harness loom and follow embroidery patterns. In the laundry they can learn to starch, polish, and sort clean clothes for distribution among the employes. They can do fancy cooking; they can learn to frost cakes and to make candy. In the orchestra they can learn to play the second violin, the cornet and the bass saxophone.

(The next group shown consisted of three girls and five boys. Their chronological ages varied from 13 to 18. Their I. Q. was 60. Their mental age, 9 years. They are in the third grade. They handed in language papers.)

These boys can learn broom-making, the whole process. They can operate a foot-power printing press. They can learn to make scratch pads, block them and cement them. They can do woodwork, where accuracy in following a design is involved. They can do furniture repairing. They can paint toys, games and window sash. They can repair shoes. They can harvest vegetables and fruits. They can make mattresses. They can be garden helpers, especially by cultivating the small vegetables. In the band they can learn to play the alto horn and the drum.

The girls can knit stockings and mittens. They can make baskets, using advanced patterns. They can make cloth toys. They can operate a four-harness loom. They can cut out and make dresses. In the laundry they do fancy ironing; they can learn to use the washing machine and to operate the extractor and the press. They can do plain cooking and can act as waitresses.

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(The third group shown consisted of four girls and four boys, in the third grade. Their chronological ages, from 11 to 19. Their I. Q., 53. Their mental age, 8. They handed in work in division.)

These boys make good fireman's helpers; they can handle coal and ashes, and can clean flues. They can do general cow-barn work. They can pitch and load hay. They can milk. They can act as waiters. They can paint, but only flat work. They make good meat cutter's helpers; they can trim bones and cut meat for stews. They can learn to shave and to cut hair. They can help the carpenter shingle and set glass. They can make toys, wooden animals and checker boards.

The girls can crochet. They can knit sweaters, caps and scarfs. They can do embroidery; make French knots, do buttonhole stitch and cross stitch. They can make baskets, using simple patterns. They can do stencil work. They can dress dolls without help. They can make hooked rugs. They can make dresses that have been cut out by others. In the laundry they can do plain ironing. They make good all-round kitchen helpers.

(The next group consisted of three boys and three girls, who were in the first grade. Their chronological ages ranged from 11 to 16. Their I. Q. was 47. Their mental age was 7 years. They handed in penmanship papers.)

We expect most of the boys and girls in this group to do second-grade work.

A boy of the mental age of seven years can paint farm tools, but he can do no fine work. He can learn to weed small vegetables, like onions and carrots. He can harvest vegetables, except tomatoes, corn and peas. He can drive a two-horse team. He can plow, harrow and cultivate. He can care for horses in the barn. He can sew on buttons and can sew on a patch. He can hoe and thin vegetables. He can help the carpenter by repairing vegetable boxes and he can make brushes.

The girls can knit neckties and scarfs. They can do plain hemstitching. They can cross-stitch. They can learn to operate a sewing machine. They can braid and sew rags for rugs. And they can sweep and dust the employes' rooms.

(The next group consisted of two girls and five boys, whose chronological ages ranged from 10 to 18. Mental age, 6. I. Q., 40. They had penmanship papers. In the first grade.)

Boys of this level can make brushes. They can mow with a hand scythe. They can harness and unharness horses. They can drive one-horse wagons. They can mow lawns. They make good kitchen helpers. They make good mason's helpers. They are all-round ward helpers; they can wax and sweep the floors. They can only do coarse work in weeding; they can do no fine weeding.

The girls can weave rag rugs; they can follow a pattern. They can knit and purl. They can crochet an open mesh. They can do embroidery like the lazy-daisy stitch and the blanket stitch. They make good all-round ward helpers. In the laundry they can hang up and take down clothes.

These boys and girls also represent the so-called hereditary type, as half of them could be so classified.

From now on we go into the second group, the group in which there is considerable somatic disturbance.

The first to be shown are the hydrocephalics.

This young lady on my right is sixteen years old. She was admitted to the institution last March. She was a 7½ months' child. Her head was noticeably large when she was born. In the fall of 1932 she fell and struck her head on the ice. She had concussion of the brain, and there was considerable disturbance which led to convulsions and attacks of severe pain about her head and neck, for

which morphine was necessary to control. Her head has been growing larger throughout the years. When she was fourteen months old her head was 24 inches. When she was five years of age it had reached 27 inches. And when she was fourteen years old it had reached 28 inches. Now, at sixteen years of age, it is 28½ inches. The x-ray shows that there is a large accumulation of the cerebrospinal fluid—it is a case of hydrocephalus—and that the sutures of her skull are still open, which allows the head to continue to expand. Her history states that when she was fourteen years old she was in the fifth grade, but as her head enlarged she has been deteriorating mentally, for the last four or five years. This is shown by the mental level. In 1926 the intelligence quotient was 68; in 1928, 66; in 1934, 54. Her intelligence quotient was taken just a few days ago; it was 34. The x-ray shows a marked flattening at the base of the skull and an erosion of the sella. This is interesting in connection with the fact that she has been very stout around the hips and thighs, indicating a disturbance due to the pituitary gland.

This little boy was born in 1927. He has been with us only a little while. He sits up in bed, but cannot walk. His legs are very stiff. He is a spastic paralytic. He can talk and he has a good time watching the other boys. The size of his head is 26 inches. The family history is good. The rest of his brothers and sisters are normal.

The next little fellow's head is 24 inches in circumference. He is blind, but he walks around and plays in the playroom. He attempts to say a few words, none of which can be understood by me. He was born in 1930, so he is six years old. His mental age is one, and his I. Q. is 20. His father is a refrigerating engineer and a college graduate. The mother spent three years in college. The head expands outwardly and down, making the base of the skull very flat.

The amount of mental deficiency which we find in these cases will, of course, depend upon the amount of damage which has been done to the brain. We have had them all the way from practically zero up.

We had a little boy who died here a number of years ago. He was eleven years old. At our autopsy we secured over a gallon of fluid from the inside of his brain. The cerebral hemispheres were a very thin sac. He knew very little; was about the same as a very young baby.

In this group we can get a large range of mentality, depending upon the amount of damage that has been done to the brain. Of course the ones we see are the ones who are the most damaged.

Weygandt tells us Edison, Schopenhauer, Beethoven, Wagner, Rubenstein, Helmholtz and Menzel were hydrocephalics.

It is surprising how many musicians are in this list.

We will now go to the other end of the scale; that is, from the very large heads, the hydrocephalics, to the very small heads, the microcephalics.

These two girls are unusual because they are apparently identical twins. They are 33 years old. The circumference of their heads is 14¼ inches. That is the size of the head of an ordinary child under a month old. They have been with us for years. The defect was noticed at birth. They have never talked. They can see and hear. They walked at the age of 1½ years. They are exactly alike to all ordinary appearances, but one has a scar on her arm, and when we want to know which is which we look for the scar. Recently I had occasion to measure their bodies, and I noticed that there was quite a little difference in their bodily dimensions.

This boy here belongs to the same group but on a much higher level. He is one of our working boys. He is 40 years old. His job is, for the most part, to pick

up trash around the institution, take it over to the incinerator and see that it is burned up. He is a pretty good boy and we do not have any trouble with him.

Usually these people are rather obstinate and give way to temper tantrums. We had one little boy whose intelligence was way down toward the lower end of the scale. He would get mad, and the only way he could express his temper was to pound his head against the wall and floor and kick with his heels. That was his way of expressing his anger.

This little girl is what is sometimes called pseudo-microcephalic. Her brain has been very much crippled, and she is what we call a spastic paralytic. Her arms and legs are stiff. She has practically no use of them. There is no movement of the arms and legs. This condition is due to a damage to the brain. If the brain does not grow, the skull cannot grow. This girl's brain did not grow, so we have this microcephalic condition. The diameter of her head is 15¼ inches, which is equivalent to that of a normal child two months old, so practically her head has not grown since she was two months old.

The fundamental cause of this condition is germ-plasm injury. There are a number of cases in recent literature in which it was thought necessary to give a woman heavy doses of x-ray. Later on it was discovered that she was pregnant. When the child was born, he was a microcephalic. There have been a number of children born under these conditions who are microcephalic. If you are acquainted with or have read about Morgan and his fruit flies, you see, by disturbing the germ plasm, you can get almost any sort of an individual.

These children represent something different. They are the cretins. They are the ones whose condition is due to an absence or great deficiency in the thyroid secretion.

Our most noted example of this condition is this girl here. She was born in 1885 and came to us in 1896. The record states that she had not grown since she was six months old. At that particular time she was sixteen or eighteen inches tall. She was simply a living mass of flesh. Her tongue was so large she could not get it in her mouth. Her skin was very dry and rough and scaly. Her hair was coarse. In those days we began immediately feeding her thyroid, and we made quite an impression upon her. Eventually she got so she could sit up. Her tongue grew small enough so that she could get it back into her mouth. And she got so she could help herself and help others a little bit. Along about that time her mother came to see "her Jennie"—that is the girl's name. She had not seen her since the time she brought her to the institution. Everyone here was very proud of what had been done for this particular girl. So the matron had Jennie all dressed up and brought her in to show her to her mother. The mother took one look at her and said, "That is not my Jennie." She would not believe it was her girl. She thought something had happened to her girl and that we were trying to palm somebody off on her. She left, and that was the last we ever heard of her. So success sometimes has its difficulties. But you see what Jennie is now. She talks in this way that you have heard. She is now fifty-one years old.

This girl was born in 1896, which makes her forty at the present time. She has been here since 1908. The defect was noticed at birth. She grew very fat quickly. She walked after she was a year old. She sees and hears and helps a little around the ward.

This next little girl over here was born in 1912. Her defect was noticed shortly after birth. The theory was that it was possibly congenital. In 1930 she was 30 inches tall. She was quiet and showed no interest in her surroundings. She is the oldest child in the family. The father is of low mentality. The mother is of low mentality. The first oldest girl after her appears normal. One of her brothers

is here in this institution with us. The next girl is supposed to be borderline. Now, you people who are interested in heredity, there is a case for you. The parents are very indigent. The girl herself walks and talks a little bit. Her head is rather large with a flat top. She has a prominent abdomen, as most cretins do.

There are two types of cretinism. Where the person has never had a thyroid gland, never had any secretion. Where the person has had tumors of the thyroid gland which destroyed the gland's activity, you get the same sort of condition.

This boy on the end represents a goiterous cretin. He has had that goiter most of his life. It has been operated once, was removed, but it grew again. He is forty-four years old. He comes of a rather low-grade family. At least, part of them were low-grade. He has one brother who belongs in an institution of this type. One brother is a college graduate. Some of the others have been in high school.

This next case is something different. From general appearance you would suppose this girl belonged to this particular group, but she does not. This is a case of what we call chondrodystrophia. In the old literature they speak of it as foetal rickets. Something happens before the child is born to disturb the cartilage growth. The consequence is that the epiphyses and diaphyses unite very early so that the child does not grow. The long bones remain very short. Look at the length of that girl's humerus. The femur is the same sort. The sides of the thorax are flattened. See how the sternum projects. Here is one condition where you can make a diagnosis with a yardstick. Measure the child's height and divide it in two. If the half-way point is in the region of the umbilicus, you have a case of chondrodystrophia. This girl has a good time. She can sing and dance.

This condition has no particular connection with the purpose for which this institution was established. They are usually fairly well mentally. The vaudeville stage takes a lot of them. We see them around hotels where theater people associate. Those of you interested in Roman history might like to know that they had a group of gladiators of this type in the early days.

Here are some representatives of one of our most interesting groups. It is interesting because it is one of the most clear-cut clinical groups that we have. They are usually called Mongolians.

In 1866 Dr. Langdon Down, of London, attempted to classify the mentally deficient according to racial types. This group he described and called Mongolians because of the slanted eye slits. In Chinese art the eyes are drawn in this manner. The slanted eye is a quite common characteristic of this group and is the only connection they have with the race of Mongolians. The better term for this condition, I think, would be mongolism, which is used in the German literature. They are found in all countries and among all races including the negro, the Chinese and the Japanese. They are short in stature, have a broad head, frequently have slanted eye slits and a depressed bridge of the nose, the nose is broad, their hands are rather spade-like, and they have very loose joints. You can bend their hands way back without any particular disturbance. I wanted to show you a boy who can sit very comfortably with his heels behind his head, but he has the mumps. They have a fissured tongue. Another characteristic: This fifth finger is much shorter than the other and the second phalanx is much shorter than it should be and it is bent in so, so that when we are sizing these people up we always look for this fifth finger. Their skin is usually rather sensitive, easily irritated, so that we have more or less of a fight to keep the inflammation down. The glands on the edge of their eyelids are very easily irritated, so that most of the time they have sore eyes, which we are everlastingly fighting. They have low resistance to

disease, especially lung disease. Pneumonia in a case of this type is almost a death sentence.

Now, seventy-five percent of these people die before they are twenty-five, but here is a girl fifty-five years old. She has been with us since 1897.

Here is a little girl who has a twin sister here, but the twin is sick so she could not come today. They are identical twins. We have in the literature histories of only seven or eight cases in which both twins are Mongolians, but we have something like eighty or ninety cases in which only one of the twins was a Mongolian.

Another very interesting thing about this type is that very frequently these children have old mothers. In fact, it is said that when a woman thirty-eight years old or older has a child, the chances are about fifty-fifty that it will be a Mongolian. They often appear at the end of large families. This twin belonged to a family where there were twelve pregnancies. These twins are the result of the tenth pregnancy. The mother had her first child when she was twenty and her last child when she was forty-six. She was forty-two years old when the twins were born. She was forty-four when another Mongolian was born. But when she was forty-six she had a normal child. So we can not be sure that the age of the mother will cause this particular condition.

The cause of mongolism still remains a puzzle. In order to figure out the etiology of this condition, here is the thing you have got to put together: The fact that the parents are old. The fact that Mongolians come at the end of large families. And the fact that you can have twins in which only one is a Mongolian. There have been lots of theories and ideas about it. A man in Holland who has written quite a book on the subject claims it is due to pressure on the child before birth; that the amniotic sac is too small; that the baby is bent on itself too much, consequently the center section of its brain does not develop, it is too narrow. But he is the only one that adheres to this idea. The theory held by most of us is that it is some sort of endocrin disorder. Which particular gland, we do not know. We usually protect ourselves by saying it is a polyglandular disorder.

Not long ago one of the medical journals reported two cases in which there were symptoms of thymus enlargement, where the doctor gave what he called "two or three large doses of x-ray." The symptoms of enlarged thymus promptly disappeared. But afterwards these two children showed marked signs of mongolism, which would seem to indicate that the thymus gland has something to do with the production of this condition.

Doctor Breitmann, of Leningrad, in his section on diagnosis in the Handbuch der Inneren Sekretion, has a form of measuring the body. From some five or six thousand measurements that can be made of the human body, he has chosen fifteen. The measurements are made in a perpendicular line from the vertex to the lowest edge of the nose, nose to chin, chin to top of sternum, sternum to mid-mammillary line, mid-mammillary line to umbilicus, umbilicus to groin, groin to knee, knee to ankle, ankle to floor. Also the length of the upper arm, forearm, hand and foot are taken, as well as the half-mammillary distance and the length of the clavicle. He finds that these measurements give him some very characteristic pictures of endocrin disorders. I measured some thirty of our mongols and found some marked physical characteristics of this condition. Particularly, the distance from the inter-mammillary line to the umbilicus is long, and the lower leg is nearly as long as the upper. In plotting these measurements it gives a characteristic picture which resembles quite closely the one Doctor Breitmann gives for dysthymismus. This would seem to indicate that possibly a disorder of the thymus has a good deal to do with this particular condition. We are not the only people

who think so. In Boston they are using Doctor Hanson's thymus extract in the treatment of young mongol children.

Certain things can be done for these people. I have one little boy under treatment with endocrin extracts who has grown twice as fast physically as the ordinary child grows in the same length of time. He has a lot of energy and "pep" and initiative; he is very active; he can always find something to play with. His growth of intelligence is quite marked. A year and a half ago he could say only two words Now he can put together sentences of half-a-dozen words. His attention is very active and scarcely anything escapes him. The fact that he is so full of energy and "pep" means a good deal.

People of this type are usually lazy. If there is a lot of fun to be had they have plenty of energy, but when there is work to be done—such as scrubbing and polishing a floor—that is very laborious and tiresome for them. Henry, here, is a good scrubber. He does a lot of work.

With regard to this last group which I have shown you, in institution practice we expect about four percent of this type. Such boys and girls are only sent here for some specific reason—usually something in the home condition—so that unless there is some specific reason why they should come here we do not get them.

You will find there is no trace of heredity in this group. You will find them in the best regulated and most ambitious and intelligent families. You go to private schools where they are spending a hundred dollars or more a month for their care and you will find many of this particular type of patient, which simply *shows that they come from families that can afford that amount of expense.*

In Russia they form ten percent of the defective population. In our institution, as a rule, they compose four percent. Their mental ages usually range around four years.

It has been only twice that I have seen one who could read. By a great deal of labor you can teach them to read, but it is of no particular use to them. In a short time, unless you keep right after them, they forget it.

The cretins and mongols form our most numerous group of patients whose mental deficiency is due to endocrin disorders. But eunuchoidism is not infrequently found and occasionally dystrophia adiposo-genitalis.

These boys represent the paralytic group whose condition is due to injury of the brain; which paralyzes the body and causes injury to their intellectual powers. They comprise approximately fifteen percent of our population. This paralytic group can be divided into three parts, according to the causes of the condition.

1. Because of birth injury. That is, during birth the head is injured; hemorrhage, usually, of the venous type, which injures the motor regions of the brain and produces this bodily condition.

This young man with crutches is an example of that particular type. His father is a well-known physician. That was his diagnosis. He is twenty-four years old.

The chief characteristic of this paralysis is that it is spastic. The muscles particularly get stiff. If there is a stiffening of the right arm, they hold it in this position (demonstrates). The leg is usually in an extended position, like this. They walk like this. This shows that the injury is in the head, or the upper neuron.

2. Then there is another group, in which the condition seems to be caused by some inflammatory condition. Here meningitis and all the encephalitic conditions come in.

Only one-half of this man's body is affected. He holds his hand in this particular position and he cannot straighten it out because of the paralysis. *His left*

arm and left leg are affected. It is a hemiplegia, a half paralysis or paralysis of one side of the body. That condition is due possibly to meningitis.

3. Here we have the degenerative type.

The boys on the back row are brothers. We had three of them here at one time, all in that condition. This is what we speak of as a paraplegia, paralysis of the legs and lower part of the body. They have this stiff, rigid paralysis. The fact that there are three brothers in this same condition indicates that it is a degenerative disease. Something happens to a tract of fibers in that brain. They deteriorate and put certain mechanisms out of business. That is what happened in this case.

From the motor region in the brain we have a large tract of fibers leading down through the base of the brain into the spinal cord and ending in the cells of the anterior horns of the cord. This is known as the pyramidal tract, and is the tract through which willed movements are made. Any destruction or break in this *tract will cause a loss of willed movements and a paralysis of the spastic or stiff* type.

In the base of the brain we have the basal ganglia, the striate and lenticular nuclei about the third ventricle and in the hypothalamic region. These are connected by fibers with the spinal cord and form what is known as the extrapyramidal system. Its function is motor and controls and directs our automatic movements, the ones we do without thinking. Disturbances in this system produce tics, athetosis, myoclonus, complex repeated movements, torsion spasm and tremors. The muscles are paralyzed, but it is of a waxy not of a spastic type. The face loses its expression and becomes mask-like.

I had one boy that I had selected to illustrate this last group, because I knew his history and knew that the condition was due to encephalitis, but he has the mumps, so I could not bring him over.

This boy is the nearest I have to that condition. You see this shaking. That is involuntary on his part and is due to an injury to one of these basal ganglia (pallidus). It is what we call paralysis agitans or Parkinsonism, and is often caused by encephalitis.

This boy is an early case of that particular disease. He is getting to the point where he is beginning to shake, and it is gradually becoming more marked.

Notice this boy's face. There is a lack of expression and movement there, sort of a masked face. He is losing control of a lot of his automatic motions, motions which we usually make without thinking of them. If he happens to be out of balance he will keep on going backwards until he falls into something. He has had a number of injuries about his head on account of this condition. (Boy is told to rise from chair. Walks backward. Would have fallen if doctor had not caught him.) He simply lost his balance and could not catch it again. He is very helpless when everything is lovely, but if some boy comes along and gives him a "bat" and makes him mad, he can act as well as anybody. He is able to control himself then.

We have, then, the three types of infantile cerebral palsy cases: First, the birth-injury type. Second, the inflammatory, meningitis or encephalitis type. *And, third, the degenerative type.*

Doctor Sharp, of New York, claims that forty-five percent of these cases are of the degenerative type, thirty-five of the inflammatory type, and only twenty percent of the birth-injury type.

The paralytics are a very interesting group and, as I have said, form approximately fifteen percent of our population. In most of them we have a mixture of pyramidal and extrapyramidal symptoms. It is rather unusual to find cases