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JOURNAL OF PSYCHO-ASTHENICS.

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ORIGINAL ARTICLES.

CONTRIBUTION TO THE STUDY OF THE GROWTH OF THE FEEBLE-MINDED IN HEIGHT AND WEIGHT.

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I

A NUMBER of studies have been made in recent years on the growth of normal children in height and weight. Nearly all of these have dealt with school children so that the ages studied have been limited to the school period, six to nineteen years. A large number of children have been measured at one time and the averages calculated from these. The resulting curve of growth probably varies somewhat from that which would be obtained by measuring the same individuals in successive years. Thus the earlier ages will have many who will die. And these are most probably those who vary most from the average or normal. However, it has been pointed out that if the measure of the living and deceased is the same the curve would not be affected by these variants. As to this, however, we have no means of knowing. Another variation is produced by the fact that the poorer parents do not send their children to school as long or as constantly as the more well to do. Also the weaker children are in school longer and are not promoted as fast as their stronger mates.

In the study of the growth of the brain it has been found that it attains its greatest weight soon after the oncoming of puberty, remaining fairly constant to twenty when it begins to decline. This has been explained on the supposition that the individuals that have the heaviest brains must die at about this time.

However, from the large number of individuals that have been measured, the effects of these variants are probably well within the limits of physiological variation.

The results of several of these investigations are given in Table I; and, while the conditions have varied somewhat under which the measurements have been made, yet they exhibit a general uniformity.

The curves of growth platted from the statistics of children in Iowa and Great Britain are shown in Plates I and II. The curves presented are sinuous and of a general parabolic form which indicate variations in the rate of growth and that the growth momentum decreases in continually greater amounts to maturity. In looking at the curves more carefully it will be noticed that the first year is a period of rapid growth in all. Then comes a time of slower growth which lasts until about the age of seven years. Then follows a slight retardation which is again noticed at about ten years. From thirteen to seventeen we again have a period of more rapid growth, indicative of the accession of puberty. A retardation is noticed at eighteen and then the curve gradually flattens out and growth in size practically ceases. Just how long one continues to grow has never been definitely determined. Since most of our statistics are taken from school children they do not extend far enough to show this. However, Baxter studied one million recruits and concluded that growth continues to thirty-four years.

Camara found a slight retardation in growth at the time when the child enters school.

The period of retarded growth preceding the pubertal increase President Hall interprets as indicating a period of maturity in our forebears.

Byer in his study of the West Point cadets found retarded growth in height at eighteen years. Other studies have shown morbidity to be high at this period.

In comparing the growth of the boys and girls we find that the curves diverge rapidly during the first year to run parallel to nearly eleven years, the boys being both taller and heavier than the girls during this period. At eleven the girls begin to grow in height and exceed the boys, which advantage they maintain until about fifteen years when they are again exceeded by the boys, who continue to grow in height much longer than the girls. The development of girls is much slower after fifteen than before.

The curves of weight show the same general features except that the girls exceed in weight one year later than in height. Girls also grow in weight longer than in height.

The overlapping of the curves from eleven to fifteen years Smedley found to be due to slower growth on the part of the boys and increased growth on the part of the girls. West has found that this overlapping is less among the more favored ones. And Boas remarks that if many of retarded growth die at puberty then we would have an explanation of this overlapping of the curves. But observation so far has tended to show that while puberty is a period of great morbidity yet the mortality is low.

A number of conditions have been found which produce variations in the curve of growth. Thus the condition of the mother has a determining influence for Gassner found that the weight of the child at birth was 5.23%

TABLE I

	IOWA				CHICAGO				BOSTON								WORCESTER				GR. BRITAIN			
	BOYS		GIRLS		BOYS		GIRLS		BOYS				GIRLS				BOYS		GIRLS		BOYS		GIRLS	
	M. V.	WT.	M. V.	WT.	HT.	WT.	HT.	WT.	HT.	WT.	N. L.	L.	HT.	WT.	N. L.	L.	HT.	WT.	HT.	WT.	HT.	WT.	HT.	WT.
9	1.7	20.80	3.6	18.87	1107	19.74	1097	18.87	1058	18.60	1059	1048	18.39	17.19			1097	19.32	1074	18.06	495	3.22	489	3.13
3	2.8	23.32	36	21.51	1158	21.61	1154	20.97	1121	20.44	1121	1099	20.02	19.56			1127	30.87	1113	19.82	851	(10.89)	698	9.12
1	2.2	24.95	41	23.13	1209	23.82	1205	23.01	1175	22.19	1163	1154	21.73	21.39			1170	22.41	1175	21.77	854	14.74	819	11.48
6	2.5	27.95	39	26.35	1261	26.34	1252	25.26	1222	24.34	1218	1206	23.94	23.50			1223	24.31	1216	23.36	931	15.42	918	14.33
7	2.9	28.90	52	28.17	1309	28.71	1301	27.80	1271	26.86	1275	1252	25.74	25.11			1270	27.13	1266	26.04	978	16.78	971	16.38
1	4.1	32.84	63	31.39	1351	31.22	1354	30.66	1325	29.58	1313	1303	28.92	28.11			1340	30.16	1328	28.80	1042	18.14	1031	17.78
4	3.7	35.47	57	36.15	1395	34.15	1413	34.37	1368	31.60	1364	1357	30.85	30.16			1388	32.21	1370	31.75	1118	20.14	1090	19.05
2	3.6	41.21	73	42.68	1455	38.08	1477	38.97	1421	32.57	1427	1415	36.37	35.16			1429	35.74	1447	36.15	1168	22.68	1130	21.55
1	5.5	46.26	53	45.36	1519	42.70	1536	44.22	1477	36.46	1474	1421	45.09	44.42			1476	39.05	1479	39.78	1194	24.95	1183	23.63
6	5.0	53.07	43	50.48	1581	47.99	1568	48.16	1538	37.83	1491	1474	41.13	47.68			1543	44.54	1537	47.63	1261	27.40	1236	25.17
9	6.9	58.97	36	50.63	1640	51.24	1583	50.65	1658	42.49	1532	1521	45.09	47.68			1622	50.89	1570	47.63	1312	30.62	1295	28.12
6	7.4	63.56	44	54.88	1679	57.38	1593	52.39	1681	58.16	1573	1555	48.85	51.07			1658	56.06	1584	49.44	1359	32.66	1348	30.89
3	4.8	64.67	39	56.92	1712	61.29	1594	52.92	1694	59.69	1582	1563	50.44	52.23			1685	60.42	1591	54.43	1397	34.93	1404	34.65
4	5.7	65.99	38	57.33								1574	52.49	51.23			1700	64.68	1593	53.52	1441	37.65	1464	39.55
	4.8		5.7									1568	52.54				1713		1590	54.34	1505	41.75	1518	44.00
																	1739		1592	53.43	1578	46.72	1546	48.22
																	1705				1632	53.98	1566	51.30
																					1680	59.42	1587	52.39
																					1702	62.32	1584	54.93
																					1708	63.50	1591	56.25
																					1714	65.00	1600	55.97
																					1717	65.86	1600	55.33
																					1719	67.13	1598	55.97
																					1714	67.13	1600	56.29
																					1719	67.13	1592	54.88

eight. WT.—Weight. M. V.—Mean Variation. N. L.—Non-Laboring. L.—Laboring. Weights are in Kgms. Heights given in M. M.

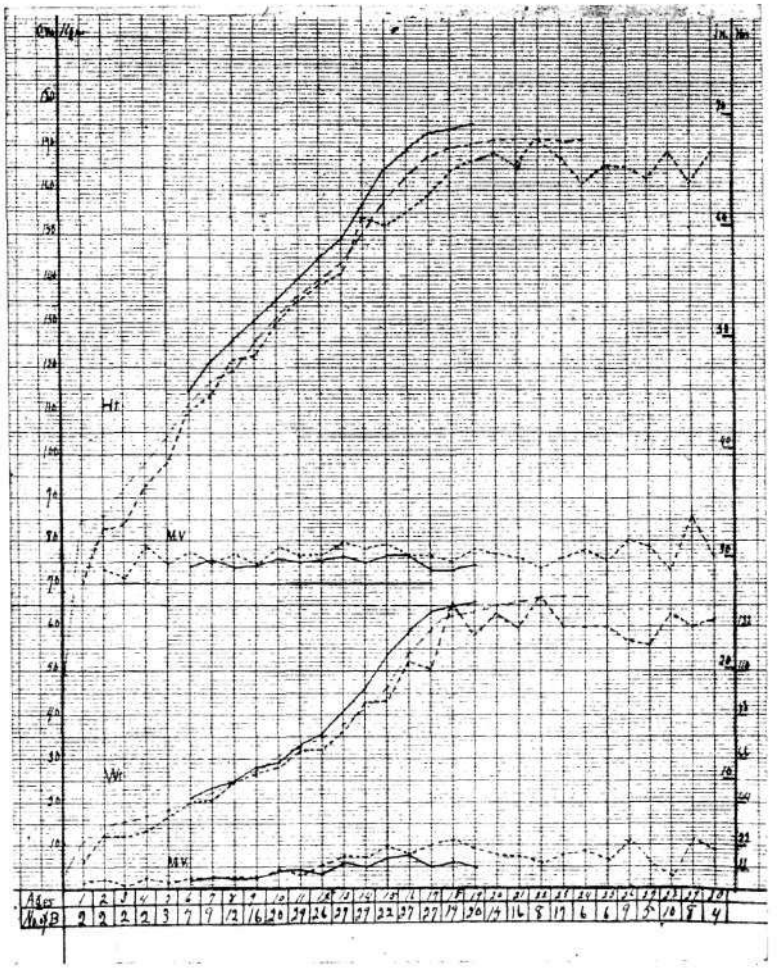

PLATE I. Height and Weight of Boys. ——Iowa School Children. – – – English School Children. - - - - Feeble-Minded Children.

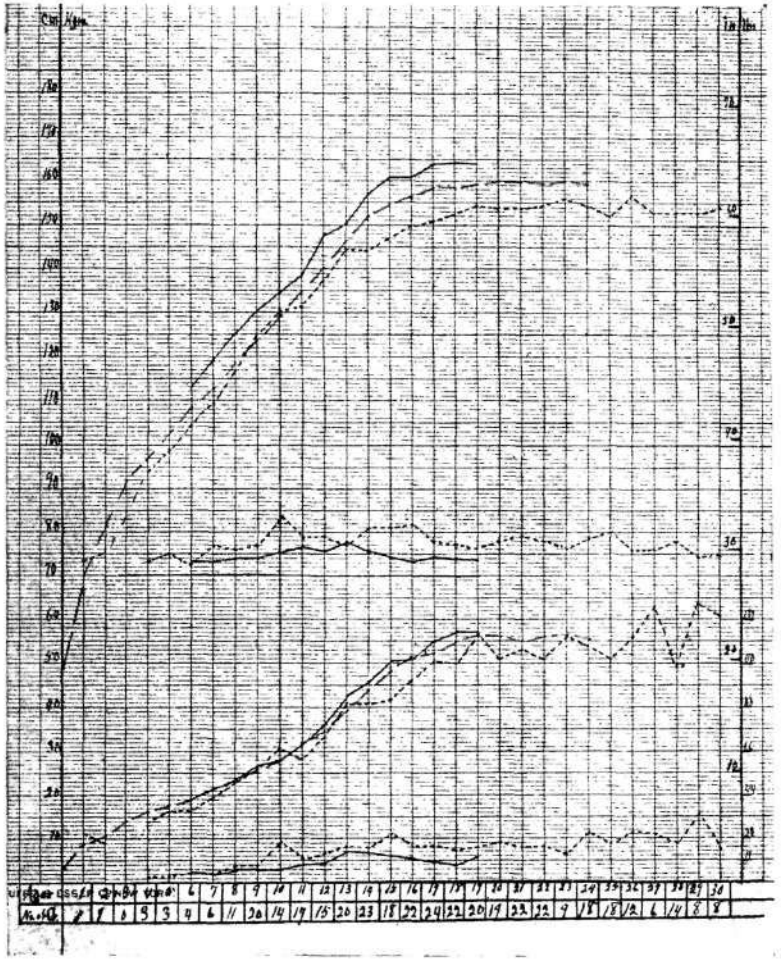

PLATE II. Height and Weight of Boys. ——Iowa School Children.
– – – Eng'ish School Children. - - - - Feeble-Minded Children.

of the mother's weight.

The effect of the sociological condition is marked. MacDonald finds that the children of non-laboring parents are greater in height and weight than those of laboring parents. Galton finds that in Great Britain the poorer boys are shorter and lighter. And this has been found to be true wherever the question has been studied. Key finds that growth is more sudden in the poor and occurs two years later than with the well to do. MacDonald also finds that the pubertal superiority of the girls is one year longer among the laboring.

Maling-Hanson, in a careful and minute study of the growth of a number of deaf school children, concluded that defective food retards growth, but more in weight than in height, and when they grow in height they do not in weight and *vice versa*.

Growth in size and function are found to be in inverse ratio to each other. Hereditary disease is early shown by decreased growth in height. Boas found that the first born exceed the later born in height and that this fact is independent of nationality.

As to the growth of the mentally dull or deficient child the results in the main agree. Porter found that the dull child was lighter and the precocious child heavier than the average. But the rate of growth in all from seven to sixteen was the same and the prepubertal acceleration was the same. Beyer found also that the dull child is the small child. Smedley from his measurements of Chicago school children concludes that dull and below grade pupils are below the average in height and weight only from ten years on. Kline who made a study of truants found them smaller than the average and homologous to the savage.

II.

Some three years ago the author made a study of the growth in height and weight of the children in the Minnesota School between the ages of one and twenty-five years*. The number of the children in some of the age groups being very small it was thought good to repeat the measurements to see if a larger number of children would change the essential features of the growth curve as then determined. So one hundred and eighty-nine of the children appear twice in this study and these were situated along the age scale as it appeared in 1899 as follows:

Age	Boys	Girls	Age	Boys	Girls
3	1		9	2	5
4	0	0	10	6	5
5	2	2	11	6	6
6	3	2	12	3	3
7	3	3	13	9	3
8	3	3	14	11	7

*Wylie: Investigation concerning the Weight and Height of Feeble-Minded Children. JOURNAL OF PSYCHO-ASTHENICS. December, 1899.

15	4	6	20	4	5
16	6	5	21	2	10
17	6	7	22	2	7
18	8	6	23	4	3
19	4	8	24	1	3
				92	97

The measurements of the children were taken in their ordinary school dress and are given in Table II. And the curves platted from these are shown in Plates I and II.

For the averages for normal children we have taken the figures given by Gilbert in his studies on Iowa school children since the conditions under which the measurements were made were similar in both. But since these data are only of limited range, extending from six to nineteen years, we have also drawn in the curve taken from the figures in Robert's table of the height and weights of English children. The difference between this curve and that of the feeble-minded for height is too small owing to the different conditions of the measurements.

On consulting Plates I and II one notices that the curves of growth of the feeble-minded children are more angular or not so smooth as those of normal children. This is most probably partly due to the small number of feeble-minded children upon which the observations are based, and partly to the nature of the material studied, observation of the individuals plainly indicate this.

In studying the height curve of the boys one notices that it is everywhere below the normal. During the second year the feeble-minded boys grow more rapidly than the normal boys, but this is plainly due to loss during the first year and is indicative of delayed development. This is followed by retardation during the third year. From three to six the curve gradually approximates more closely to the normal. From six to eleven the curve runs fairly parallel to the normal except during the ninth year where there is a marked retardation. From eleven on the general tendency of the curve is away from the normal. More particularly there is a sharp rise in the curve during the fourteenth year which thrusts it very close to the normal. It then falls quickly away showing a marked retardation; and gradually rises to the twentieth year, but much less rapidly than the normal. After twenty the general level of the curve is somewhat lower although there are marked irregularities. Thus it will be noticed that periods of rapid growth are followed by marked retardation, indicating a quick exhaustion of the growth impulse, which is only slowly and in part made up later on.

The general features of the curve of weight are the same as those of the height curve. During the first six years it deviates in much the same manner from the normal. It approximates somewhat more closely the normal from six to eleven years. There is a period of marked growth during the second year and periods of retardation in the third, seventh and twelfth years. The pubertal increment is noticed in the thirteenth and fourteenth years. There is marked retardation in the fifteenth and seventeenth years

TABLE II

	WEIGHT						HEIGHT					
	BOYS			GIRLS			BOYS			GIRLS		
AGES	NO.	W. B.	M. V.	NO. G.	W. G.	M. V.	AGES	NO.	H. B.	M. V.	NO. G.	H. G.	M. V.
1	2	6.260	1.15	1	10.340		1	1	700		1	734	
2	2	12.61	2.78	1	9.300		2	2	828	35	1	752	
3	2	12.150	.51				3	2	839	13			
4	2	13.600	2.50	3	14.153	1.270	4	2	931	86	3	939	36
5	3	16.647	1.32	3	16.238	1.50	5	3	979	44	3	992	48
6	7	20.038	2.13	4	16.600	2.22	6	7	1089	76	3	1036	26
7	9	20.184	2.43	6	19.504	1.86	7	9	1136	47	6	1095	66
8	12	24.862	2.77	11	22.634	3.90	8	12	1217	67	10	1168	61
9	16	26.399	2.68	20	25.854	4.04	9	16	1231	48	19	1248	69
10	20	28.304	4.36	11	30.799	8.94	10	18	1303	87	12	1305	135
11	29	31.700	3.13	17	28.257	5.63	11	29	1351	64	15	1315	87
12	26	31.978	5.17	15	33.875	6.35	12	24	1393	64	15	1374	91
13	27	39.406	7.44	20	40.187	8.50	13	27	1414	95	19	1443	70
14	29	43.601	7.20	23	40.777	8.17	14	28	1539	82	20	1442	104
15	22	43.636	9.71	18	41.140	11.02	15	20	1522	91	16	1471	110
16	27	52.118	8.35	22	45.859	8.55	16	27	1550	64	21	1497	113
17	27	50.439	9.84	24	50.394	8.48	17	27	1590	65	24	1506	81
18	19	65.499	10.93	22	50.258	7.26	18	18	1644	52	20	1525	71
19	20	57.741	8.04	20	56.790	8.17	19	20	1665	79	20	1545	64
20	15	62.641	6.72	19	51.437	9.30	20	15	1684	69	18	1538	78
21	16	59.693	7.39	22	53.161	8.26	21	16	1657	60	22	1537	91
22	8	66.860	6.17	22	51.165	8.26	22	8	1718	35	22	1544	79
23	17	59.556	7.76	9	56.004	6.31	23	16	1681	58	9	1558	61
24	6	59.920	8.62	18	54.295	11.20	24	6	1613	80	18	1546	84
25	6	60.146	6.35	18	51.618	8.89	25	6	1657	56	18	1522	102
26	9	56.744	10.76	12	56.245	11.34	26	9	1653	102	12	1566	59
27	5	56.290	6.12	6	63.095	11.16	27	15	1630	87	6	1528	61
28	10	62.823	2.86	14	48.635	8.85	28	10	1690	31	14	1528	79
29	8	60.146	11.16	8	64.229	15.38	29	8	1621	155	8	1528	45
30	4	61.326	9.17	8	61.054	7.39	30	4	1691	66	8	1541	48

NO.—Number of Boys.
NO. G.—Number of Girls.
W. B.—Weight of Boys.
W. G.—Weight of Girls.
H. B.—Height of Boys.
M. V.—Mean Variation.
Weights are in Kgms.
H. G.—Height of Girls.
Heights given in M. M.

followed by rapid growth in the sixteenth and eighteenth years. And the general tendency of the curve after twenty is away from the normal.

In comparing the two curves of height and weight from fourteen on we find in these children confirmation of the fact already noted among normal children that increase in weight succeeds that in height.

In the height curve for girls we have the same general features as that for boys except that it continues to approach the normal until ten years, after which there is a more marked delay. The pubertal increment is here noted in the twelfth and thirteenth years with subsequent delay in the fourteenth. The curve then slowly rises to nineteen years and continues on the same general level to thirty years.

The weight curve follows in the main that of height. It, however, crosses the normal at ten years, but immediately recrosses and remains sub-normal during the rest of its course. The pubertal increment is noticed during the twelfth and thirteenth years. There are marked depressions during the eleventh, fourteenth, fifteenth and eighteenth years. The general level is somewhat lower after twenty with a strong tendency to rise in the late twenties. Growth in weight follows that in height the same as with the boys.

This study and those made upon normal children are based upon averages. The average weight and height for the children at the various ages have been calculated. While as yet the definition of normal has not been clearly calculated the only one we are now able to give is that the normal is the average. Other studies also point in this direction. Beyer finds that the results of the battle of life point to the average of the race as the goal to strive for. Large men are sick longer and die earlier, and middle sized men are found to stand more in the army.

However, the simple average is often unsatisfactory. It applies very well in many cases but when applied to animate things it leaves something to be desired. Adaptability and consequent variability are the chief characteristics of the animate. So when dealing with things of the animate world we need in addition to the average some indication of the average variability in order to have something truly accurate and full of meaning. And this is true in a larger sense when we are dealing with abnormal things, for here the chief characteristic is the wide variation.

The average gives the value of a series, but gives no indication of the uniformity of the series from which it is derived. So in order to do this it has become the custom to calculate also the average variation from the determined average or the mean variation. Thus the greater the mean variation the rougher the series from which the average is deduced. As applied to series taken from animate things it would give an index of the average or normal variation.

In most of the studies made in height and weight the authors have been contented to calculate the simple average. Gilbert however has computed the average variation. He finds it largest at the times of fastest growth. It increases to puberty and decreases afterward. Before puberty it is about the same in boys and girls. It is greatest for girls from eleven to fourteen years, at all other times the boys exceed the girls.

The curves of mean variation are shown in Plates I and II in comparison

with those given by Gilbert. For height the curve of mean variation exceeds that of normal children except in two or three instances. In general the mean variation is greatest at times of fastest growth, but there are many marked exceptions to the rule. The ten and fifteen year points are noticeably high. The curve is markedly high in the post-pubertal epoch, in fact the greatest variation appears here.

The curve of mean variation for weight shows the same general features as that of height except that it is nearer normal up to ten years. High points are noticed at ten and fifteen years. The post-pubertal epoch is markedly high. The points of delay in the growth curve are as a rule points of high variation.

In Plates III and IV we have drawn the maximum and minimum curves of height and weight determined by adding to and subtracting from the average for each age the mean variation for that age. The normal curves are determined by treating the statistics of Gilbert in the same way. These plates show some very interesting results. In general the average for the feeble-minded follows fairly closely the minimum of the normal children, and the maximum of the feeble-minded children the average of the normal children. After puberty there is a marked falling off in the curves of the feeble-minded children so that their maximum approaches more closely the minimum of the normal children. The special features noticed when treating of the average curves are also accentuated in these drawings. The ten year point is especially noticeable, also the pubertal increase and the subsequent delay.

CONCLUSIONS

I. The feeble-minded are subnormal in height and weight. The average of the feeble-minded approximates the minimum of the normal and the maximum of the feeble-minded the average of the normal.

II. The feeble-minded child most closely approximates the normal in height and weight at ten years. This is due to delay on the part of the normal child and increased growth on the part of the feeble-minded following a delayed development in the earlier years.

III. Development is delayed among the feeble-minded. This is especially noticed in the early years and in later adolescence. Puberty is delayed which in part explains the depressions in the curves at fifteen years.

IV. Growth of the feeble-minded is not continuous. Rapid growth is followed by delay. This indicates weakness of growing power which is quickly exhausted and is only made up slowly, but only in part, hence:

V. Growth power is deficient among the feeble-minded. This is noticed especially at fifteen years and in the post-pubertal epoch.

VI. High mean variation is characteristic of the feeble-minded, indicating weak growing power and delayed development.

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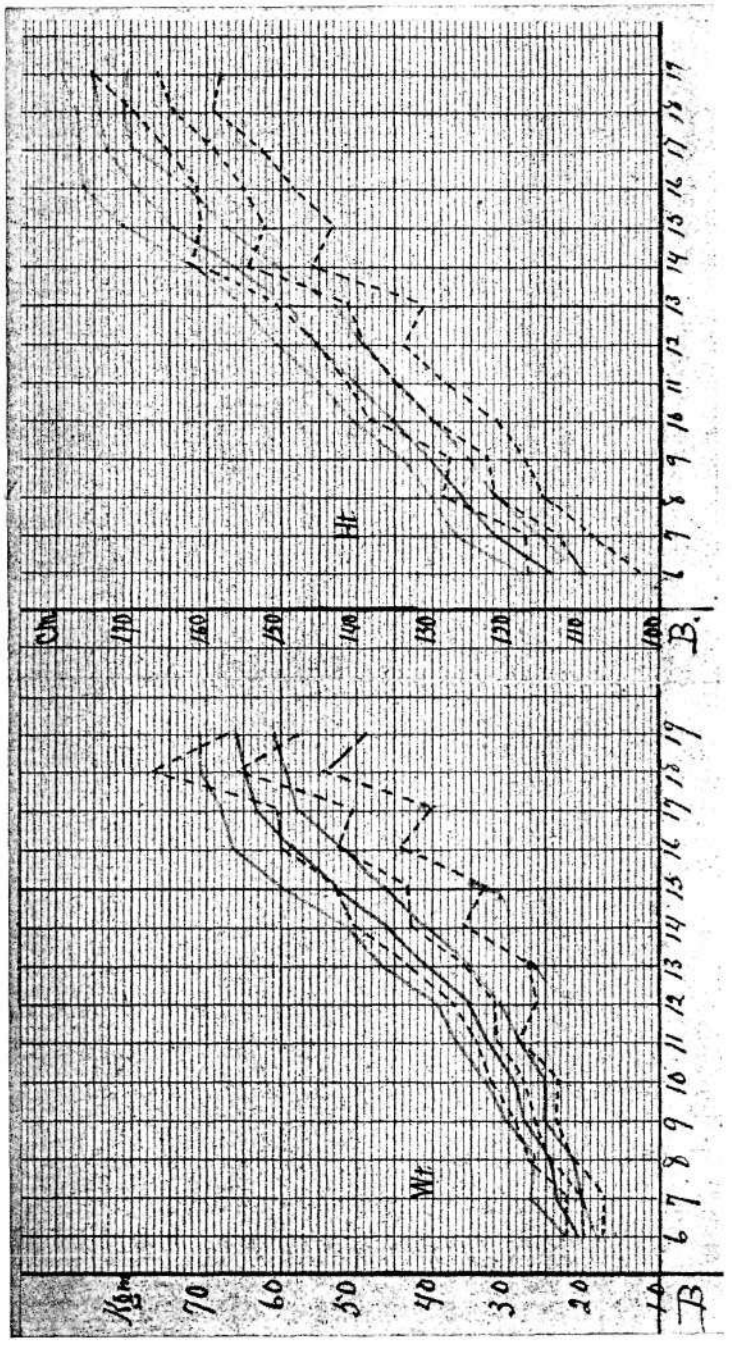

PLATE III. Maximum and Minimum Weights and Heights of Boys. —— Iowa School Children. - - - - Feeble-Minded Children.

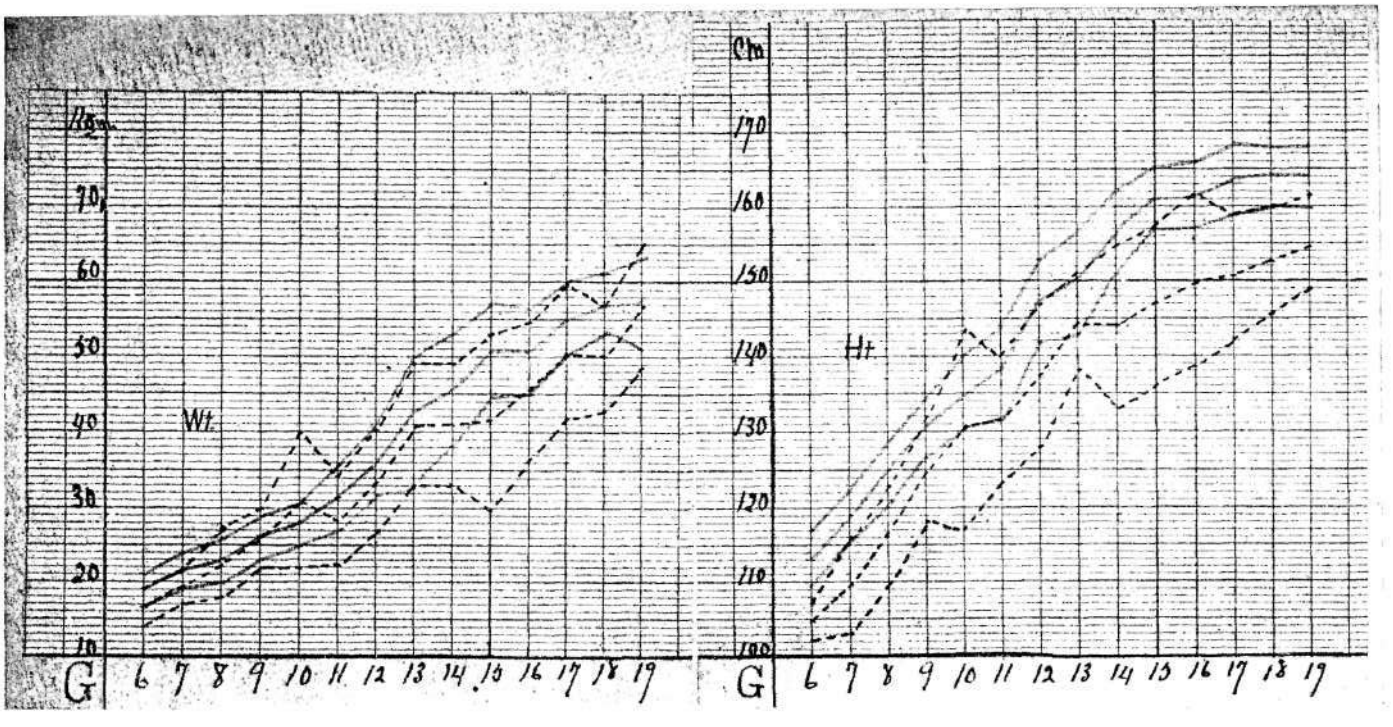

PLATE IV. Maximum and Minimum Weights and Heights of Girls. —— Iowa School Children. - - - - Feeble-Minded Children.

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DISCUSSION

Dr. Murdoch: We are to be congratulated on this able paper which Dr. Wylie has taken so much pains in preparing and I will invite Dr. Grosseman to open the discussion.

Dr. Grosseman: This is a valuable study of the abnormal child in comparison with the normal child. I have under my observation several cases which seem to contradict some of the statements. I have noticed two tendencies in the matter of growth, one in the direction of smaller growth and the other tendency toward giantism. The smaller growth is usually found in children of a very nervous tendency, choreatic, with very slow growth up to fourteen. Then there are children with a tendency for giantism. I remember one boy who came at fifteen who within a year grew six inches in height and gained twenty-five pounds in weight. At that time he became incorrigible in my institution, developed thieving propensities and sexual difficulties so that he could not be handled by me. He showed a peculiar condition of mentality and was an exceedingly dull fellow generally. Another case was that of a girl not particularly large for her age. She has been with me nearly five months. During three of those five she did not grow very much, but she has gained ten and one-eighth pounds. She is slow and very nervous. The child is as yet a problem to me. These two tendencies have come under my observation,—retarded growth and giantism.

Dr. Murdoch: We had a boy who stood still in growth for three years,

but this year he has shot up and I believe he has grown a foot.

Mr. Johnstone: I was taught that at the age of growth children's mentality was less than when the physical body was quiescent, but I do not believe it. I find that in many cases when there is the most physical growth, mentality is brightened considerably.

Dr. Murdoch: That has been my observation, that the physical and mental growth were concomitant.

Mr. Johnstone: This paper is a valuable contribution, but I do not think the writer has had cases enough to form an average. Wouldn't it be possible for our institutions to furnish him data to carry on these studies? He is trying to establish the normal by establishing the abnormal. I think Dr. Rogers may make some sort of an arrangement for us. In our institution there would be some one glad to get the data to turn over to him. I think we should do it. I move that we ask Dr. Rogers to confer with Dr. Wylie and let us know what data he would like to have us send. The motion was seconded and adopted.

INDUSTRIAL TRAINING—ITS PLACE IN SCHOOLS FOR THE FEEBLE-MINDED

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THE first thought we give a child when it enters our school, is: What can this child be taught to do that will be of the most use to himself, and to the institution when he becomes a man in years? Is he strong? Does he need physical development more than mental? What advantages has he had, and what will he be able to do five, ten, or even twenty years from now?

There are a great many occupations that come under the head of industrial training, but it is the more ordinary branches of which I wish to speak. Farming comes first, and why shouldn't it? It is the most natural work in the world, and seems closest to the hearts of our children. It is not strange that feeble-minded children have a special liking for it. Under the head of farming come horticulture, dairying, poultry raising, teaming, etc., and I can safely say that four-fifths succeed along this line in comparison with the number that undertake other trades, the natural trend of this class of defectives being in the direction of the farm. But few choose to be painters or carpenters, and still fewer have any desire to make shoes, or do housework. With the girls housework, and particularly the care of their small and helpless companions, holds the same place that farming does with the boys. However, I am inclined to believe that farm, or garden work, has its attraction for the girls almost equal to that of the boys. Girls should have their little gardens and be allowed to do these things for recreation if nothing else. We say a man or woman should have a fairly good education to do any of

these well, or at least should have good common-sense. There is no doubt that common-sense goes much farther than education. However, that does not alter the fact that we must educate along the line of work we expect the child to perform in order to become self-supporting in later years. Understand I do not mean self-directing. The sad side of it all is that feeble-minded children have neither common sense nor education. These qualities being lacking, we have to study or learn the child, and then work along the lines of least resistance, and almost invariably these lines are in the direction of one of the above named trades or industries. I think I am safe in making the statement that the salvation of all institutions for this class of children hinges *alone* on industrial training. Certainly their often disputed right to exist will best be shown by the results obtained through it. *All* education must point to one end,—there is absolutely no other. The possible exception may prove the rule. As a rule, farmers' and artisans' boys do not get the years of schooling that the lawyers', doctors', or ministers' children do, so we say we will teach our children such and such a trade, and give them as good an education as is reasonable to expect, but the end for which we are training must never be lost sight of.

The carpenter or dressmaker does not have to know Latin or Greek in order to make a dress or build a fence, but they have to know the use of a tape measure or a square; however, we have boys today who are practically doing a man's work and yet cannnot write their own names. It is not the ordinary person who learns a profession, but the extraordinary person. About seventy-five per cent of the people living to-day are the people who do manual labor. We haven't a child in our institution who would become self-supporting in any other way but as a result of manual training, and no child has ever gone out from here that could begin to make his living in any other way. We cannot expect our children to learn a dozen different occupations and be proficient in each. In nearly all cases we must confine the child to one special trade, and quite often to one special branch of that trade. The boy who handles the pick and spade may become a machine and do the work of a man in just that line. If we have plenty of such work for that boy, then he is saving us just so much of a man's time. He then becomes of use to us and to himself. It may be as mechanical as a clock; nevertheless, the results are there. Without sufficient work of this character at hand, we must make for him an industrial opportunity suitable to his capacity.

If we should cut out industrial training, alas, there would be nothing substantial left. The Kindergarten, manual training, fancy needle-work, etc., amount to nothing in themselves. We might keep our children at that a life-time, but what advantage would there be in the end? We must make the Kindergarten train for the carpenter, painter, farmer, blacksmith, shoemaker, etc. Why, there is no end to the training in even the simple blocks—houses, barns, fences, churches, and a hundred and one other things, are built. Thus the child is being trained for the carpenter. The next step above the Kindergarten is the manual training, then follows the industry, and he is made an artisan.

From manual training to industrial usefulness is the short road along which one of our boys coming under my close observation has traveled, and