THE AVERAGE HEIGHT AND WEIGHT OF ENGLISH SCHOOL CHILDREN.

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THE accompanying tables show the average height and weight of a number of English school children inspected during 1909 and 1910, and were compiled from figures kindly supplied to us by school medical officers in response to a circular letter which we sent out early in the year. We asked for the number of children examined of each sex and age, with the sum of their heights in centimetres and of their weights in kilograms. The form for reply was composed of slips which enabled us to make our calculations direct from the figures sent to us.

We received a large number of replies, and were very sorry not to be able to avail ourselves of many of the figures sent, as a number of school medical officers forwarded their own averages, and the returns of others were not comparable with the majority of the figures received on account of variations either in the amount of clothing worn by the children when measured or in the method adopted for classifying the measurements afterwards.

We decided to confine our calculations to those returns in which the total heights and weights were given of

children measured and weighed in ordinary indoor clothing and without boots, and as only one such return was received from Wales it was omitted in order that the present calculation should refer only to English children.

The actual figures from which our averages are derived represent measurements of 583,640 children, and were received from seventeen county and forty-four urban education areas scattered throughout England, and we believe that, taken together, they are fairly representative of the country as a whole. Totals for 1909 only were received from seven districts, for 1910 only from fourteen, and for both years from forty. We combined the figures for the two years, and worked out separate averages for the county and urban areas as well as for the North and South of England, the line of demarcation adopted being one following the southern borders of Salop, Staffordshire, Leicestershire, Rutland, and Lincolnshire.

The averages representing the North of England are derived from the figures of nine county and twenty-six urban areas; those for the South of England from the figures of eight county and eighteen urban areas. We were constrained in a few instances to exclude figures that were obviously incorrect, and our results give the average height and weight for each age and sex of those children whose measurements were included in the totals we made use of.

As we do not know whether or not the children were evenly distributed through each year of age, we cannot claim that these averages represent the true mean heights and weights of English school children, though we think that the curves on the accompanying chart demonstrate that fairly approximate averages have been obtained.

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Boys.

Age last Birth-day.	England.			County Education Areas.			Urban Education Areas.			North of England.			South of England.		
	No.	Height.	Weight.	No.	Height.	Weight.	No.	Height.	Weight.	No.	Height.	Weight.	No.	Height.	Weight.
3	9,388	Cm. 92.4	Kilos. 14.86	5,793	Cm. 93.1	Kilos. 14.93	3,595	Cm. 91.3	Kilos. 14.74	5,628	Cm. 92.4	Kilos. 14.86	3,760	Cm. 92.5	Kilos. 14.95
4	24,047	98.2	16.29	12,898	98.5	15.44	11,149	97.7	16.10	14,062	98.0	16.36	9,985	98.4	16.18
5	65,438	103.0	17.54	32,390	103.2	17.71	33,048	102.7	17.34	43,070	102.6	17.54	22,368	103.7	17.53
6	20,554	108.0	19.33	9,469	108.6	19.35	11,085	107.5	19.31	13,038	107.7	19.49	7,516	108.6	19.04
7	37,515	114.7	21.20	14,784	115.3	21.47	22,731	114.3	21.01	17,271	114.1	21.17	20,244	115.2	21.22
8	9,684	119.3	22.86	1,940	119.5	23.30	7,744	119.0	22.75	3,719	118.3	22.62	5,965	120.0	23.01
9	7,873	124.7	25.12	2,699	126.6	25.86	5,174	123.7	24.73	4,330	125.4	25.46	3,543	123.8	24.71
10	21,579	129.4	27.42	8,234	130.0	27.75	13,345	129.1	27.22	16,447	129.3	27.46	5,132	129.8	27.31
11	5,084	134.2	29.93	1,775	135.2	30.78	3,309	133.7	29.47	2,531	134.0	30.17	2,553	134.5	29.69
12	37,230	139.8	33.05	25,933	140.2	33.31	11,297	138.9	32.45	20,601	139.4	32.89	16,629	140.2	33.24
13	52,232	142.5	35.15	21,632	142.6	35.32	30,600	142.4	35.03	30,649	141.5	34.89	21,583	143.8	35.52
14	4,342	147.1	38.15	1,381	147.8	38.34	2,961	146.8	38.06	2,340	145.5	37.45	2,002	149.0	38.97

Girls.

Age last Birth-day.	England.			County Education Areas.			Urban Education Areas.			North of England.			South of England.		
	No.	Height.	Weight.	No.	Height.	Weight.	No.	Height.	Weight.	No.	Height.	Weight.	No.	Height.	Weight.
3	8,478	Cm. 91.6	Kilos. 14.44	5,343	Cm. 91.9	Kilos. 14.52	3,135	Cm. 90.9	Kilos. 14.29	5,256	Cm. 91.5	Kilos. 14.46	3,222	Cm. 91.7	Kilos. 14.40
4	21,362	98.1	15.82	11,695	99.2	15.92	9,667	96.7	15.69	12,874	97.8	15.82	8,488	98.6	15.82
5	63,825	102.6	17.07	31,464	103.1	17.22	32,361	102.0	16.92	42,189	101.9	16.98	21,636	103.8	17.25
6	21,238	107.6	18.58	10,101	108.0	18.74	11,137	107.2	18.44	13,686	107.0	18.52	7,552	108.6	18.70
7	36,477	113.9	20.50	14,570	114.6	20.64	21,907	113.4	20.40	17,261	112.9	20.46	19,216	114.8	20.53
8	12,014	117.6	22.19	4,639	117.8	22.22	7,375	117.5	22.18	6,342	117.2	22.09	5,672	118.1	22.31
9	8,138	123.7	24.75	2,886	125.6	25.10	5,252	122.6	24.56	4,578	124.2	24.93	3,560	122.9	24.52
10	21,017	129.8	28.71	8,126	130.2	26.94	12,891	129.4	26.57	15,278	129.2	26.59	5,739	131.1	27.03
11	5,129	133.5	29.59	1,913	135.6	30.31	3,216	132.3	29.16	2,634	133.6	29.59	2,495	133.4	29.59
12	36,577	138.7	33.51	24,909	138.5	33.84	11,668	139.3	32.79	20,607	138.7	33.25	15,970	138.8	33.84
13	50,717	144.5	36.31	21,771	145.1	36.79	28,946	144.0	35.94	28,854	143.7	36.08	21,863	145.6	36.60
14	3,702	149.0	39.81	1,269	149.8	40.12	2,433	148.7	39.65	2,035	147.7	39.00	1,667	150.7	40.79

The most marked irregularity in these curves is the elevation at age 12 in the boys' height curve and in both the boys' and girls' weight curve; this, we think, is probably due to the fact that children leaving school are more likely to be inspected towards the end than the beginning of their twelfth year, and the averages for this year are probably greater than the true mean.

The elevations in both height curves at age 7 and in the girls' height curve at age 10 are not accompanied by any corresponding deflection of the weight curves, and we are unable to account for them. We constructed curves for the subsidiary areas and found that, generally, those for the urban areas were the most regular, those for the county areas being least so.

In comparing the averages for county and urban areas, it should be borne in mind that the areas of many county education authorities have a considerable urban population. The county averages are, with one exception, better than those for urban districts.

The averages for the South of England are, on the whole, better than those for the North, particularly at the

The two upper lines represent heights, the two lower lines weights. Boys ———; girls - - - -

later ages, though the differences between these two sets of averages are not so marked as between those of the county and urban areas.

The height and weight of girls are a little less than those of boys until the eleventh and twelfth years, when the relative positions become reversed. The greater development of girls at these ages is most marked in the South country averages.

We should like to take this opportunity of pointing out and apologizing for two errors in the printing of the tables we have already sent to those school medical officers who assisted us with their returns. They refer to the weight of North of England boys aged 5, and North of England girls aged 3; the correct averages are given in these tables.

THE DIAGNOSTIC VALUE OF RACHICENTESIS.

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THE method of performing rachicentesis is simple. The patient should lie on one side or the other. To perform rachicentesis with the patient sitting is to incur grave risk. His hips should be close to the edge of the bed, his trunk well flexed. This position widens the space between the spinous processes of the vertebrae, renders tense the ligamentum subflavum, and raises the lower end of the spinal cord. The site of puncture is determined by the position of the fourth lumbar spine, which is crossed by a line dropped perpendicularly from the highest point of the iliac crest to the bed. The needle may be introduced in the mid-line or slightly to one side in the second or the third intervertebral space or just to the side of the spine of the corresponding vertebra. The spot selected is marked and the skin rubbed with lysol solution (1 in 20), and then with pure chloroform. The use of liquid carbolic acid or of pure lysol endangers the local vitality. The needle is passed steadily in with a slight

inclination upwards. There is resistance at the skin and at the ligamentum subflavum; after the latter is pierced the needle is liable to plunge if too great force be used; the subarachnoid space (from which the fluid is drawn) is generally 5 cm. from the entrance wound. When this is reached the cerebro-spinal fluid usually appears. If it do not come the needle should be turned round once or twice in case fibres of the ligament be blocking the point. If the needle strike bone it must be withdrawn 2 cm. and reintroduced in another direction. If the point have touched a small vessel the first portion of the fluid may be bloodstained. This contamination is inevitable if the skin have been incised before introducing the needle. The amount of fluid removed varies, but 10 to 12 c.cm. is a convenient quantity; it is allowed to drop from the end of the needle into a sterile test tube. During its escape the colour and pulse of the patient must be watched; any sign of collapse requires instant stoppage of the withdrawal and the administration of oxygen. In any case the flow should be stopped from time to time by a sterile swab if the needle have no stopcock. In a case of cerebral tumour there is very real danger in removing the fluid too freely or too rapidly. The puncture is sealed with collodion. The patient should lie flat for some hours afterwards.

The fluid should be examined without delay. The rate of flow is noted at the time. About 5 c.cm. of the fluid are centrifugalized for ten minutes, the supernatant fluid poured off, and the deposit transferred to a sterile slide. When dry this film is fixed and stained with methylene blue or other stain.

Normal cerebro-spinal fluid is clear, colourless, and alkaline; the degree of alkalinity seems to vary, but the significance of this is not known. It becomes slightly turbid when boiled; it reduces Fehling's solution, glucose being present in the proportion of 0.4 to 0.5 per cent. The glucose may disappear when meningitis develops. The fluid may become coloured. Yellow fluid may indicate tuberculous or chronic meningitis, or tumour of the spinal cord; in subdural haemorrhage or cerebral laceration it is red, but if the trauma be some days old the colour may be dark amber. Red colour may be due to accidental contamination; coagulation in the test tube is stated to be an infallible sign of this, but such a conclusion is not always justifiable. It has been asserted that bile does not appear in the fluid in cases of jaundice; one of the cases described contradicts this. Turbidity is an indication of meningitis, but the fluid may be clear in sub-acute tuberculous meningitis. It is clear also in extradural haemorrhage and in cerebral tumour.

A film made from normal cerebro spinal fluid contains very few leucocytes, and many fields may be examined before one corpuscle is found. Absence of leucocytes excludes meningeal inflammation, locomotor ataxy, and superficial gumma of the brain. It does not exclude cerebral abscess unaccompanied by meningitis; this shows the value of making a leucocyte count of the blood at the time the cerebro-spinal fluid is examined.

In pathological states the number of leucocytes is increased, and in inflammatory conditions a varying number of endothelial cells may be seen. The variety of leucocyte which becomes the more abundant depends on the lesion. It is probable, however, that the explanation of the predominance of the one variety over the other lies in the fact that the inflammatory change is of a less active type, demanding fewer phagocytes.

The significance of the actual changes will now be considered:

1. Lymphocytosis generally means a chronic meningitis, and is found when the cause is syphilis or tubercle (the latter especially in children), in locomotor ataxy, in epilepsy, and in general paralysis of the insane. It is said to occur in acute parotitis and in herpes. Some cases of cerebral glioma have shown this lymphocytosis. It is absent during the initial stage of tuberculous meningitis. Development of lymphocytosis in the course of a disease means improvement, and in those cases of non-tuberculous meningitis which have recovered the number of lymphocytes has steadily increased.

2. A polymorphonuclear leucocytosis generally means acute meningeal disease. It is found during the initial stage of tuberculous meningitis, but is often persistent in this disease in adults. In cerebro-spinal meningitis it is present from the beginning, and is increased at each